
















VOLUME  
LXXV

JULY & DEC  
1898

# THE BUILDER

 N : ILLUSTRATED : WEEKLY  
MAGAZINE : FOR : THE  
ARCHITECT : ENGINEER : ARCHÆ-  
OLOGIST : CONSTRUCTOR : SANI-  
TARY-REFORMER : & : ART-LOVER.

CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.



"EVERY man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kind of private principedom, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned." ♦ ♦ ♦ ♦ ♦

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON. ♦ ♦ ♦ ♦ ♦

"OUR English word To BUILD is the Anglo-Saxon Bylsan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"ALWAYS be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE. ♦ ♦ ♦ ♦ ♦

OFFICE: 26, CATHERINE-ST., COVENT-GARDEN, LONDON, W.C.





*Printed at*  
*74-75, Great Queen Street, Lincoln's Inn Fields*  
*London, W.C.*



## INDEX TO VOLUME LXXV.

JULY TO DECEMBER, 1898.

## CONTENTS.

Articles, Notes, and Reviews .. .. .	iii	Correspondence : Writers of Letters .. .. .	viii
Reports of Meetings, Papers Read, Law Cases, &c. .. .. .	v	General .. .. .	viii
Correspondence : .. .. .		Architects, &c., of Buildings Illustrated .. .. .	xi
Subjects of Letters .. .. .	vii	Illustrations .. .. .	xi

## ARTICLES, NOTES, AND REVIEWS.

- ABBEY, Tintern, 9  
 Abbey Mansions, Westminster, 3, 264, 298, 313  
 Academy, Royal (*see* 'Royal')  
 Acanthus Column, Delhi, 331  
 'Accident,' a Railway, 400  
 Accident: Gt. Central Railway, 358; the Wellington, 226; the Westminster Building, 2, 264, 298, 313  
 Acetylene Exhibition: Earl's Court, 75; Imperial Institute, 264  
 Advertisement Pest on the Continent, 205  
 Aldbrough, Sanitary State of, 147  
 Alnwick, Sanitary State of, 246  
 Alphand, M., Monument to, 75  
 Altar, St. Mary's, Chaddesden, Derby, 230  
 Aluminum, 183  
 American Architectural School, an, 51; Sculpture, 128; View of Church Architecture, 150  
 Anglo-Indian Architecture, 358, 378  
 Antiquities, Egyptian, University Coll., 59  
 Archbishop's Palace, Canterbury, 600  
 Architect, Obliteration of the, 265  
 Architects: a Religious Guild for, 402; 'a Remarkable Strike of,' 577; and Competition Committee, 576  
 Architects' Charges, Institute Scale of, 3  
 Architects' Use of Books, the, 320  
 Architectural Assoc.: Conversation, 378; Excursion Sketches, 128; Lectures, 107  
 Architectural: Design, Modern, 330; Inscriptions and Insignia, 202; Scholarship, a Duban, 321; School, an American, 51; Societies, French, 6  
 Architecture: Among the Poets, 59; Anglo-Indian, 358, 378; at the Royal Academy, 5, 33, 53; Church, American View of, 250; Elementary, 212; French Mediaeval, 399; Later Renaissance, in England, 57; London Street, 200, 208, 266, 285; Mogul, of Fathpur Sikri, 221  
 Architecture of our Large Provincial Towns: Belfast, 445, 458; Dundee, 139, 150; Glasgow, 21, 31, 59, 153, 185; Newcastle-on-Tyne, 303, 316  
 Ardchattan, Argyllshire, 52  
 Ardennes, States of the, 72  
 Argentine Republic, Building in the, 201  
 Art of England, the, 59  
 'Art Union' Engraving, the 186  
 Artisan, 186  
 Artists, French and English, at the Mansion House, 95  
 Arts and Crafts, Central School of, 31  
 Artistic, Lunatic, Banbury, 153  
 Athens, British School at, 599  
 BACTERIA in Crude Sewage, 245  
 Baluster Shafts, Saxon, 407  
 Balzac, Proposed Monument to, 56  
 Barracks, &c., Plymouth, 204  
 Bas-reliefs, Decorative, 508  
 Baths, Walthamstow Public, 246  
 Belfast, Wexleyan University Hall, 312  
 Blashill, Mr., Retirement of, 378  
 Bell-towers, Lincolnshire, Capitals in, 117  
 'Bertolini's', St. Martin's Street, Leicester, 186  
 Betwys-y-Coed, Sanitary State of, 147  
 Birmingham: Archl. Assoc., 478; Health Exhibn., 316, 323; Water Famine, 283  
 Bishopsgate, Wesleyan University Hall, 312  
 Blashill, Mr., Retirement of, 378  
 Blue Coat School, Westminster, 54  
 Bodicaea Statue, the, 424  
 Board of Trade Report on Strikes, 473  
 Books, Magazines, Pamphlets, &c.: notices, reviews, and articles as to (continued):  
 Annual, British School at Athens, 599  
 Ansell, H., Manufacture of Glazed Bricks, &c., 212  
 Antiquary, 33, 171, 272, 340, 429, 528  
 Architectural Record, 170, 429  
 Antiquary Review, 33, 231, 340, 528  
 Arnold's Scale Drawing Sheets, 233  
 Art Journal, 33, 170, 231, 340, 429, 528  
 Artista, 33, 170, 231, 340, 429, 528  
 Belcher, J., and Mervyn E. Macartney, Later Renaissance Architecture in England, 57  
 Beven, T., The Law of Employers' Liability & Workmen's Compensation, 127  
 Boulton, H. P., Municipal and Sanitary Engineers' Handbook, 128  
 Brinton, Selwyn, The Renaissance in Italian Art, 213  
 Buckmaster, M., Elementary Architecture, 212  
 Building Trades Directory, 39  
 Burr, E. A. P., Guide to Round Timber Cubing Rule, &c., 435  
 Byrne, Austin T., Inspection of Materials and Workmanship, 435  
 Canon, the: the Pagan Mystery Perpetuated in the Cabala, as the Rule of all the Arts, 281  
 Catalogue, Northern Art Workers' Guild, Manchester, 426  
 Century, 33, 171, 231, 340, 429, 528  
 Chemistry in Daily Life, 435  
 Contemporary Review, 341, 528  
 Daniel, A. E., London Riverside Churches, 126  
 Day, Lewis F., Windows, Stained and Painted, 261  
 Deamer, P., Walls, 434  
 Deutsche Kunst und Dekoration, 340  
 Diaries, &c., for 1899, 586  
 Directories, New, 59, 197, 624  
 Earthquake, the Hereford, 109  
 Edwards, P. J., History of London Street Improvements, 184  
 Electrical Installation Rules, 435  
 Eldon, J. V., Applied Geology, 273  
 Engineering Magazine, 33, 171, 340, 429, 528  
 English Illustrated Magazine, 341  
 Ennis Review, 171, 340, 429, 528  
 Exhibits, Illustrated Prize, Sanitary Institute Exhibitions, 233  
 Farrow, F. R.: Fire-resisting Floors in London, 57; Specifications for Building Works, 58, 157  
 Fortnightly Review, 528  
 French Wood-carving from National Museums, 241  
 Gazette des Beaux Arts, 231, 340, 429  
 Gentleman's Magazine, 171, 231  
 Gerhard, W. P., Sanitary Engineering, 128  
 Graham, Cunningham, 'The Canon,' 281  
 Grenfell, B. P., and A. S. Hunt, the Oxyrhynchus Papyri, 273  
 Guilds, London, the G.E.R., 15  
 Guildhall, London, a Guide to the, 127  
 Henderson, R., and R. P. Wright, the Young Estate Manager's Guide, 233  
 Hutton, W. H., Hamilton Court, 213  
 Illustrated Topographical Record of London, 170  
 Indian and Eastern Engineer, 529  
 Books, Magazines, Pamphlets, &c.: notices, reviews, and articles as to (continued):  
 Jarvis, J. W., and W. J. Woods, My Home & Household Compendium, 127  
 Journal of the Sanitary Institute, 233  
 Kelly's Directory of Building Trades, 39  
 Kendrick, A. F., Lincoln Cathedral, 272  
 Kerr, R., Wireless Telegraphy, 233  
 King René's Honeycomb Cabinet, 436  
 Kingzett, C. T., and D. Homfray, Pocket Dictionary of Hygiene, 435  
 Knowledge, 341  
 Langham, A. W. F., and A. Whillier, Arnold's Scale Drawing Sheets, 233  
 Lassar-Cohn, Dr., Chemistry in Daily Life, 435  
 Latham, F., Sanitation of Domestic Buildings, 435  
 Law, E., Hampton Court, 213  
 London Manual, the, 39  
 Magazine of Art, 33, 170, 231, 340, 429, 528  
 Magazines and Reviews, 33, 170, 231, 340, 429, 528  
 Maycock, W. P., Electric Wiring and Fitting Details, 233  
 Maxwell, W. H., Removal and Disposal of Town Refuse, 224  
 Miller, F., Training of a Craftsman, 57  
 Minton-Senhouse, R. M., and G. F. Emery, Workmen's Compensation, 49  
 Moore, Colonel E. C. S., Sanitary Engineering, 597  
 Morris, W., Address on Art, 127  
 National Review, 33  
 Nineteenth Century, 33, 232, 340, 528  
 Northern Art Workers' Guild, Manchester: Catalogue, 426  
 Oxyrhynchus Papyri, 273  
 Pall Mall Magazine, 33, 171, 232, 340, 529  
 Perry, C. C., French Technical Education, 1  
 Portfolio of Indian Architectural Drawings, 221  
 Post Office London Directory, 604  
 Quarry, 232, 529  
 Quarterly Review, 171, 428  
 Quennell, C. H. B., Norwich Cathedral, 58  
 Railway Officials, Directory of, 197  
 Reads, T. M., and F. Holland, The Phyllades of the Ardennes, and the slates of North Wales, 272  
 Renaissance, the, 528  
 Rideal, Samuel, Disinfecting and Disinfectants, 421  
 Robinson, J. R., The Princely Chandos, 528  
 Routledge, C. F., Church of St. Martin, Canterbury, 91  
 Rowe, E., French Woodcarving, 241  
 Ruskin, J., The Art of England and the Pleasures of England, 59; The Stones of Venice, 58  
 Sachs, E. O., Stage Construction, 71  
 Sanitary Engineering, 597  
 Sanitary Institute Exhibitions: Illustrated Prize Exhibits, 233  
 Scottish Woodwork of the Sixteenth and Seventeenth Centuries, 109  
 Scribner's Magazine, 232, 340, 429, 528  
 Scrutton, P. E., Electricity in Town and Country Houses, 127  
 Seddon, J. P., King René's Honeycomb Cabinet, 436  
 Statham, H. H., Architecture among the Poets, 59  
 Books, Magazines, Pamphlets, &c.: notices, reviews, and articles as to (continued):  
 Strand Magazine, 171  
 Street Improvements, History of London, 184  
 Stubbs, Dean, Ely Cathedral, 127  
 Studio, 33, 231, 340, 429, 528  
 Sweeting, W. D., Peterborough Cathedral, 58  
 Temple Bar, 232  
 Tourists' Guide, the G.E.R., 15  
 Trade Catalogues, 59, 213, 233, 273, 436, 606  
 Waring, G. E., jun., Street Cleaning, 128  
 Watts, W. W., Geology, 273  
 Webb, Sidney and Beatrice, Problems of Modern Industry, 93  
 Webber, F. C., Carpentry & Joinery, 435  
 Wells, Commander L., Manual of Fire Drill, 127  
 Workmen's Compensation, 122  
 Books Received, 12, 39, 59, 60, 102, 128, 152, 174, 194, 213, 254, 298, 320, 347, 366, 387, 413, 436, 464, 487, 509, 533, 564, 586, 606  
 Books, the Architect's Use of, 520  
 Boundary-street Scheme, the L.C.C., 94  
 Brabazon, H., Drawings by, 474  
 Bradford Play, the, 3  
 Bradford: Ecclesiastical Art Exhibition, 281; Fire Station Competition, 576  
 Bricks, &c., Glazed, Manufacture of, 212  
 Bricks, Pumice, 147  
 Bridge House Estates, Finsbury-circus and London-wall, 278  
 Bridge, New Kew, 358; over the Keltney Burn, 250  
 Brisbane, 163  
 Bristol, Colston's Hall, 378, 573  
 British Association Meeting, 245, 251  
 British School at Athens, 599  
 Bronze Charlotte of Delhi, 3  
 Brook Hospital Expenditure, the, 358  
 Building Act, London, & Party Walls, 477  
 Building: in the Argentine Republic, 201; Regulations in the Country, 377; Stones, Sycney, 600; Structures, Varnish, &c., used in, 380  
 Buildings: for the Paris Exhibition, 167; in Hurricane Countries, 453; Restrictive Covenants as to, 167  
 Burne-Jones, the late Sir E., Works by, 53, 95  
 Bury Public Water Service, 95  
 Bute House Estate, Finsbury, 521  
 CABINET, King René's Honeycomb, 436  
 Calculus, Standard Buildings, 358, 364, 378  
 California University Competition, 358, 366  
 Camborne, Sanitary State of, 122  
 Candle, the Nest Electric, 282  
 Catalogue: Archbishop's Palace, 600; Church of St. Martin's, 91  
 Capitals in Lincolnshire Bell Towers, 117  
 Carnarvon Water Supply, 204  
 Carnarvon Museum, Paris, 4  
 Carpentry and Joinery, 435  
 Cartoon of a Draped Figure, 606  
 Castle, Taunton, 283  
 Catalogue, Northern Art Guild, 426  
 Catalogues, Trade, 59, 213, 233, 273, 436, 606  
 Cathedral: St. Colman's, Queenstown, 212; St. Patrick's, Dublin, 8  
 Cement Testing, Portland, 328  
 Cemetery Competition: Horsham, 185; Salford, 577  
 Central London Railway, 385



## ARTICLES, NOTES, AND REVIEWS

(continued):—

- Chalk, Water Supply from the, 545  
 Chapel: Giggleswick School, 239; Memorial, Rue, Jean-Goujon, Paris, 1041; Private, Matlock, 386  
 Charges, Institute of Architects Scale of, 3  
 Charing Cross road, St. Mary's the Virgin, 186  
 Chariotier, Bronze, of Delphi, 3  
 Chavannes, Pavis de, 379, 433, 483  
 Chelsea: the Physic Garden, 147; 577; Vestry Report, 265  
 Chemical Examination of Mortar, 244  
 Chemistry in Daily Life, 435  
 Church: Barnoldswick, 342; Barnsley, 342; Canterbury, St. Martin's, 97; Chaddesden, 230; Charing Cross-road (London), 186; Devonport, 651; Dundee, 484; Enfield, 270; Kilpeck, 321; Lincoln's Inn Fields (St. Anselm and St. Cecilia), 357; Llangynydd, 254; London, 74, 121, 186, 375, 494, 508; Mansfield, 528; Moorfields (London), 424; Moss Side, Manchester, 342; Newcastle-on-Tyne, 271; Nottingham, 485; Paris, 521; Southsea, 211; Southwark (London), 74; Strand (London), 121; Tadcaster, 289; Westminster, 203; York, 249  
 Church: Architecture, an American View of, 150; Design for a Timber, 61; West End of a Town, 558  
 Church, Prof., on Houses of Parliament Frescoes, 30  
 Churches, London Riverside, 126  
 Cistern and Tank Construction, 307  
 City Electric Lighting in the, 52  
 City and Guilds Institute, 453  
 Claypale, Sanitary State of, 122  
 Clement's Inn, Rebuilding, 272  
 Clergyman, an, on Sewage Disposal, 226  
 Clerkenwell, No. 41, Mount Pleasant, 125  
 Clock Face, St. Paul's Cathedral, 283  
 Club, Village, Strawberry, 272  
 Cluny Museum, Paris, 246  
 Colchester Town Hall, 354, 384  
 Collection and Disposal of Refuse, 224  
 Colossal Additions, Reading, 220  
 Colston's Hall, Bristol, 378, 573  
 Commercial Education, 520  
 Communication, Railway Passenger, 50; 547  
 Como Electrical Exhibition, 146  
 Companies, Municipal Officers and, 547  
 Compensation to Workmen, 494, 712, 122, 127, 312, 477, 503  
 Competition: a German Model, 41; California University, 358, 385; Colston's Hall, Bristol, 378, 573; East Ham Public Buildings, 315; for Shop Frontages, Plymouth, 52; Godalming Municipal Buildings, 379; Godalming Workhouse, 423; Hortham Cemetery Chapel, 185; Liverpool Royal Institution, 501; Salford Cemetery, 577; Singapore Town Hall, 427; Walthamstow Baths, 246; Wolverhampton Workhouse, 400; Worcester Hop Market Hotel, 478  
 Competition Committee, Architects &, 576  
 Competition for Prix de Rome, Paris, 122  
 Competitions of Schools of Art, 120  
 Compulsion and Sanitary Work, 400  
 Concert Rooms at Colston's Hall, Bristol, 573  
 Congress of French Architects, 6  
 Constantinople, Illustrations of, 521  
 Construction, Inspection of Materials, &c., for, 435  
 Continent, Advertisement Set on the, 205  
 Continental Towns, the Picturesque of, 300  
 Contractor, how to become Successful, 165  
 Conversion: a, Architectural Association, 379  
 King's College, 31  
 Converters, Rectifying, 413  
 Corcoran, M., on Medieval Architecture, 399  
 Cottage, Rickmansworth, 152  
 County Council, and Antiquities, 312  
 42; Boundary-street House, 54; Parliament-street Improvements, 520; the Works Department, 74, 547  
 Crofton Water Supply, 283  
 Crypt, Glasgow Cathedral, 288  
 Crystal Palace Company, New, 371  
 DANGERS of Hot-water Heating Apparatus, 375  
 Decoration: for Room, Walsingham House, 386; Mosaic, Great Church, Byewater, 524; Mural, Design for, 660; of Marie, Vincennes, 4, 501; of the Pantheon, Paris, 168  
 Decorative Paintings, Designs for, 342  
 Deir-el-Bahri: Illustrations of, 408; Temple of, 121  
 Delphi: Acropolis Column at, 331; Bronze Charioteer of, 3; Discoveries at, 371  
 Design, Modern Architectural, 330  
 Designs by Sir E. L. Burre-Jones, 95  
 Destruction of Ancient Houses, 33  
 Diaries for 1899, 586  
 Dictionary of Hygiene, Pocket, 435  
 Dining-room: a, Loudon, 433; the Palace, Darmstadt, 558  
 Dinner, Institute of Architects', 547  
 Directories, New, 39, 197, 604  
 Discoloured Statue, the, 289  
 Disinfecting Stations, 421  
 Domestic Buildings, Sanitation of, 93  
 Doors, Choir, Tadcaster Church, 289  
 Doorway, St. Helen's, Bishopsgate, 171  
 Downways, Queen-square, London, 126  
 Dover Harbour Works, 493  
 Drain or Sewer, 50  
 Draped Figure, Cartoon of, a, 656  
 Drapers' Hall, Finsbury-market-street, 332  
 Drawings: by Pavis de Chavannes, 487; 'Prix de Rome' Prize, 211; Unclaimed, 257, 259; (see also Exhibitions)  
 Drought and Water Supply, 312  
 Drummond Chapel, Innerpeffery, 185  
 Dublin Architectural Scholarship, 332  
 Dublin: Lord Jeseph's Gift to, 599; St. Patrick's Cathedral, 8  
 Ducal Palace, Venice, 576  
 Dudley Gallery Exhibitions, 284, 454  
 Dundee, Architecture of, 139, 150  
 Dundee Institute of Architects, 185, 217  
 Dundee Exhibition, 521  
 Dwellings, Workmen's, and the L.C.C., 500  
 EARL'S COURT: Acetylene at, 75; Exhibition at, 75  
 East Ham Public Bldgs. Competition, 315  
 Ecclesiastical Art Exhibition, Bradford, 284  
 Edinburgh, Tooting in, 265  
 Education: Commercial, 520; Technical and Elementary, 547  
 Education and Art, a Minister of, 120  
 Egypt Exploration Fund, 121, 452  
 Egyptian Antiquities at University Coll., 50  
 Eiffel Tower, Making the Best of the, 423  
 Eight Hours' Day Experiment, 246  
 Electric: Candles, the, 282; Engraving Mechanism, 500; Lighting in London, 52, 75; Power Scheme, Tesla's, 453; Railway for Paris, 75; Railways, Magnetic Action of, 245; Traction at Hamburg, 577; Traction, Drawbacks of, 52; Traction on the Underground, 477; Traction, London, 312  
 Electrical: Exhibition, 500, 146; Installation Rules, 453; Nomenclature, 303; Light, of Power, 400  
 Electricity: at Home, 575; in Town and Country Houses, 127; on the Underground Railways, 95; Wood Seasoning, 29, 520  
 Elevator, a Remo Inclined, 121  
 Ely Cathedral, 127  
 Employed, a, in the, 121  
 Ely in Quarries, 74; Parliamentary Council, 576  
 Engineering, Sanitary, Progress of, 577  
 England, the Art of, 59  
 Engraving: Mechanism, a Novel Electric, 500; Revived Wood, 521; the 'Art' House, 521  
 Engravings, Stipple and Mezotint, 52  
 Estate Manager's Guide, the Young, 233  
 Estates, Sales of: Archdeacon, 52; Whitton Park, Hounslow, 95  
 Estates, the Bridge House, L.C.C., 378  
 Exhibition: Acetylene, Earl's Court, 75; Acetylene, Imperial Institute, 264; Arts and Crafts, Manchester, 404; at Messrs. Boussois & Valadon's Gallery, 424; at Messrs. Dowdeswell's, 522; at Messrs. McLean's Gallery, 494, 578; at Messrs. Holford & Son's, 522; at the Dudley Gallery, 484, 454; at the Dutch Gallery, 521; Home and Household Compendium, 127; the Grafton Gallery, 379; at the Modern Gallery, 479; at the New Gallery, 330; Brabazon, H., Drawings by, 444; of the R. R. Oil Drawings, by 454; Burne-Jones's Works at Christie's, 53; Central School of Arts and Crafts, 31; of the R. R. Oil Drawings, by 454; Egyptian Antiquities, University College, 50; Electrical, 500, 146; Finsbury, 332; H. J. Worrie, 471; Glasgow, Studies by Mr. Furniss, 31; Goodwin, A., Works by, 578; Guildhall Loan, 320; H. J. Worrie, 471; H. J. Worrie, 471; Lithographic, 246, 478; Mr. Oliver Hall, 424; Minor, London, 321; Minor, Paris, 321; Morocco, Views in, 321; of Mr. Falgout's Works, 421; of Fine Art Society, 31, 52, 494, 454, 522, 578; of Institute of Painters in Oil Colours, 423; of London Sketch Club, 379; New English Art Club, 454; of Society of British Artists, 402; of Society of Painter Etchers, 424; of Society of Painters in Water Colours, 522; of Society of Portrait Painters, 379; Omdurman Paintings, 578; Paris 1900, 146, 167, 184, 205, 277, 529, 576, 621; Photographic, Dudley Gallery, 283; Pictures by W. B. Tholen, 321; Rookwood Pottery, 522; Royal Academy Students' Designs, 545; Schools of Art, Students' Work, 120; Sculpture, New York, 2; Société Internationale, Paris, 483; South Kensington, Silvermiths', 284; Stipple and Mezotint Engravings, 52; Turner's Company, 379; Wood Engraving, 521; Woodville, C., Omdurman Paintings by, 578  
 Explosion at Earl's Court, 75  
 FALGOUT, M., Works by, 479  
 Fathpur Sikri, Mogul Architecture of, 221  
 Fine Art Society Exhibitions, 31, 53, 404, 454, 522, 578  
 Finales, Buttress, Woolpit Church, 183  
 Finsbury, H. J., Picture by, 479  
 Finsbury Circus, Bridge House Estate, 378  
 Finsbury-pavement, Topography of, 421  
 Fire: Drill, Manual, 127; in New York, 321; Resisting Materials, Tests of, 321; Tests, Scaghill, 121; the Sunderland, 74  
 Fire, London, Attendance at, 4  
 Fire-street, Notable House in, 4, 600  
 Fires: Fire-resisting, in London, 59  
 Florence and the Ponte Vecchio, 509, 583  
 Fontainebleau, the Palace of, 454  
 Forbes, Prof. G., on Electrical Transmission of Power, 500  
 Fort, Roman, at Saalburg, 265  
 France: Preservation of Monuments in, 121; Technical Education in, 1  
 Free Labour Association, National, 53  
 French: Architects, Congress of, 6; Architectural Society, 6; Medieval Architecture, 399; Picture at the Guildhall, 32; Wood-carving, 241  
 French and English Artists at the Mansion House, 67  
 Frescoes, the Houses of Parliament, 30  
 Furniss, Mr., Studies by, of Gladstone, 31  
 Furniture, Seventeenth-century, 380  
 GERMAN: Model Competition, 4; Post Office Buildings, 265  
 Gladstone: Memorial, the Proposed, 94; Goodwin, Mr., Exhibition by, 578  
 Gateway Tower, R.A. Design for, 508  
 Gen. v. Vestry of St. Mary, Newington, 500  
 German: Model Competition, 4; Post Office Buildings, 265  
 Gladstone: Memorial, the Proposed, 94; Goodwin, Mr., Exhibition by, 578  
 Glasgow: Architectural Craftsman's Soc., 265; Architecture of, 21, 24, 65, 153, 185, 205; Height of Buildings in, 454  
 Glass: Bricks, &c., Manufacture of, 212  
 Godalming Municipal Bldgs., 379, 433, 483  
 Golders Hill, Hampstead, 400  
 Goodwin, Mr., Exhibition by, 578  
 Goupil Gallery, Pictures at the, 332, 522  
 Government House, Rangoon, 432  
 Government Offices, the New, 50, 94  
 Grafton Gallery Exhibition, 379  
 Great St. Ann's, Old Houses in, 521  
 Great Central Railway Co., 354, 423  
 Great St. Ann's, Old Houses in, 521  
 Greek Sculpture, Late, an Example of, 185  
 Guild, Religious, for Architects, 401  
 Guildhall, Cambridge, 212  
 Guildhall, London, Guide to the, 127; London Exhibition, 32  
 HACKNEY Sanitary State of, 185  
 Hamburg: Electric Traction at, 577; Town Hall, 249  
 Hampstead: Golders Hill, 400; Heath, 332; Sketches of, 52  
 Hampton Court: History of, 213; Water Gallery, 31  
 Hampton Court and Wolsey's Leaden Palace, 21  
 Handicraft, Lambeth Guild of, 604  
 Harbour Work, Dover, 423  
 Harbours, the Widenings of, 453  
 Health, Medical Officers of, 147  
 Heat, Sound, Light, &c. (See each issue)  
 Heating Apparatus, Hot Water, Dangers  
 Height of Buildings in Glasgow, 454  
 Henderson, A. E., on St. Sophia, Constantinople, 121  
 'Hertford House', Manchester-square, 146  
 High Building Policy, Paris, 227  
 Highgate Archway, 227  
 Hortham Workhouse Competition, 423  
 Hills, H. F., on Mortar, 244  
 Hobbs, Hart, & Co., D. Grover, 477  
 Holford & Son, Architects, 167  
 Holford & Son, Architects, 167  
 Home: Convalescent, Design for, 386; Electricity at, 575  
 Home and Household Compendium, 127  
 Hopkinson, Dr. John, 226  
 Hortham Cemetery Chapel Competition, 185  
 Horton Asylum, 74  
 Hospital: Brighton, &c., 558; St. John's Wood, 364; the Brook, 358  
 Hotel: Bude, Cornwall, 61; Gorse-ton-cornwall, 210; Wexham, 210; Worcester Hop Market, 478  
 Hot-water Heating, Dangers of, 375  
 House: a, near Leamington, 521  
 'Cliff Towers', Salcombe, 230, 343; Fleet, 385; Goring-on-Thames, 80; Harpenden, 240; H. J. Worrie, 471; Hindhead, near Haslemere, 240; London, 280, 290, 266, 1604; Milford, 191; Moreton-in-Marsh, 606; Northanger, near Godalming, 343; Oak, West Bromwich, 56, 150; Pangbourne, 484; Sutton, 249; the White, Oxford, 80; Wokingham, 102  
 House: Design for a Country, 192; Hertford, Manchester-square, 146; Notable, Fleet-street, 4, 600; Old, Burned in Paris, 246; Old, Western Livandis, Strilind, 205; Sir Isaac Newton's, St. Martin's-street, London, 359; Town, Facade of a, 231 of Ancient, 32; Great Portland-street, 31; Hampstead, 184; Mount Pleasant, Clerkenwell, 525; Old, in Gray's Inn, 525  
 Houses: Town and Country, Electricity in, 127  
 Housing of Working Classes, 50  
 Hughes, J., on Ancient Mortar, 453  
 Hurricane Canons, Buildings in, 453  
 Hygiene, Dictionary of, 435  
 IMPROVEMENT, Parliament-street, and the London County Council, 503  
 Improvements, London, 483, 603  
 Incandescent Gas Lighting, 576  
 India, Anglo-Architecture, 358, 378  
 Industry, Problems of Modern, 93  
 Innerpeffery, the Drummond Chapel, 185  
 Inscriptions and Insignia, Architectural, 285  
 Institute, City and Guilds, 452  
 Institute of Architects: Dinner at Birmingham, 547; Institute of Charges, the, 3  
 Institute, Technical (See Technical)  
 Italian Art, Renaissance in, 213  
 Iveagh, Lord, Gift to Dublin, 599  
 KEATS, Memorial to, Shanklin, 312  
 Kew Bridge, New, 358  
 Kew Observatory, 312  
 Kew, Municipal Theatre at, 228  
 King Rent's Honeymoon Cabinet, 456  
 King's College, Conversation at, 31  
 LABOUR Association, the Free, 52  
 Lake, an Underground, 500  
 Lancashire: the Huddersfield, 304  
 Lamp Standards, Waterloo Bridge, 50  
 Lanercost Priory, 292  
 Langdon, W. E., on Railway Passenger Compaction, 292  
 Lea, Underground Water of the, 245  
 Lectures, the Architectural Association, 167  
 Leicester Abbey, No. 47, 168  
 Lewis, Professor Haver, 547  
 Liability of Public Bodies, 167  
 Library, London, St. James's-square, 227  
 Light Railways, 525, 529  
 Lighting: Electric, in London, 52, 75; Incandescent Gas, 576  
 Lime, Fire Hydrated, in Portland Cement Mortar, 527  
 Lincoln Cathedral, 272  
 Lincoln's Inn-fields: Church of St. Anselm and Cecilia, 357; Public Gardens, 483  
 Lincolnshire Bell-towers, Capitals in, 117  
 Lithography, Exhibition of, 246, 478  
 Local Government, 525, 529  
 Local Government Board Reports, 75, 95, 122, 142, 226, 245, 315, 377  
 Lodge, Prof., on Space Telegraphy, 580  
 London Building Act and Party Walls, 477  
 London County Council (See 'County Council')  
 London: Electric Lighting in, 75; Fires, Attendance at, 4; Improvements, Session 1898-99, 623; Library, the St. James's-square, 227; Newcourt's Survey of, 52; New Streets in, 3; Riverside Churches, 126; Street Electric Lighting, 527; Street Architecture, 100, 208, 265, 285; Water Supply, 299  
 London's Underground Water, Replenish itself, 245  
 Louthbury, Widenings of, 548  
 Low Temperature Research, 75  
 MACLACHLAN, A., on How to become a Successful Contractor, 165  
 McLean's Gallery, Messrs., Pictures at, 404  
 Magazines and Reviews (See 'Books')  
 Magnetic Action of, 245  
 Maidstone, Typhoid Fever at, 226  
 Mairie, Vincennes, Decoration of, 4, 501  
 Malmesbury Abbey, 272  
 Manchester: Arts and Crafts Exhibition, 404; Electric Wiring Rules, 312  
 Manchester to Marylebone, 423  
 Manchester-square Wallace Gallery, 146  
 Mansion House, French English Artists at the, 98  
 Mantel, 121  
 Marble, 33  
 Marble, Moulded, 247  
 Martin v. the London County Council, 167  
 Material: Fire-resisting, Tests of, 312  
 Materials, &c., Inspection of, 453  
 Mausoleum, a, 104  
 Medieval Architecture, M. Corroyer, on, 399  
 Medical Officers of Health, 147, 453  
 Milan Cemetery, Monuments in, 606  
 Milton, and St. Giles, Cripplegate, 227  
 Minister of Education, the, 121  
 Model of Church of Sacre Cour, Paris, 332  
 Mogul Architecture of Fathpur Sikri, 221  
 Monuments: Proposed, to Balzac, 56; the Clairmont, Paris, 284; to M. Alphonse, 75; Monuments: in Milan Cemetery, 606; Preservation of, 121  
 Moorfields, St. Mary's Church, 244  
 Morning Star, Criticisms by the, 94  
 Morocco, 272  
 Mortar: the, late, on Art, 127  
 Mortar: Chemical Examination of, 244; Composition of Ancient, 453; Portland Cement, Fire Hydrated Lime in, 577  
 Mosaic Decoration, Greek Church, Hayswater, 524  
 Municipal Buildings: Godalming, 379, 433, 483; Proposed, Reigate, 168  
 Municipal: Officers and Companies, 547; Telephone, 321; Theatre, Kew, 228  
 Municipal and Sanitary Engineers' Handbook, 128  
 Mural Decoration, Design for, 606  
 Museum: a, Carnavalet, Paris, 41; Natural History, Paris, 290  
 Mysterium, the Craze of, 581  
 NAMES of Scotch Architects, 205  
 Nangle, J., on Sydney Bridge, Stones, 600  
 Natural History Museum, Paris, 270  
 Nemst Electric Candle, the, 282  
 Newark Bridge, Luttery, 474  
 Newcastle-on-Tyne: Architecture, 303, 316  
 Newcourt's Survey of London, 52  
 New English Art Club, 454  
 New Gallery Exhibition, 32  
 Newgate Prison and the Central Criminal Court, 94  
 New York: Fire in, 521; Sculpture Exhibition in, 52  
 Newton's, Sir Isaac, House in London, 359  
 Normandy, Sketches in, 211  
 Nottingham Institute, Clerkenwell, 548  
 Northern Art Guild, Manchester, 436  
 Norwich Cathedral, 58  
 OBLITERATION of the Architect, 265  
 Observatory, New, 422  
 Obstructions by Public Works, 167  
 Office Front, Great George-street, 285  
 Office, Government, the New, 50, 94  
 Old Age Pensions, 122  
 Omdurman in Painting, 578  
 Open Spaces, Petheram Commission, 599  
 Oran Case, Westminster Abbey, 453  
 Oxyrhynchus Papyrus, 273



Town Hall: Colchester, 264, 284; Godal-  
ming, 379, 433, 483; Hamburg, 249;  
Hitchin, 61; Singapore, 427  
Towns, Provincial, Architecture of: Bel-  
grade, 220; Calcutta, 220; Glasgow,  
201; Glasgow, 153, 183; Newcastle-on-  
Tyne, 394, 405  
Traction, Electric (*see* 'Electric')  
Trades Union Congress, 224, 225  
Turners' Company Exhibition, 379  
Typhoid Fever at Maidstone, 226

UNDERGROUND Lamps, Reigate, 505  
Underground: Railways, Electricity on, 505  
57, 477; Water, London, Replenishment  
of, 204; Water of the Lea, 245  
University Coll. Egyptian Antiquities, 50  
University, Proposed, California, 358, 356

VANDALISM at Mont St. Michel, 27  
Varnishes Used in Building Structures, 380  
Vauxhall Bridge, 226  
Village of, 535; the Sinking  
of, 576; 'the Stones of', 582  
Vincennes Decoration of Marie, 4, 501  
Vinegar-yard, Catherine-street, London, 453

WALL Paintings in the Houses of Parlia-  
ment, 30  
Wallace Gallery, Manchester-square, 146  
Walls of Old Paris, 548  
Waltham House, Decoration for Room, 55  
Walthamstow Public Baths, 246  
Water: Famine, Birmingham, 283; Gallery,  
Hertford, 308, 315; London's Under-  
ground, Replenishment of, 204; of the  
Lea, Underground, 245; Scheme, Welsh,  
477; Service, Public, Bury, 95  
Water: Supply: Drought and, 312; Car-  
narvon, 220; Crydon, 232; at the  
Chalk, 545; London, 399; Rural, 331;  
Worcester, 75  
Waterloo: Bridge, Lamp Standards, 50, 337  
Wellingtonburg Accident, the, 226  
Wells Cathedral and See, 474  
Welsh Water Scheme, 477  
Wesley, John, 315; Bishopsage, 312  
West Bromwich, Sanitary State of, 577  
Western Livestands, Stirling, 205  
Westminster: Abbey, Organ, Case, 453;  
Blue Paint, 200; in Building Accident,  
3, 264, 268, 313; Vestry and Workmen's  
Compensation, 122  
Wilton Park, Hounslow, 95  
Willesden: Clock Market, 453; Louthbury, 246  
Winchester, Wolsey Palace, 268  
Windows, Stained, 201, 408, 428, 584  
Wireless Telegraphy, 325, 560, 600  
Wittering, 220  
Wolsey's Lead-pipes, Hampton Court, 176  
Wolverhampton Workhouse, 400  
Wolsey Palace, Winchester, 268  
Wood: Casing, 220; Carving, Engraving,  
Revived, 341; Seasoning by Electricity,  
500  
Woodham w. the London County Council, 3  
Woodstock: Clock Market, 453  
Workmen: Water Supply, 75  
Workhouse Competition: Highwold, 423;  
Wolverhampton, 400  
Workmen's Compensation Workshops for, 312  
Workmen's Compensation, 49; 74; 222, 127,  
312, 477, 500  
Workmen's Dwellings and the L.C.C., 500  
Workmen's Dwellings, 74; 547  
Workshops for Injured Workmen, 312

Blair, M., on Scottish church planning, 341  
 Bill, 50; on: architecture and the fine  
 arts, 58; arts and crafts, 61; bay win-  
 dows, 50; district & vestry surveys, 50  
 Bolton Master Builders' Association, 10  
 Bolton, F., on documentary and archi-  
 tectural evidence, 473, 480  
 Borwick and Levens halls, 96  
 Bowman, J., on foundations, 597  
 Bradford Building Trades Exchange, 128  
 Bradford Building Employers' Liability Asso-  
 ciation, 256  
 Bridges, Ac., effect of subsidence on, 530  
 rigidity, view of engineers to, 55  
 British Clerks' Benevolent Association, 591;  
 Master Builders' Association, 109  
 Britain, the ancient university of, 557  
 British Archaeological Association, 97, 430,  
 457, 557  
 British Association, the, at Bristol, 257  
 Brodie, C. H., on: architecture and the  
 fine arts, 581; excavations at Thebes,  
 10  
 fireproof buildings in the United  
 States, 127  
 Brook Hospital and the Asylums Board,  
 306, 456, 535  
 Brown, W., on art metal work, 463  
 Brown, W. Haig, on the Charterhouse, 384  
 Bruce, W., on housing working classes, 56  
 Builders' Accident Insurance, Limited, 207  
 Builders' Benevolent Association, 10, 456  
 Builders' Clerks' Benevolent Institution,  
 15, 606  
 Building Act, the, 1884, applications under  
 17, 38, 78, 128, 134, 345, 365, 397, 411  
 456, 457, 562







## REPORTS, &amp;c. (continued):—

- dwellings, 56, 530, 583; office accommodation, 101; open spaces, small, and churchyards, 431; painting works, Clapham Common, 48; parks, works in the, 361; Parliament-street widening, 562; paving of streets, and places of worship, 56; powers, transfer of, 317; revenue, new sources of, 7; Rotherhithe Tunnel, 78, 101; sanitary matters, Plumstead, 410; sanitary state of St. Pancras, 410; Science and Art, instruction, 559, 583; sewers, discharges in, 507, 585; Slade rivers, Plumstead Common, 431; slaughter houses, 341; sludge-settling channels, Barking, 361; smoke nuisance, 341, 485, 507; steam organs, 88, 77; Strand improvement (see 'Holborn to the Strand'); street improvements, 37, 101, 360, 383, 411, 485, 562; street noises, new by-laws as to, 77; supervision of buildings, 341; telephones, 341; tenders not received, 317; theatre, Cambridge Circus, 562; theatre, Fulham, 584; theatre, Rotherhithe, 102; theatre site, Tower Bridge southern approach, 36; tramway chief officer, 506, 562; tramway traction, electrical, 361; tramways, 101, 341, 382, 507; Vauxhall Bridge, 101; ventilating columns, 'ornamental,' 583; wages, list of, 405; water examination, 361; water supply, 318, 320, 410, 562; Waterloo Bridge, 101; widening Upper Thames-street, 485; Works Department, 7, 77, 102, 431, 595, 562; Yorkshire, Messrs. and the Council, 109.
- London County Council and the Factory and Workshop Act, 1897, 568**
- London School Board and wages and contracts, 469, 595**
- London and Middlesex Archaeological Society, 384**
- Longstaff, Dr., on historic remains, 77
- Lorimer, R. S., on Scotch gardens, 535
- Low, Mr., on Ventilation, 383
- Lowcock, S., on combined drainage, 355
- Lowry, W., on federation in the building trade, 110
- Ludlow, visit of archaeologists to, 172
- McElligott, Dr., on exhausting steam from washhouses, 191
- McGibbon, A., on tradition and material in architecture, 454
- Mackenzie, Balie, on: cable traction, 361; refuse destructors, 36
- McMahon, Mr., on the training of sanitary officers, 191
- Macmorran, A., on liabilities as to drainage of buildings, 433
- Magenn, E., on hidden dangers in sites, 100
- Magnetic space telegraphy, 580
- Malton, C. E., on church restoration, 359
- Manchester: Arts and Crafts Exhibition, 209; Free Labour Congress, 256, 351; tenement buildings, 291; Tivoli Theatre, 111
- Mansergh, J., on Birmingham water scheme, 316
- Master Builders' Association:** Barry, 65, 610; Birmingham, 497; Bolton, 610; Bristol, 109; Cardiff, 591; Edinburgh and Leith, 591; Huddersfield, 486; Leeds, 217; Maccambs, 15, 467; Northampton, 370; Plymouth, 371; Preston, 370; Reading, 591; Three Towns, 538
- Master Builders, National Assoc. of, 133**
- Master, tradition and, in architecture, 454**
- Meade, T. de Courcy, on workmen's dwellings, 29
- Metal work, ecclesiastical and domestic art, 462**
- Metropolitan Asylums Board:** advertisements on hoardings, 78; appointments, 78, 126, 533, 586; architect, proposed permanent, 533; bills of quantities, 126; Brook House, 369, 583, 593; contract, a delayed, 533; contracts, new clause in, 430; contractors, a claim by, 585; hospital, an obsolete, 585; offices, new chief, 78; tenders, 533
- Michelangelo, 246, 266
- Michelangelo's architecture, 561
- Michelangelo Priory, Sussex, 272
- Middlemore, J. T., on art, 532
- Millburn, W., on building by-laws, 550
- Millard, W., on church restoration, 359; the President of the A.A., 340
- Monkhouse, E. W., on electric lighting, 579
- Morcambe Master Builders, 15, 467
- Morris, J. A., on art work, 592
- Morton, G. H., on the decorator's position, 56
- Motor vehicles, 294**
- Mountford, E. W., on technical institutes, 582
- Municipal buildings, Cork, 152**
- Municipal Officers' Assoc., Croydon, 369**
- Municipal and County Engineers' Association:** Bilston meeting, 269; Birmingham meeting, 201; Cork meeting, 152; Edinburgh meeting, 34, 56, 124; examinations, 124
- National Assoc. of Master Builders, 133**
- National Trust for Places of Historic Interest, &c., 76**
- Newberry, J. E., on excavations at Thebes, 405, 410
- Newcastle Building Trades' Exchange, 199**
- Nichols, H. B., on sewage disposal and tidal estuaries, 315
- Nicholson, G. M., on arts and crafts, 451
- Northampton Master Builders' dinner, 370
- Northern Counties Federation of Building Trade Employers, 110, 416**
- Nursery, P. F., on rhea fibre, 427
- Oriel and bay windows, 502
- Overcrowding, 295
- Parker, Mr., on refuse destructors, 36
- Parry, W. Kaye, on: septic tank system, 191; sewage purification, 205
- Parry-wall disputes, 351, 370, 468
- Paton, Mr., on: cable traction, 361; refuse of working classes, 56; refuse destructors, 36
- Patrick, G., on Church of St. Pega, 100
- Patt, Balfour, on archaeology, 407
- Payne, Alex., on: bay win 7, 506; District Surveyors, 507; excavations at Thebes, 410
- Pentland, H., on 'the new architect,' 401
- Peterborough, British Archaeological Association, 28, 97
- Peterborough Gentlemen's Society, 98
- Pickering, Mr., on: biological treatment of sewage, 57; by-laws relating to new street sewers, 301; sewer ventilation, 379
- Pite, Beresford, on: electric lighting, 579; Michelangelo's architecture, 561; the Architectural Association, 339
- Planning: house, in Scotland, 487; Scottish Church, 341
- Platt, Mr., on sewer ventilation, 37
- Plumbers' congress, Glasgow, 193; registration, 276, 491
- Plymouth: builders and the Dorset County Council, 111; Corporation and advertisement, 401; Corporation and advertisement, 401; Corporation and advertisement, 401
- Porter, Dr. C., on water for flushing, 315
- Power, electrical: practical applications of, 579; transmission of, 500
- Pratt, H. W., on the Archl. Assoc., 334
- Prece, W. H., address to engineers, 399, 411
- Prendergast, Col., on: architecture, 446; arts and crafts, 460
- Presidential Addresses:** Architectural Association, 333; Architectural Association of Ireland, 401; Association of Master House Painters, 361; Association of Municipal and County Engineers, 341; Civil and Mechanical Engineers' Society, 531; Edinburgh Architectural Association, 487; Institution of Civil Engineers, 399, 411; Leeds and Yorkshire Architectural Society, 462; Northern Architectural Association, 480; Royal Architectural Institute, 66; Royal Institute of Architects of Ireland, 585; Royal Institute of British Architects, 424; Royal Institute of Public Health, 189; Sanitary Inspectors' Association, 433; Sanitary Institute Congress, 285, 290, 291, 2041
- Surveyors' Institution, 456; Trades Union Congress, 299**
- Preston Master Builders' Association, 370**
- Priestley, Dr., on combined drainage, 314
- Priory of Inchmahome, 7
- Prynn, G. F., on: architecture and design, 344; architecture and the fine arts, 550, 581; arts and crafts, 462; bay windows, 505; excavations at Thebes, 409; the Architectural Association, 335, 340
- Public Health Act, 1888, case under the, 159**
- Public Health, Royal Institute of: Dublin Congress, 186, 189, 206, 228**
- Railway, Central London, 385**
- Ram Hall, Warwickshire, 148
- Rathbone, E., on architecture, 487
- Rawsley, Canon, on historic remains, 77
- Read, R. G., on tall buildings in the United States, 597
- Reading Master Builders' Association, 592**
- Refuse destructors, 36, 186
- Regina v. Pawley, 16
- Registration of Plumbers, 276, 491
- Reinach, M., on the Venus of Milo, 34
- Renaissance in France, architecture of the, 482, 533, 603**
- Restoration, church, 359**
- Rhea fibre for textile purposes, 427
- Rhind lectures in archaeology, 467
- Ricardo, Halsey, on arts and crafts, 461
- Rich, F. W., address by, to architects, 480
- Roads: main, Ireland, 152; extraordinary traffic over, 111; tarred macadam, 35, 124
- Robson, O. C., address to Municipal Engineers, 341; on the biological treatment of sewage, 57; on Municipal Engineers, 153; on sewer ventilation, 37
- Robson, P. A., on the architect's library, 485
- Rochester, Archl. Association, visit to, 287
- Roman antiquities in S. Germany, 55
- Ross, T., on house planning, Scotland, 487
- Rotary converters, 423
- Rottmann, A., on decorative design and colour, 503
- Royal Archaeological Institute, 55, 96, 429, 557**
- Rural districts, sanitary defects in, 316
- Salford Hall, Warwick, 170
- Sanitary Inspectors' Association, 157, 191, 294, 361, 433, 584**
- Sanitary inspectors, functions of, 370**
- Sanitary Institute: Congress, Birmingham, 15, 109, 285, 289, 313, 601; examinations, 65, 148, 357, 601**
- Sanitary officers, training of, 191**
- Sanitation, modern, 285**
- Satchell, H. A., on bay windows, 505
- Scarborough, building dispute at, 111
- School Board, London, and wages and contracts, 457, 591
- School of Design, the Archl. Assoc., 344
- School of Engineering, Crystal Palace, 457, 591
- Scotch ecclesiastical monuments, 492
- Scotch gardens, 532
- Scotland, house planning in, 487
- Scottish: Building Trades Federation, 416; church planning, 341; Plumbers' Congress, Glasgow, 193; Society of Art Workers, 591
- Seaford, action by building owner at, 468
- Seidler, C., on Crosiers, 557
- Septic tank system, 191
- Seth-Smith, W. H., on the Architectural Association, 334, 340
- Sewage: bacterial treatment of, 531; biological treatment of, 56; disposal, and tidal estuaries, 315; disposal in tropical climates, 190; purification, progress, 206**
- Sewerage, septic tank and, 191**
- Sewer ventilation, 36, 594**
- Sever, on, and sludge-settling, 361
- Sienna and Baldassare Peruzzi, 584
- Signs, illuminated public house, 493
- Sites: hidden dangers in, 190; subsoil in relation to, 489
- Slater, J., on: electric lighting, 579; the late Professor Hayter Lewis, 578
- Smells, propagation of, 252
- Smith, G. H., on sanitary defects in rural districts, 316
- Smith, Percival Gordon, on: building by-laws, 550; fireproof construction in the United States, 527
- Smith, Professor Roger, on architecture, 427
- Smith, Savile, on: biological treatment of sewage, 57; sewer ventilation, 37
- Smith, Sir J., on Birmingham architecture, 527
- Society of Arts, 440, 454, 491, 500, 513, 567**
- Society of Engineers, 55, 319, 341, 385, 427, 527**
- Solomon, L., on a United States specification, 527, 567
- Soutar, J., on architecture, 402
- Spalding visit of archaeologists to, 98
- Spenn Valley Builders' Association, 440**
- Spiers, R. Phené, on excavations at Thebes, 409, 410; Santa Sophia, Constantinople, 521
- Stamford, visit of archaeologists to, 98
- Statham, H. H., on: bay windows, 505; documentary and architectural evidence, 460; the Architectural Association, 339
- Steam, exhausting, from washhouses, 191
- Stewart, A., on sewer ventilation, 36
- Stokes, Leonard, on bay windows, 505
- Stone, Sir B., on architecture, 532
- Strand improvement scheme, 37, 43
- Strange, C. H., on architectural tendencies, 430
- Streams and rivers, pollution of, 601
- Street: making, hygienic aspects of, 190; what is a new? 447
- Streets: London's congested, 464; new, and buildings, by-laws as to, 391
- Structures, temporary, and the L.C.C., 447
- Sturgis, R. C., on church architecture, 250
- Subsidence, effect of on bridges, &c., 539
- Subsoil in relation to sites, 489
- Surrey Archaeological Society, 79, 149, 591**
- Surveyors' Institution: London Building Act and official supervision of buildings, 457; President's address, 456**
- 'Swakeleys,' near Uxbridge, 76
- Symonds, W., on building matters, 434
- Tait, C. J., on Michelangelo, 246, 266
- Tarred macadam roads, 35, 124
- Technical: education, 603; Institutes, 582
- Telegraph poles, oscillation of, and damage to buildings, 539
- Telegraphy, magnetic space, 580
- Thebes, excavations at, 405
- Thompson, S., on rotary converters, 423
- Thomson, G., on drain testing, 538
- Thudicum, C., on sewage, 531
- Townley, J., on building matters, 440
- Tracion, cable, 36
- Trades training school, Carpenters' Co., 603
- Trades Union Congress, 288
- Tradition, architectural, 287
- Tradition and material in architecture, 454
- Training of sanitary officers, 191
- Tramways, British cable, 584
- Tramways, electric, 152 (see also 'London County Council')
- Venus of Milo, 34
- Cases, 412, 434, 563
- Tropical climates, sewage disposal in, 190
- Trust, National, for places of historic interest, &c., 76
- Tudor-street ancient light case, 16
- Tunnels and buildings, ventilation of, 557
- United States, fireproof construction in, 526**
- University, the ancient, of Britain, 557
- Unwin, Prof. W. C., on fireproof construction in the United States, 527
- Venice, 522
- Ventilation, 383
- Ventilation, sewer, 36, 294
- Ventilation of tunnels and buildings, 557
- Venus of Milo, 34
- Vibration, injury to a building through, 256
- Vigers, R., address to surveyors, 456
- Visit: Institution of Junior Engineers: Lombard-street station, City and South London Railway, 457
- Visits: Architectural Association, Arno's Grove, 193; Hever Castle, 12; Rochester, 287; Swakeleys, near Uxbridge, 76 (see also 'Leamington')
- Visits: Society of Engineers: Brighton, 55; Central London Railway, 341, 385
- Wages, dispute as to, 493**
- Wages and contracts, London Board School and, 467, 591**
- Walker, J. D., on building trades' exchanges, 109
- Warwick, Architectural Assoc. visit to, 148
- Washhouses, exhausting steam from, 191
- Water for domestic flushing purposes, 315
- Water scheme, Birmingham, 316
- Waterhouse, Paul, on oriel and bay windows, 501, 505
- Waterworks, Cork, 152
- Watson, F. L., on refuse destructors, 186
- Watson, J., on domestic architecture, 561
- Watton Abbey, Yorkshire, 248
- Waverley Abbey, Surrey, 149
- Weaver, W., on the London Building Act, &c., 559
- Webb, Aston, on planning, 344
- Welsh marches, 487
- West of England Bldg. Trade Employers, 434
- West, W. W., on sanitary matters, 294
- Westminster Bldg. disaster, 16, 44, 370, 507
- Westminster, Duke of, on historic remains, 77
- Whall, Christopher, on arts and crafts, 461
- Whalley, archaeologists visit to, 124
- White, A., on house painters, 363
- White, C. W., dinner to, 531
- White, W. on documentary and architectural evidence, 480
- Whitchapel building dispute, 371
- Whitley, H. M., on Michelangelo Priory, 272
- Wike, Mr., on: biological treatment of sewage, 57; housing of working classes, 56; refuse destructors, 36; roads, 35
- Williams, E., on the Parliament House, 551
- Wilson, C. L., on a Black country town, 269
- Wilson, H., on arts and crafts, 458, 462
- Windows, oriel and bay, 501
- Witness, expert, and his fees, 416
- Wood, Alex., on excavations at Thebes, 410
- Woodson, A., on a tour in Berkshire, 429
- Woodman, Dr., on septic tank system, 191
- Woodward, W., on district surveyors, 561
- Wool Church, Dorset, 487
- Working classes, housing of the, 66
- Workmen's compensation and Employers' Liability, 197, 324, 352, 363, 369, 370, 416, 468, 513, 514, 540, 565, 592
- Wrought ironwork, 350
- Yorkshire Federation of Bldg. Trades, 323**
- Young, J., on refuse destructors, 36

## CORRESPONDENCE.

## Subjects of Letters.

- Advertising, Society for Checking Abuses of Public, 300
- Anachronism, a sanitary, 213, 274
- Appointment of architect, Salford workhouse, 154, 194, 334
- Architect, obliterating the, 295
- Architect, recognition of the, 405
- Architect, warrants, 347
- Architect's use of books, the, 563
- Ardrrossan Fever Hospital competition, 533

## Subjects of Letters (continued):—

- Books, the architect's use of, 563
- Brussels International Congress of Architects, 607
- By-laws, model, and local requirements, 436
- Canterbury, St. Martin's, 174
- Charges, the Institute case of, 12
- Church, Blackrock, Dublin, 487
- Churches, two-spired, 60
- Clerks of works and their salaries, 587

## Subjects of Letters (continued):—

- Colston's Hall, Bristol, 607
- Competition: Ardrrossan Fever Hospital, 533; Town Hall, Bristol, 609; Godalming Cemetery chapel, 213; Reigate municipal buildings, 174, 213
- Congress of Architects, Brussels International, 607
- Contract, fittings not in accordance with, 320

## Subjects of Letters (continued):—

- Decoration of St. Paul's, 587, 607
- Drain-pipes, iron v. stoneware, 102
- 'Drew Thomas, architect,' 234
- Durham Gallies, the, 509
- Fire-bricks, 366
- Fittings not in accordance with contract, 320
- Galilee, the Durham, 509
- Geological Museum, the, 1



CORRESPONDENCE—*Subjects of Letters (continued):—*

Godalming Town Hall competition, 413  
435, 483  
Horsham cemetery chapel competition, 213  
Hospital competition, Ardrossan Fever, 533  
Hydraulic ram problem, 154  
Institute scale of charges, the, 12  
Iron v. stoneware drain-pipes, 102  
James II.'s statue, Whitehall, 234  
'Later Renaissance architecture in England,  
Lectures, architectural, University Coll., 295  
Libraries of the Middle Ages, 39  
Mausoleum, an old London, 194, 320  
Model by-laws and local requirements, 4  
Model of Stonehenge, a, 366  
Municipal buildings, Reigate, 174, 213  
Newark Priory, 273, 295  
Newcastle architecture, 366  
Pipes, stoneware drain v. iron, 102  
Ram, hydraulic, 154  
Recognition of the architect, 465  
Reigate municipal buildings, 174, 213  
'Renaissance architecture, later, in Eng-  
land, 82  
Royal Commission on Sewage, 366

*Subjects of Letters (continued):—*

St. Martin's, Canterbury, 174  
St. Paul's, decoration of, 493, 607  
St. Saviour's Southwark, 295  
Salaries, clerks of works and their, 587  
Salford Workhouse, appointment of archi-  
tect, 154, 204, 234  
Sanitary anachronism, a, 213, 274  
Scarcity of water, 370, 347, 366  
Scene, what is the, 158  
Sewage treatment, Royal Commission on, 366  
Sewers, ventilation of, 533  
Sketching buildings, difficulties in, 412  
Smoke nuisance, the, 509, 533  
Society for Checking Abuses of Public  
Advertising, 320  
Staining Riga or Austrian wainscot, 194  
Statue, James II.'s, Whitehall, 234  
Stonehenge, a model of, 366  
Stoneware v. iron drain-pipes, 102  
Tank, water, 12  
Tinted chimney, 39  
Tudor-street ancient light case, 39, 59  
Two-spired churches, 60  
University College architectural lectures, 295  
Ventilation of sewers, 533  
Wainscot, Riga or Austrian, staining, 194  
Warning to architects, 347  
Water, scarcity of, 370, 347, 366  
Water tank, 12  
Whitehall, James II.'s statue, 234

## Writers of Letters.

Batsford, B. T., 'Later Renaissance archi-  
tecture in England,' 34  
Black, A., the Geological Museum, 12  
Blissill, Thos., Tintern Abbey, 59  
Broadbent, J. B., appointment of architect,  
Stard, 234  
Constantine, J., ventilation of sewers, 533  
Dickinson, H. W., an old London mauso-  
leum, 194  
Downing, A., fire-bricks, 366  
Drew, T., 'Thomas Drew, architect,' 334  
Eden, F. C., decoration of St. Paul's, 607  
Evans, R., Society for Checking Abuses of  
Public Advertising, 320  
Fitzgerald, Percy, What is the scene? 128  
Fletcher, Banister, Tudor-street ancient  
light case, 39  
Forsyth, W. A., decoration, St. Paul's, 607  
Glennie, F. Forbes, Newark Priory, 295  
Irvine, J. T., St. Martin's, Canterbury, 174  
Lanchester, Stewart, & Richards,  
Godalming Town Hall competition, 413  
London Warning and Ventilating Co., the  
smoke nuisance, 509  
Mitchell, E., a sanitary anachronism, 274  
Murray, Forrestor, St. Andrew's, Black-  
rock, Dublin, 467

*Writers of Letters (continued):—*

Nash, W. Hilton, Newark Priory, 273  
Nicholson, G. M., the scarcity of water,  
340, 366  
Pite, Beresford, Tudor-street ancient light  
case, 39  
Reavell, G., model by-laws and local  
requirements, 436  
Robson, P. A., the architect's use of books,  
61  
Russell, C. I., model of Stonehenge, 366  
Sim, E. H., warning to architects, 347  
Smith, H., Colston's Hall competition, 607  
Smith, J., Roger, architectural lectures,  
New Leeds, 155  
Stanger, G. H., Reigate Municipal Build-  
ings competition, 175, 213  
Thompson, W., St. Saviour's, Southwark,  
295  
Tormann, F., Newcastle architecture, 366  
Troup, F. W., libraries of Middle Ages, 39  
Vernon, G., iron v. stoneware drain-pipes,  
102  
Wheeler, F., Horsham cemetery chapel  
competition, 213  
White, W., the Durham Galilee, 509  
Wight, N., a sanitary anachronism, 213  
Worthington, T. & P. S., appointment of  
architect, Salford workhouse, 154

## GENERAL.

## Abattoir, Brighton, 590

Aberdeen: Corporation tramways, 324;  
granite exports to America, 234; granite  
trade, 531; St. Mary's Cathedral, 287, 321;  
School Board and contractors, 64  
Accident at Kennington Theatre, 391  
Almshouses, West Hartlepool, 238  
Altar: Kilnaleck, 42; Lusk, Dublin, 178  
Altar rails, Cathedral, Catherlogh, 60  
America, Aberdeen granite exports to, 324  
American competition, Glasgow, 133, 197,  
323, 441  
Antitoxine, 276  
Antiquarian discovery, Wislaw, 177  
Appointment, 15, 42, 56, 84, 107, 149, 237,  
255, 404, 410, 512, 513, 586  
Arbitration case, 169  
Arcade, Birmingham, 368, 389  
Archaeological discovery, Clyde, 216  
Archaeological remains, Birmingham, 64  
Archbishop's house, Westminster, 217  
Architectural appointment, Salford, 107  
Art Gallery, Whitechapel, 536  
Arts and Crafts, Central School of, 15, 276  
Asylums: Bangour, 153; Canterbury, 106  
Chadwell Heath, 131; Down, 127; Inver-  
ness, 215; Lancaster, 322; Middles-  
brough, 42; Upton, 430, 421  
Australian Mining Museum, 369  
Australian patents, 256

## Back-to-back houses, Leeds, 567

Bakery, co-operative, Bedlington, 587  
Bank: Bishop Auckland, 14; Edinburgh,  
397; Leeds, 490; Lonsdon, 41, 194, 390;  
Morley, 565; Seaham Harbour, 508;  
Shaw, 369  
Barrs: builders and workmen's compen-  
sation, 65; development of, 550  
Bath, discovery at Roman baths, 84  
Baths: Aberdeen, 83, 275; Banbury, 237;  
Burslem, 391; Chester, 389; Dumfries,  
63; Folkestone, 330; Hull, 340; Hunst-  
led, Leeds, 513; Liverpool, 215; Lin-  
coln, 176; Morley, 14; Stratford,  
14; Tunbridge Wells, 288  
Battersea Polytechnic, 276  
Belfast City Hall, 390  
Bells, Heathfield, 609  
'Besto' glass for skylights, &c., 256  
Bidston Court, Cheshire, 133  
Birkbeck Building Society, 64  
Birmingham, Colmore estate, 389  
Blind Institution, Plymouth, 254  
Board Schools, London, 492  
Boiler incrustation, 256  
Botanic Society, Royal, 133  
Bradfield College, 401  
Brick: carrier, a, 592; lining for swimming  
baths, 107, 217; trade, Peterborough, 415  
Bridge: Bonhill, Dumbarton, 64; Clyde,  
466; Fyvie, 337; Gilliland, 276; Kew,  
415, 460, 467, 491; Leicester, 415; Lin-  
coln, 275; London, 350, 513; Mil-  
brook, 330; Quebec, 298; Sheffield, 41,  
566; Southwold, 40; Tyne, 77; Wear, 337  
Brooks' Club-house, London, 133  
Builders' Accident Insurance, Limited, 84  
Building estate, Bewell, 14  
Building in: Aberdeen, 349, 360, 536, 608;  
Blackpool, 600; Burton-on-Trent, 390;  
Dewsbury, 233; Hampstead, 195; Leeds,  
439; London, 438; Ravenstonedale, 177;  
Staffordshire, 237, 276, 513; Sunderland,  
609; West Ham, 438  
Building regulations, 142, 200, 371  
Building trade, briskness in, the, 392  
Building Trades Exhibition, 339  
Building and allied trades, 468

Café, Botanic Gardens, Regent's Park, 188  
Canal, ship, Great Lakes to Hudson, 262  
Canon-row, Westminster, 512  
Capital and Labour, 275, 256, 276,  
592; Auckland, 15; Barry, 277, 370, 392;  
468; Berwick, 15; Birmingham, 607;  
Bishop Auckland, 111; Bolton, 158, 178,  
441; Bristol, 43, 65, 85, 110, 158, 178, 197,  
213; Durham, 197; Glasgow, 65;  
Greenock, 43; Hereford, 467; Lanca-  
shire, 43; Lancashire and Cheshire, 85;  
Lancaster, 278; Leeds, 441; Leicester,  
351; Liverpool, 43; London, 351; Man-  
chester, 370; Marazion, 167; Middles-  
brough, 43; Newport, 43; Nottingham,  
16, 43; Paisley, 65; Peterhead, 416;  
Shrewsbury, 277; Sunderland, 43, 110,  
492, 567; Swansea, 15, 43, 65, 284, 466,  
492; Tiverton, 65; Warrington, 15  
Cardiff building by laws, 84  
Carrier, a brick, 392  
Carr's patent tile box, 15  
Cathedral, St. Colman's, Queenstown, 212  
Chair, safety window-cleaning, 133  
Chamber of Commerce, Dundee, 369  
Chapel: City of London Asylum, Stone,  
3; Mill Hill school, 40  
Chemide improvements, London, 109  
Chubb & Sons' manufacturing works, 368  
Church Building News: Anglican, Catho-  
lic, Dissenting, &c.—Abercromby, 275;  
Aberdeen, 155, 287, 370, 467, 477, 487,  
535; Accrington, 13; Acton, 214; Agha-  
dowry, 176; Antford, 414; Appleford,  
525; Aston, Birmingham, 555; Auster-  
less, Aberdeen, 129; Auldearn, 195; Ayr,  
155; Ballymacnab, 40; Ballynaghy,  
367; Barged, 367; Barrister,  
Belfast, 367; Barton, 401; Bar-  
wick, 367, 536, 585, 589; Bellahouston,  
275; Benwell, 296; Berhill, 195, 388;  
Birkdale, Southport, 155; Birkenhead,  
207; Birmingham, 63; Blackburn, 416;  
Blackrock, Dublin, 438; Blaydon, 589;  
Blowick, 63; Bolsover, 397; Boston,  
580; Bray, 82; Bretherton, 341; Bristol,  
414; Brinkham, 365; Bromley, 377;  
Bryanston, 155; Bulmer, 499; Dun-  
gall, 414; Burley, Leeds, 515; Burstock,  
321; Caincross, 389; Calow, 13;  
Cardiff, 12, 63, 490, 515; Carmel, 158;  
Carnock, 39; Carrington, 63; Castleton,  
63; Chesterfield, 433; Chiddington, 589;  
Church Gresley, 299; Clonon-on-Sey,  
511; Cleethorpes, 235; Clonakenny, 84;  
Cogan, 348; Colinton, Edinburgh, 465;  
Croydon, 134, 155; Compton, 13; Cork,  
190; Coupar Angus, 195; Cowes, 176;  
Cropton, 480; Crosby, 275; Darlington,  
43; Deanhaugh, 565; Denaby Main,  
215; Derby, 130, 190; Devonport, 129,  
438; Donaghmoyne, 215; Dublin, 128,  
438; Dundee, 82, 176, 367, 489; Durham,  
390; Eccles, 241; Edgworth, Birming-  
ham, 321; Edinburgh, 65, 269, 359;  
Elmswell, 535; Embay, 176; Falkirk,  
255, 535; Felixstowe, 501; Fillogley,  
215; Finglas, Dublin, 195; Fochabers,  
41; Ford, 389; Forder, Saltash, 284;  
Fortrose, 490; Frankford, Tullamore,  
607; Galeshead, 414; Gaywood, 465;  
Giffnock, 580; Gillingham, 195; Glasgo-  
w, 40, 391, 43, 438, 565; Gortin, 365;  
Great Marlow, 347; Greenock, 130;  
Greystones, 63; Greyfriars, 155; Har-  
wich, 367; Hawarden, 13; Heath-  
field, 609; Herne Bay, 195; Hessele,

255; Hindley Green, 13; Hingham,  
82; Holbrook, Sheffield, 195; Hor-  
field, 107; Horsey, 14, 41; Howth,  
Dublin, 176; Hurford, 389; Ilfrac-  
ombe, 15; Inverfrefry, 382; Inver-  
ness, 565; Ipswich, 32, 46; Irthin-  
gton, 41; Islington, 108; Kensal Rise,  
466; Kerse, Greenacres, 240; Kilma-  
crae, 371; Kirkley, 349; Kirtle, Edin-  
burgh, 155; Kirtton, 107; Laurencekirk,  
176; Leamington, 40; Leeds, 41, 82, 176,  
321; Gersgow, 322; Lincoln, 13, 367,  
466; Liverpool, 82; Llantrisant, 155;  
London, 61, 62, 65, 107, 217, 254, 295,  
297, 389, 416, 550, 552, 571; London  
thorpe, 389; Lewes, 107; Lytham,  
414; Macclesfield, 367; Malmesbury  
(Abbey), 68; Manchester, 31, 348;  
Mearnsbrook, Sheffield, 468; Mettingham,  
535; Middlesbrough, 155, 176; Miles  
Platting, 32; Monmual, 63; More-  
cambe, 62; Morley, 82; Morpeth, 275;  
Morven, 608; Muwew, Hull, 82, 424;  
New Alresford, 215; Newbiggin, 388;  
Newcastle, 511; New Houghton,  
40; New Invention, 195; Newland,  
Hull, 323; Newport, 438; North  
Hagbourne, 459; Northampton, 82,  
107; Norwich, 215; Nottingham, 14,  
129; Nuncliff, 367; Oldham, 129,  
438; Omagh, 535; Oswestry, 31;  
Overstrand, Cromer, 176; Padstock, 469;  
Pain, 489; Painsley, 367; Palsall, 193;  
Port Clarence, Durham, 367; Portlough,  
83; Preston, 63; Queensferry, 414;  
Queenstown, 212; Reading, 383; Red-  
cliff, 63; Reiford, 505; Renhill, Bristol,  
129; Rhyllyddes, 275; Rolleston,  
195; Roobrick, 397; Rother, 156;  
Rugby, 235; Runwell, 37; Rushton,  
215, 248; St. Helens, 13; Salisbury  
(Cathedral), 63; Scarborough, 14, 536;  
Scunthorpe, 176; Slawburgh, 399; Shel-  
field, 82, 107, 275, 511, 580; Shirebrook,  
Nottingham, 130; Shotton, 275; Skeg-  
ness, 348; Small Heath, Birmingham,  
367; South Langside, Glasgow, 341;  
South Shields, 348; Southend, 13; South-  
ampton, 608; Soverly, 348; Spark-  
brook, 129; Spire, 408; Stainton, 414;  
Stanley, 414; Stannington, 535; Stec-  
ford, 438; Stirling, 510; Stockport,  
155; Stone, 13; Stratford-on-Avon, 82;  
Sunningdale, 565; Swadlow, 134, 590;  
Swansea, 388; Swindon, 297; Tadcaster,  
296; Thornaby, 589; Thorne, 388;  
Thuxton, 13; Topcroft, 414; Trim, 176;  
Trimley St. Martin, 480; Turo (Cath-  
edral), 389; Tunbridge Wells, 63; Twick-  
enham, 63; Wakefield (Cathedral), 465;  
Walsby, 107; Wakefield, 321; West Brom-  
wich, 13; West Hampstead, 401; West Hall,  
pool, 535; West Stanley, 13; Weston-  
super-Mare, 13; Westwood, 555; Whit-  
chapel, 82; Whitworth, 505; Whitworth,  
Wilmsham, 215, 348; Wood Green, 389;  
Worstead, 176; Wrexham, 40, 367; Yar-  
mouth, 206; York, 13  
Church, St. Michael, Bussiahaw, 392  
Church House, Liverpool, 166  
Church Institute, Chesterfield, 433  
Churchward, Hampstead, 427  
Church, Hengler's, Hull, 166  
Clergy and Artists' Association, 124  
Clock: Glasgow Court, 197; Leicester,  
158; Wilshamstead, 599  
Club buildings: Aberdeen, 235; Ardwick,  
345; Birkenhead, 430; Blackpool, 400;  
Bridlington, 322; Brimsbam, 349; Byker,  
Newcastle, 537; Egham, 565; Farsley,

82, 288; Gorton, 107; Greenfield, Leeds,  
414; Hawick, 367; High Wycombe,  
390; Huddersfield, 156; Ipswich, 108;  
Keighley, 465; Laurencekirk, 235;  
Londonderry, 215; Loxborough, 236;  
New Leeds, 155; Northampton, 437;  
Plymouth, 389; Pudsey, 466; Ribbles-  
ton, 340; Southport, 347; South Shields, 14,  
322; Wollington Quay, 349; Woking, 366  
Collapse of a building: Govan, 297; New-  
castle-on-Tyne, 440  
College: Bradford, 41; Derby, 215;  
East London, 298; Dartmouth, 249;  
Leeds, 365; Liverpool, 41; Manchester, 249,  
342; Newport, 215; Scarborough, 158;  
Colleges, labour market in, the, 323  
Competition: Agecroft Cemetery, 561;  
baths, Goole, 456; baths, Leyton,  
456; baths, St. Pancras, 109, 271;  
California University, 341, 358, 386;  
church, Glass Houghton, 483; church,  
Wolverton, 109; Colston's Hall, Bristol, 456,  
584; constabulary offices, Warrington,  
391; exhibition buildings, Glasgow, 249;  
fire-brigade station, Bradford, 387;  
fountains, Manchester parks, 584; Godal-  
ming Municipal Buildings, 388; hall,  
san, 508; hospital, Hart, Carlisle, 77;  
the, Hop Market, Worcester, 483;  
insurance buildings, Aberdeen, 606;  
lunatic asylum, West Bangour, 224; park,  
Widnes, 188; public offices and depot,  
Yardley, 508; rebuilding King-street  
area, Glasgow, 365; Royal Institution,  
Liverpool, 489; school, Bala, 508; school,  
Gloucester, 102, 232; school, Greeland,  
Halifax, 121; school, Wrexham, 508;  
schools (Well's Blue), Somerset, 254;  
Shrewsbury Technical School, 606;  
Tavistock-road, Plymouth, 53, 532; techni-  
cal school, Smethwick, 341; Town Hall,  
Singapore, 271; vagrant wards, Pavsey  
Workhouse, 584; workhouse extension,  
Wolverhampton, 483; workhouse, Wednes-  
field, 366; workhouse, Wolverhampton,  
55, 103  
Conveniences, public: Birmingham, 414, 512;  
Burslem, 389  
Co-operative stores, Consett, 415  
Cottages, Penrith, 216  
County chamber: Bristol, 64; Chester  
County buildings, Northampton, 439  
County Council water scheme, 538  
Cress: Minshull Vernon, 12; Eddington,  
46  
Custom House, Cardiff, 177, 438  
Dinner, trade, 84  
Dairy Institute, Reading, 14  
Deponford Fund House, 63  
Discoveries: archaeological, the Clyde, 216;  
Roman remains, Leicester, 64  
District surveys, duties of, 158  
Docks: Aberdeen, 255; Southampton, 269;  
Dorchester main roads maintenance, 369  
Drainage (see 'Sewage')  
Drugs: 'Edin', London, 296  
Duff's dwellled wood paving, 592  
Dunaid Chamber of Commerce, 389  
Dry Lane Theatre, stage, 566  
Edinburgh: building, fall of a, 178; gas-  
works chimney, 110  
Electric Lighting News: Barnsley, 408;  
Belfast, 397; Brighton, 276; Bury St.



GENERAL (continued):—

**GENERAL (continued):**

- Edmunds, 100; Cheltenham, 440; Crewe, 205; Doubs, 233; Gloucester, 610;
- Hanley, 275; King's Lynn, 265; Leigh, 258; Leith, 217; Leyton, 237; Llandudno, 430; Manchester, 415; Middlesbrough, 31; Newry, 200; Lyme, 298;
- Norwich, 183; Redditch, 221; Rochdale, 564; Salford, 277; Shrewsbury, 384;
- Tunbridge Wells, 390; Yarmouth, 101.

**Engineering trades report, 19**

**Estate, 100**

**Excavations at Clab gully, 23**

**Excavations at Waverley Abbey, 59**

**Exchange, Newcastle Guildhall, 216**

**Exter, monastic buildings of, 402**

**Exhibition: Art, Aberdeen, 324; Buildings, 100; Glasgow, 100; School of Arts and Crafts, London, 15; Lima, 15; Laundry, London, 133; Lithographic, London, 436; Middlesbrough, 196; South African Industrial and Art, 34; Western Art, 100.**

**Exhibition buildings, Glasgow, 57**

**Explosion, Wellington-strand, Strand, 399**

**Factory:** Bristol, 349; 466, 512; Leeds, 350; Wolverhampton, 368  
**Fire:** Broomfield, 533; Newport, 513  
**Fire alarm:** 108, 157  
**Fire at abbeys' premises:** 10, 370, 467  
**Fire at:** Bisham Abbey, Marlow, 298; Norwich, 133, 154; South London, 84  
**Fire:** Brigade, Metropolitan, 385; engines, 385; station, 353; protection of buildings from, 411  
**Fire station:** Carlisle, 450; Dundee, 349; Lewisham, 511; Liverpool, 440  
**"Fitzroy Pictures," the:** 467  
**Flail:** Bloomsbury, 439; Hampstead, 14  
**Flue:** 367; Dover-street, 83; Regent-street, 102  
**Font:** Aberdeen, 256; Cockington, 431; Lambeth, 592; Paignton, 513; South-

port, 84  
**Portals and Colonial News:** Austria, 136  
 Belgium, 136; Brussels, 15; Calcutta, 196, 513  
 Canada, 298, 323, 512; France, 15, 49, 64,  
 84, 100, 127, 157, 177, 196, 216, 236, 266,  
 276, 282, 330, 350, 369, 390, 415, 440, 467,  
 491, 512, 537, 567, 594, 605; Holland, 127  
 157; Johannesburg, 157; Lima, 15, 152  
 New South Wales, 237, 266, 537; Penang, 610;  
 Singapore, 610; South Africa, 34, 39,  
 Sydney, 369; United States, 512; Victoria,  
 298; Wellington, 196; Australia, 197, 298  
**Forest and Wood and Upton Park**  
**Fountain:** Coleford, 467; Exeter, 438;  
 Stoke Bishop, 168, 235  
**Fountains, street, and cattle troughs,** 57  
**Freemasons,** Quatuor Coronati Lodge, 441  
**Furniture reproduction, a piece of,** 65

Gasworks : Nelson, 236 ; Rotherham, 298 ;  
Selby, 248  
Gateway, Abbot Reginald's, Evesham, 235  
Girders, interlocking, 502  
Glasgow : building regulations, 391 ; School  
of Art, 197 ; Technical College, 592 ; water-  
pipe contract, 133, 197, 233, 441  
Glass : 'Besto', for skylights, 256 ; prism,  
new use for, 440  
Golders Hill estate, 467  
Government offices, new, 84  
Granite : lectures on, 582 ; trade, Aberdeen,  
538  
Guildhall : improvements at, the, 125 ;  
School of Music, 62 ; Newcastle-on-Tyne,  
235

Haddon Hall, xi  
Hale, a hamlet, parish, public, town,  
village, &c., Anfield, 30; Belfast, 255;  
30; Bournewood, 414; Bourn-on-Town,  
254, 586; Carrickfergus, 63  
Cemeter., 707; Clogher, 192, 322;  
Comber, 415; Donaghadee, 107;  
349; Dublin, 51; Durham, 30; Edzell,  
313; Exeter, 349; Fazeley, 566; Gateshead,  
30; Halkyn, 197; Harley Winter-  
Leys, 30; Llanfair, 197; Lomney, 406;  
Lumphannan, Aberdeen, 256; Manchester,  
322; Neilston, 30; Norwich, 566;  
Onchan, 51; Ordsall, near Manchester,  
30; Pitlochry, 30; Plover, 107; Rens-  
30; St Andrews, 197; Swansea, 32;  
Hamstead Heath, 15  
Harborne Park, 292  
Highbury Woods, 156  
Hiebert Woods, 156

Holford Hall, Cheshire, 209  
Home Arts and Industries Association, 476  
Hornsea, 38; Huddersfield, 38; Ashton-on-Mersey, 64; Cardiff, 490; Fillingliffe, 235; Frome, 367; Gatlock, 255; Gateshead, 267; Gavelly Hill, Birmingham, 267; Grimsby, 267; Halifax, 267; Leeds, 566; Liverpool, 74, 538; London, 474; Manningham, 340; Newry, 216; Salford, 267; Sunderland, 515; Wandsworth, 267.  
**Hospitals:** Alford, 168; Auckland, 108; Barnsley, 108; Boston, 63; Brighton, 108; Bradford, 108; Burnley, 108; 466; Cockington, 515; Dewsbury, 538; Dunfermline, 400; Eltham, 566; Emsworth, 130; Foxhall, Bristol, 340; Huddersfield, 108; Ipswich, 108; Leeds, 368; Leigh, 341; Leominster, 156; 517; Liverpool, 536; London, 298, 351, 359; Manchester, 215; Newcastle, 215; Nottingham, 108; Preston, 108; Rotherham, 63; Oldham, 347; Potteries, 609; Rotherham, 63; Skipton, 255; Swansea, 415; Wakefield, 430; Whitechapel, 356; Woking, 466.  
**Hotels:** Belfast, 490; Bexhill, 235; Bristol,

London, 156, 216; Lowestoft, 195;  
Machiriahish, 139; Manchester, 215;  
Manifeth, 255; Mulion, 177, 490; Mand-  
sley, 215; Newcastle, co. Down, 14;  
New, 195; Ronger, 157; St. Mary, 349;  
Sheringham, 81; Southwold, 32;  
House: No. 16, Carlton House-terrace, 178;  
Sir John Vanbrugh's, Whitehall, 133  
Hutton Castle, Berwickshire, 156

Improvements, public: Aberdeen, 52;  
Barnoldswick, 268; Bury, 23; Bath-  
276; Bideford, 108; Birkdale, 132;  
Blackpool, 108, 391; Brighton, 276;  
Bromsgrove, 84; Cardiff, 256; Derby,  
153; Egremont, 391; Falmouth, 513;  
140, 440; Grimsby, 177; Leicester,  
368; Llandudno, 157; London, 84, 85, 109,  
110, 125, 132, 151; Manchester, 276;  
New Ferry, 440; Norwich, 156;  
Oxford, 156; Plymouth, 156; Port-  
land, 359; Scarborough, 258, 515; Shef-  
field, 431; Walsand, 237; Westminster,  
440

Incrustation, boiler, 250  
 India Office store depot, 84  
 Infirmary: Cork, 249; Dewsbury, 756;  
     Lewisham, 466; Liverpool, 590; Nor-  
     wich, 566; Redruth, 156, 216; Skip-  
     ton, 286; Stockport, 64, 474; Wakefield,  
     608; Whiston, 63  
 Institute: Bangor, 565; Catrine, 590;  
 Conselt, 566; Gateshead, 474; Gorleston,  
 466; Halthwaithe, 466; Motherwell, 254;  
 Newport, Mon., 141; Southwark, 572  
 Institutions for Technical Education, 256  
 Insurance, Builders' Accident, Ltd., 84  
 Insurance offices, London, 490  
 Interlocking girders, 592

Keepers, new, of the Royal Academy, 133  
Kelvin-cott Press, Hammersmith, 178  
King's College: plumbers' examination  
1841, prices at, 65; reports on prices, 324  
Kirkstall, Margaret and Stenton, 195

Laboratory: Bromsgrove, Birmingham, 130;  
Douglas, 83  
Laboratories, Liverpool University, 350  
Labour market in the Colonies, 323  
Land and Builders, 306  
Land Transfer Acts, 133, 610  
Land, value of City, 15  
Laundry: Blackburn Workhouse, 557;  
Cardiff, 332; Low Fell, 130; Wakefield,  
668; Wrexham, 466  
Laundries exhibition, 133  
Law Courts for Leeds, 397  
Leeds, back to back houses, 567  
Letter-box, Carr's patent, 15  
Levens, John, 190, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 96

138; Gloucester, 255; Heaton, New  
 castle-on-Tyne, 350; Liverpool, 47, 566;  
 London, 430; Manchester, 54; Middle-  
 sex, 138; Newcastle-on-Tyne, 138;  
 Ham, 439; Southwark, 14; Stockbridge,  
 Edinburgh, 156; West Ham, 39; Wick,  
 154  
 Lighthouse house, Eastbourne, 83  
 Lighthouse, St. Mary's Island, Curry Point,  
 216  
 Lining material, a round, 50, 301  
 Lino Lattice, a round, 50, 301  
 Lithographic exhibition, London, 436  
 Liverpool Town Hall ball-room, 216  
 Liverpool University laboratories, 350  
 Lloyds Bank, London, 436  
 Lloyds Bank, Aberdeen, 39; Carlisle,  
 565; Dunfermline, 51; Edinburgh, 42;  
 Leith, 500; Southampton, 131  
 London: Board Schools, 462; Bridge, con-  
 sidered, 462; City of London Council General  
 Powers Bill, 567; Hospital, the, 567;  
 School Board and contracts, 567; Sketch  
 Club, the, 370

Malmesbury Abbey, 608  
Mansion, Perth, 215  
Mansions, West-end-lane, 14  
Margate kursaal, 105  
Marine drive, Scarborough, 131  
Market: Belfast, 367; Bideford, 14; London, 83, 490  
Mar Lodge, Deeside, 131  
Marylebone workhouse, 41  
Masonic buildings: Camborne, 536; Carrickfergus, 63; Donaghadee, Belfast, 349; Greenock, 131; Leven, 367; Torquay, 536  
Matheson & Grant's engineering trades'

report, 170  
 Mayor of Exeter, the new, 454  
 Mayfair, Grosvenor chapel, 591  
 Memorial: Cartwright, Bradford, 178;  
   Christina Rossetti, 416; Creighton, 484;  
   Hemond, 484; Martineau, 484; Martyn's,  
   Canterbury, 158; Stevenson, 65; the  
   Etrick Shepherd, 157  
 Mercers, 178   Marwood, 178;  
 monument, Barnsley, 457; volunteer,  
   Exeter, 440  
 Mersey, Manchester sewage in the, 368, 391  
 Metropolitan Improvements, 85  
 Military buildings, 130  
 Mission buildings (see 'Church Building  
   News')  
 Monastic buildings of Exeter, 492  
 Monastery, Clonard, 126  
 Monuments, national, in churches, 84  
 Mud, great, 178  
 Municipal buildings: Durham, 130;  
   Govan, 207; Margate, 490  
 Mural decoration, Royal Exchange, 157  
 Murals, 169  
 Exeter, 322; Macclesfield, 348; St.  
 Albans, 108; West Bromwich, 130  
 Music Hall, Aberdeen, 565

thary: Barnes, F. 565; Bentlie,  
 Hamilton, 535, 584; Claridge, T. 535;  
 Clark, G. de Nyst. 567; Clark, Latimer,  
 413; Collin, R. W. 155; Crossin, G. W.  
 143; Davidson, 475; Depueches, T.  
 Edouard, 129; Pawcnerk, J. F. 388;  
 Fowler, Sir John, 489; Fuller, T. 366;  
 Garnier, Charles, 129, 155; Green, J.  
 K. 489; Harcourt, 475; Hargrave,  
 388; Lewis, Hayter, 565; Livesey, J. P.  
 489; Matthews, J. 23; Meredith, J. T.  
 767; Oakley, Christopher, 388; Parsons,  
 475; Parnell, 475; Parnell, 475;  
 George, 465; Prior, Axel, 50; Puviss de  
 Chevaumes, M. 388; Reah, Hudson, 82;  
 Richards, W. G. 155; Sankey, J. G.  
 535; Sinnott, 475; Smeeth, 475;  
 707; Wheatley, H. J. 475;  
 White, Gleason, 367; Wilhelm, Ludwig,  
 707; Young, J. 366

a Bailey, rebuilding of, 50  
 aces, Business, Council, Insurance,  
 Public. &c.: Brechin, 108; Bristol, 393;  
 Edinburgh, 323; Hengoed, 131; Knu-  
 tford, 349; London, 367, 490, 590;  
 nsen, 387, 589;  
 Commissioners, 136; Windermere, 130  
 nces, new Government, 84  
 pen spaces, 42, 171, 415  
 dsall Hall, near Manchester, 414  
 rgan, Liverpool, 42  
 rgan case, Essex Church, Kensington, 512  
 wens College, Manchester, 14  
 xford-street, building in, 108

nters' Company, the, 567  
 place for Archbishop of Canterbury, 157  
 1900 Exhibition, 132  
 1911 room: Cuckfield, 511; St. Helen's,  
 390  
 ark, Wallasey, 132  
 Parliament-street improvement, 38, 157  
 Patent Office, the, 105  
 patents, Australian, 256  
 patents, recent, 17, 44, 66, 85, 112, 133, 159,  
 179, 197, 217, 238, 257, 277, 299, 325, 352,  
 371, 392, 416, 441, 469, 493, 514, 541, 568,  
 593, 611  
 pavement, Roman, Leicester, 64

aving, Duley's dowered wood, 592  
 ople's Palace, Bristol, 83  
 eterborough brick trade, 415  
 topography, &c., classes for, 350  
 ictures, the Fitzroy, 457  
 re: Bexhill, 236; Morecambe, 208; New-  
 ce-on-Tyne, 606; the Tyne, 466  
 umber-class, Perth, 369; examina-  
 ions, King's College, 441  
 umber, national registration of, 237  
 outh architects and the Corporation,  
 51, 15; 532  
 ices office: Huddersfield, 297; Kilmarnock, 322; Lichfield, 64; Paignton, 275; Penze, 177; West Bromwich, 14; West-

nister, 512  
 polytechnic, Regent-street, 592  
 portrait medallion, Folkestone, 157  
 post office : Liverpool, 490 ; Perth, 42  
 prehistoric remains, Tadmorren, 80  
 remises, business, &c. : Aberdeen, 367,  
 536 ; Belfast, 511, 512 ; Birmingham, 389 ;  
 Bristol, 466 ; Coalville, 511 ; Conssett, 415 ;  
 Edinburgh, 14 ; Hucknall Torkard, 322 ;  
 London, 131, 156, 196, 415, 430 ; Lynn,  
 389 ; Perth, 512 ; Portsmouth, 235 ; Sher-  
 field, 14 ; Trafford Park, 511 ; Worcester,  
 609  
 representation to a surveyor, 427

441  
 442  
 443  
 444  
 445  
 446  
 447  
 448  
 449  
 450  
 451  
 452  
 453  
 454  
 455  
 456  
 457  
 458  
 459  
 460  
 461  
 462  
 463  
 464  
 465  
 466  
 467  
 468  
 469  
 470  
 471  
 472  
 473  
 474  
 475  
 476  
 477  
 478  
 479  
 480  
 481  
 482  
 483  
 484  
 485  
 486  
 487  
 488  
 489  
 490  
 491  
 492  
 493  
 494  
 495  
 496  
 497  
 498  
 499  
 500  
 501  
 502  
 503  
 504  
 505  
 506  
 507  
 508  
 509  
 510  
 511  
 512  
 513  
 514  
 515  
 516  
 517  
 518  
 519  
 520  
 521  
 522  
 523  
 524  
 525  
 526  
 527  
 528  
 529  
 530  
 531  
 532  
 533  
 534  
 535  
 536  
 537  
 538  
 539  
 540  
 541  
 542  
 543  
 544  
 545  
 546  
 547  
 548  
 549  
 550  
 551  
 552  
 553  
 554  
 555  
 556  
 557  
 558  
 559  
 560  
 561  
 562  
 563  
 564  
 565  
 566  
 567  
 568  
 569  
 570  
 571  
 572  
 573  
 574  
 575  
 576  
 577  
 578  
 579  
 580  
 581  
 582  
 583  
 584  
 585  
 586  
 587  
 588  
 589  
 590  
 591  
 592  
 593  
 594  
 595  
 596  
 597  
 598  
 599  
 600  
 601  
 602  
 603  
 604  
 605  
 606  
 607  
 608  
 609  
 610  
 611  
 612  
 613  
 614  
 615  
 616  
 617  
 618  
 619  
 620  
 621  
 622  
 623  
 624  
 625  
 626  
 627  
 628  
 629  
 630  
 631  
 632  
 633  
 634  
 635  
 636  
 637  
 638  
 639  
 640  
 641  
 642  
 643  
 644  
 645  
 646  
 647  
 648  
 649  
 650  
 651  
 652  
 653  
 654  
 655  
 656  
 657  
 658  
 659  
 660  
 661  
 662  
 663  
 664  
 665  
 666  
 667  
 668  
 669  
 670  
 671  
 672  
 673  
 674  
 675  
 676  
 677  
 678  
 679  
 680  
 681  
 682  
 683  
 684  
 685  
 686  
 687  
 688  
 689  
 690  
 691  
 692  
 693  
 694  
 695  
 696  
 697  
 698  
 699  
 700  
 701  
 702  
 703  
 704  
 705  
 706  
 707  
 708  
 709  
 710  
 711  
 712  
 713  
 714  
 715  
 716  
 717  
 718  
 719  
 720  
 721  
 722  
 723  
 724  
 725  
 726  
 727  
 728  
 729  
 730  
 731  
 732  
 733  
 734  
 735  
 736  
 737  
 738  
 739  
 740  
 741  
 742  
 743  
 744  
 745  
 746  
 747  
 748  
 749  
 750  
 751  
 752  
 753  
 754  
 755  
 756  
 757  
 758  
 759  
 760  
 761  
 762  
 763  
 764  
 765  
 766  
 767  
 768  
 769  
 770  
 771  
 772  
 773  
 774  
 775  
 776  
 777  
 778  
 779  
 780  
 781  
 782  
 783  
 784  
 785  
 786  
 787  
 788  
 789  
 790  
 791  
 792  
 793  
 794  
 795  
 796  
 797  
 798  
 799  
 800  
 801  
 802  
 803  
 804  
 805  
 806  
 807  
 808  
 809  
 810  
 811  
 812  
 813  
 814  
 815  
 816  
 817  
 818  
 819  
 820  
 821  
 822  
 823  
 824  
 825  
 826  
 827  
 828  
 829  
 830  
 831  
 832  
 833  
 834  
 835  
 836  
 837  
 838  
 839  
 840  
 841  
 842  
 843  
 844  
 845  
 846  
 847  
 848  
 849  
 850  
 851  
 852  
 853  
 854  
 855  
 856  
 857  
 858  
 859  
 860  
 861  
 862  
 863  
 864  
 865  
 866  
 867  
 868  
 869  
 870  
 871  
 872  
 873  
 874  
 875  
 876  
 877  
 878  
 879  
 880  
 881  
 882  
 883  
 884  
 885  
 886  
 887  
 888  
 889  
 890  
 891  
 892  
 893  
 894  
 895  
 896  
 897  
 898  
 899  
 900  
 901  
 902  
 903  
 904  
 905  
 906  
 907  
 908  
 909  
 910  
 911  
 912  
 913  
 914  
 915  
 916  
 917  
 918  
 919  
 920  
 921  
 922  
 923  
 924  
 925  
 926  
 927  
 928  
 929  
 930  
 931  
 932  
 933  
 934  
 935  
 936  
 937  
 938  
 939  
 940  
 941  
 942  
 943  
 944  
 945  
 946  
 947  
 948  
 949  
 950  
 951  
 952

Sunderland 556; Waterloo and City, 64  
railway station: Elgin, 177; Felixstowe,  
174; Glasgow, 536; Manchester, 156  
cruise destructor, Hartlepool, 512  
cruisers: Alton, Hants, 197; Kingston  
Vale, 132; Lincoln, 369; London, 476;  
Melksham, 513  
reservoir, Gainsborough, 590  
restaurant: Aberdeen, 176; Glasgow, 108  
Ridley's' Hotel, London, 216  
road: Osborn, 110; North Shields, 196  
roads, main, Dorchester, 369  
Roman baths, Bath, 84; pavement,  
Leicester, 64; villa, Darent, 250

al Academy, new, 42  
 al Academy, keeper of the, 133  
 al Commission on Sewage Disposal, 83  
 al Exchange mural decorations, 157, 324, 350  
 ssian antiquities, 178  
 Bartholomew's Hospital, Oxford, 177  
 George the Martyr, Southwark, 64  
 Marylebone workhouse, 413  
 Michael, Bassishaw Ch., 139, 391  
 les, property, 538  
 natorium : Brighton, 439, 466 ; Huddersfield, 390  
 nitary : depot, Leeds, 152 : inspector,

appointment of, 107; state of St. George S  
 the Martyr, Southwark, 64 S  
 Sanitary Inspectors' Association, 84  
 Sanitary Institute, 85  
 sh-line, braided cotton, 392 T  
 sh-pulley, wrought-steel, 65 T  
 scaffolds and ladders, patent, 15 T  
 schools: Aberayron, 246; Aberdeen, 63, T  
 83; Abergavenny, 308; Airlie, 216; T  
 Aldeby, 511; Ambie, 208; Anglesey, 156;

Barnard, Birmingham, 424; Barrow, 56;  
Barr, Ireland, 392; Bexhill, 14; Bir-  
chington, 108, 130; Birley, 414; Black-  
burn, 289; Blackburn, 289; Black-  
ridge of Weir, 267; Bristol, 208, 438;  
Brynawall, 511; Burton Latimer, 107;  
Bunnock, 511; Cardigan, 297; Castle-  
bar, 511; Castleton, 511; Chaddeld,  
Church Gresley, 108; Clacton-on-  
sea, 511; Clayton, 341; Coventry,  
7; Cowpen, 485; Crief, 14; Derby,  
511; Dorchester, 511; Donkirk, 14;  
Dunblair, 41, 83; Dudley, 130; Dun-  
dee, 511; Durham, 367, 438; Edinburgh, 130;  
Embsay, 176; Everton, 176; Falkirk, 340;  
Fechney, Perth, 510; Gainsdale, 130;  
Glasgow, 511; Glasgow, 511, 519;  
Hornfield, 207; Howe, 323; Huck-  
nall Torkard, 83; Isle of Man, 207;  
Kewick, 275; Kettleby, 63; Kilmarnock,

3: Achnaclynn, 436; Achnaclynn, 436; Achnaclynn, 436;  
 4: Lincoln, 63; Liverpool, 63;  
 5: London, 63; Lowestoft, 63;  
 6: Achnaclynn, 438; Manchester, 156;  
 7: Market Weighton, 380; Middlesbrough,  
 8: Middlesbrough, 466; Miles Platting,  
 9: Mill Hill, 40; Morley, 82; Mor-  
 10: th, 275; Motherwell, 275; Moulsham,  
 11: Nantpan, 296; Neath, 107; Newark,  
 12: Newcastle-on-Tyne, 511, 580; New-  
 13: 215, 367; Newtown, 1230; North  
 14: fields, 466; Oldham, 438; Openshaw, 141  
 15: addock, 489; Paisley, 454; Paulton,  
 16: Penarth, 63; Perram-ar-Worthal,  
 17: 13; Pokesdown, 275; Pontypool, 535;

nry, 275; Quainton, 589; Raveston,  
 266; Reading, 388; Resolven, 466;  
 hyl, 389; Romeys, 535; Rugby, 323;  
 utherglen, Glasgow, 466; St. Helen's,  
 5; Salford, 511; Scarborough, 14, 216,  
 36; Settle, 438; Sheffield, 62, 107, 512;  
 hepton Mallet, 275; Smithwick, 275;  
 dundwell, 216; Stannington, 535;  
 lockport, 489; Tong, 438; Troon, 235;  
 enton, 323; Waterloo, Liverpool, 535;  
 fawcette, Liverpool, 510; West Edg-  
 rd, 297; West Stanley, 176; West  
 iverton, 474; Whitwell, 323; Wor-  
 erton, 608; Wrexham, 389; Yarm, 255;

alms, 107  
 pool of art, wood-carving, 217  
 pools, Bond, London, 492  
 and Art Department, 394  
 ent, Chancel: Bebington, 149; Mar-  
 gate, 64; Nottingham, 195  
 : water for London, 609; encroachment,  
 eal, 177; wall, Herne Bay, 298, 566  
 age, &c., schemes: Aberdeen, 391;  
 ction, 14; Aslockton, 108; Audenshaw,  
 16; Balsall Heath, 131; Barkby, 106;  
 enwell and Fenham, 14; Blackpool,  
 18; Caerphilly, 391; Coleraire, 256;  
 nadderton, 276; Cheltenham, 177;  
 evonport, 537; Douglas, 415; Exmouth,

2; Gainford, 236; Glasgow, 186;  
Gomersal, 537; Grange, 512; Hayes,  
58; Hexham, 236; Hornsey, 39; Ip-  
swich, 108; Kirkburton, 217; Launce-  
ston, 415; Ledbury, 190; Leeds, 391;  
Leicester, 537; Manchester, 368, 391;  
Mansfield, 208; Mexborough, 323;  
Middlesbrough, 323; Morecambe, 368;  
Nibley, 133; Shrewsbury, 440; Taunton,  
10; Wivenhoe, 467.  
Age disposal, Royal Commission on, 83  
Airs, ventilation of, 132  
Canal, Great Lakes to Hudson, 216  
Fire Hall: Durham, 130; Worcester, 177

pson's, 492  
 trade, 492  
 ightenous, Blyth, 233  
 m, Bradford, demolition of, 250  
 proofing, 'Lino Lattice', 592  
 Kensington Museum, 350  
 oles, Perth, 321  
 ined Glass: Acomb, 425; Allonby,  
 29; Astbury, 276; Beaconsfield, 65;  
 edminster, 350; Belper, 440; Black-  
 pool, 42; Blundellsands, 236; Bodmin,  
 29; Bosley, 537; Bradford, 49; Bramp-  
 ington Bierlow, West Melton, 298;  
 ington, 557; Brighton, 491; Brooklands,  
 Manchester, 281; Coltness, 157; Cannes,

36; Crinken, 157; Dogmersfield, 582;  
 37; Torking, 208; Edinburgh, 42, 537, 609;  
 38; Gay Green, Peterborough, 85; Faceby,  
 39; Folkestone, 157; Glasgow, 415;  
 40; Great Bridge, 262; Handsworth, 157;  
 41; Love, 512; Jesmond, 415; Kew, 233;  
 42; Kingston Vale, 132; Lichfield, 609;  
 43; Landaff, 566; London, 15, 132, 217, 276;  
 44; Lowestoft, 157; Maids Moreton, 15;  
 45; Malton, 276; Malvern, 108; Manchester,  
 46; Morven, 537; Oldbury, 233; Perth,  
 47; Perry Barr, 298; Rollesby, 537;  
 48; Rotherfold, 440; Stow-on-the-Wold, 323;  
 49; Underland, 440, 609; Towcester, 85;  
 50;

ratur, 190; Wexlambourgh, 512; Wm  
 gester, 43, 196; Wolverhampton, 537;  
 rexham, 190  
 ls: clergy, 27; Twywell, 566; choir, St.  
 ark's, Wrexham, 176  
 ion: railway (*see* 'Railway')  
 e: Aberdeen, 298; Bridgewater, 533;  
 undee, 391; Leith, 391; Tipperary, 538  
 utes, National Portrait Gallery, Edin-  
 burgh, 237  
 rple, church, fall of a, 387  
 end: improvement, 43, 110, 138; re-  
 viving the, 217  
 et works (*see* 'Improvements')  
 sidence at Northwich, 467

ernacle, the Metropolitan, 296  
let, memorial, Elgin, 61  
s, a new water, 538  
nical education, institutions for, 256  
nical : Institute, Consett, 566 ; Insti-  
te and Library, West Ham, 349



## GENERAL (continued).—

- Technical School, Barron, 255; Boole, 216; Dorchester, 230; Harrogate, 63, 589; Leek, 280; Liverpool, 41; Lowe, 407, 466; Middlewich, 466  
Theatre, Aberdeen, 290; Barnsey, 609; Birmingham, 511; Blyth, 215; Coventry, 83; Dudley, 41; Hammersmith, 490; Hanley, 216; Harrogate, 466; Jarrow, 41; Leeds, 206, 438, 490; London, 108, 296, 296, 490, 566; Luton, 536; Margate, 172; Norwich, 439; Nottingham Hall, 511; Plymouth, 110, 230; Preston, 403; Salford, 390; Shrewsbury, 500; Sheffield, 130; Southampton, 511; Waltham Green, 230; Wolverhampton, 536  
Tintern Abbey and Raglan Castle, 157  
Tordorn, prehistoric remains at, 50  
Tower: Belper, 468; Bristol, 32; Colmonell, 155; Exeter, 438; Huddersfield, 42; Irthington, 41; North Hagbourne, 465; Pembroke, 208; Ripon, 41; Skegness, 414  
Tottenham Court-road improvement, 84  
Town Hall, Belfast, 300; Chester, 389; Colchester, 271, 415; Dundee, 414; Scarborough, 32  
Trade dinner, 84  
Tramways, Aberdeen, 324  
Underground conveniences: Birmingham, 41, 512; South Shields, 359  
Union offices (see "Offices")  
Vanbrugh's, Sir John, house, Whitehall, 133  
Ventilation of sewers, 132  
Vicars: Coboven, 295; Newland, Hull, 323; Penzance, 14  
Victoria Embankment, building on the, 438  
Volunteer buildings: Aberdeen, 83; Chesterfield, 32; Bournemouth, 414; Exeter, 440; Hertford, 83; Leven, 367; Ormskirke, 32  
Warehouse, Aberdeen, 131  
Warning, &c., Cathedral, Edinburgh, 65  
Washers, indestructible combination, 237  
Water scheme, the L.C.C., 538  
Water supply: Aberdeen, 301; Australian, 137; Chard, 298; Chesterfield, 276; Crofton, 108, 132; Derbyshire, 177; East Otterburn, 14; Goolie, 609; Harrogate, 391; High Peak, 491; Huntly, Aberdeen, 266; Kirkby-in-Ashfield, 131; Leeds, 368; Leicester, 134; Liverpool, 255; London, 296, 492, 539, 610; Maidstone, 602; Middleton 138, 132; Newport, 609; Portcawl, 590; Purleigh, 323; Wallasey, 391; Winccombe, 350; Wishaw, 555; Woluray, 14  
Water-tap, a new, 538  
Waterloo: bridge, 360; station, 43  
Waterloo and City Railway, 64  
Waterworks: Aberdeen, 285; Abergavenny, 415; Bedford, 440, 466; Bristol, 298; Coleraine, 260; Gorpley, 415; Hemsley, 131; Maidstone, 298; Morpeth, 415; Fort Glasgow, 440; Southampton, 609  
Waverley Abbey, excavations at, 591  
West Ham, building in, 438  
Westminster: Archbishop's house, 217; improvement, 440  
Wharf, coal, Bermondsey, 389  
Whitehall, Sir J. Vanbrugh's house at, 133  
Whitfield's ch., Tottenham Court-road, 380  
Window-cleaning chair, safety, 133  
Window improvements, N.A.P., 324  
Wood-carving, School of Art, 217  
Wood paving, Duff's dwelling, 592  
Workhouse: Hastings, 556; London, 41; 413; Pontefract, 255; Redruth, 156; Richmond, 511; Wolverhampton, 566  
Workmen's dwellings, Hull, 83; houses, New Boultham, Lincoln, 131  
Workshops, Brentwood, 108  
Wyatt's interlocking girders, 592  
Yarmouth Rows, condition of, 368  
Y.M.C.A., buildings: Birkenhead, 566; Northampton, 64  
York Minster, 556  
Adams, H. P., finial figures, Woolput Church, 188  
Anderson, Rowand, Central Station, Glasgow, 35  
Angus, J., the late school, Dundee, 150  
Armstrong & Knowles: Board School, Newcastle-on-Tyne, 316; business premises, Newcastle-on-Tyne, 305, 317; Telephone Company's offices, Newcastle-on-Tyne, 308  
Babb, J., Staines, Ponte Vecchio, Florence, 51  
Balfour, K., Shetkleton, design for a small country house and garden, 193  
Bates, W., Stanley, design for a timber church, 61  
Belcher, J., house, Pangbourne, 484, 485; new Guildhall, Cambridge, 210; town hall, Colchester, 584  
Bitter, Karl, bronze and iron for Biltmore, 128  
Blashitt, T., details showing change of design, Tintern Abbey, 59  
Blomfield, Reginald, professional cross, St. Paul's, London, 364  
Boucher, M., second prize in sculpture, Prix de Rome, 231; sculpture, "Philosophie de l'Histoire," 60  
Bromet & Thorman: Barnoldswick Church, Yorkshire, 56; doors to choir vestry, Tadcaster Church, 289  
Brooks, J., & Son, St. Luke's Church, Enfield, 271  
Brown, Washington, street front, Glasgow, 27  
Burnet, F., & Boston: Business premises, Glasgow, 27; chambers, Glasgow, 35  
Burnet, J., Infirmary, Glasgow, 31  
Burnet, J., J.: Athenaeum, Glasgow, 343; Barony Church, Glasgow, 34  
Campbell, J. A., premises, Glasgow, 253  
Cannon, T., Martin: Baptist Church, Dundee, 150; Church and Presbytery, St. Patrick's, Dundee, 150, 485  
Chiffot, Leon, "Palace for entertaining the illustrious guests of France," Prix de Rome Prize Design, 231  
Clapham, F., Dare, design for a convalescent home, 387  
Coe & Codwin, the Royal Infirmary, Dundee, 150  
Collins, G. W., sketches in Normandy, 211  
Cooley, A. W., the Sir John Cass Technical Institute, 80  
Coombs, W. A., & E. Towry Whyte, chancel, &c., St. Bartholomew's Church, Southsea, 211  
Cooper, C. J., Harold, Palace Gate House, Kensington Gore, 253  
Cormon, M., decorative wall paintings, Paris Natural History Museum, 274  
Cort, Virat, sculpture, "Dances Languis," 60  
Craig, V., business premises, Belfast, 458; Newtownards Presbyterian Church, Belfast, 459  
Dawber, E. Guy, private chapel, Matlock Dale, 387  
Dawber, E. Guy, & Whitwell, the White House, Moreton-in-Marsh, 607  
Dawson, Nelson & Edith: casket, silver and enamel, 11  
Dobson, J., the late, Central Station, Newcastle-on-Tyne, 306  
Doddgshan, E., J., house at Harpenden, 250  
Douglas & Sellers: Bank of Scotland buildings, Glasgow, 25; club, Glasgow, 22; Queen's Park Church, Glasgow, 24  
Drew, I., additions to St. Patrick's Cathedral, Dublin, 8, 10  
Dunn & Hanson, Durham University Medical College, Newcastle, 309  
Dunn, Hanson, & Fenwick: Board School, Newcastle-on-Tyne, 311; St. Michael's Church, Newcastle, 316  
Dunn & Watson, bridge over the Keltny Burn, 281  
Dutert, M., Natural History Museum, Paris, 270  
Duthie, A. L., design for stained glass, 585  
Eden, F. C., road screen, Bilsland Church, Cornwall, 192  
Fennell, W. J.: All Saints' Belfast, 451; Mater Infirmorum Hospital, Belfast, 459  
Field, H., three houses, Lyndhurst gardens, Hampstead, 585  
Fletcher, Banister & B. F., premises, St. Paul's Churchyard, 173  
Forbes, P. L., sketches, old Hampstead, 80  
Formelli, Cesare, decoration for room, Walsingham House, 386  
Fox, H., Hoyne, Government House, Rangoon, 432  
Fulton, J. B.: Bishop Blacader's crypt, Glasgow Cathedral, 188; stalls, Aberdeen and Dunblane, 293  
Gauquie, M., the Clairon Monument, 60  
George, Ernest, & Peto, No. 5, Collingham-gardens, 100  
Gilbert, M., Prix de Rome Prize drawing in painting, 231  
Goldie, E., Ashborne Hill House, near Leamington, 172; Hospital of SS. John and Elizabeth, St. John's Wood, 165  
Goldie, Child, & Goldie, Church of English Martyrs, York, 50  
Grafly, C., bronze bust: portrait of a lady, 128  
Green, Benjamin, the late: Bank of England, Newcastle-on-Tyne, 316; Central Exchange Buildings, Newcastle, 316  
Green, W., Curtis: Oak House, West Bromwich, 56, 151; sketches with the Architectural Assoc. excursion, 128, 129  
Greene, S. K.: a street front, Exeter, 595; west end of a town church, 259  
Gregory, E. W., examples of seventeenth century furniture, 360  
Grosvenor, H., Hampden town-hall, 50  
Guilbert, M., chapel, memorial, Rue Jean-Goussier, Paris, 104  
Hack, M. S.: facade of a town house, 230; 81 and 83, Friar-lane, Leicester, 230  
Halliday, G. E., Church of St. Michael, Langaynyd, 367  
Hardisty, W., Cecil, Christ Church, Moss-side, Manchester, 242  
Hare, H. T., "Old White House," Oxford, 51  
Hicks & Charwood: St. Matthew's Church, Newcastle-on-Tyne, 316; residences, St. Mary's Church, Newcastle, 316  
Honeyman & Kippie: Buxton's Institute, Glasgow, 26; "Herald" buildings, Glasgow, 23; school, Glasgow, 28  
Horsley, Gerald C., design for a country house, 408  
Hunter, J. K., business premises, Ayr, 105  
Ince, Howard, house at Fleet, 385  
Jackson, T. G., new chapel, Giggleswick church, 220  
Johnson, K. J., the late: Northern Assurance Company's Offices, Newcastle, 316  
Johnson, R., the late, and F. W., Rich, Durham Coll. of Science, Newcastle, 310  
Johnson, V. L., design for Campanile, 51  
Kissell, T. R.: Palazzo Publico, Siena, part of facade, 533; Plymouth Citadel, recreation and soldiers' block, 105; wall opposite Church of St. Moise, Venice, 533  
Knowles, W. H.: Jesus Hospital, Newcast., 307; the Castle, Newcastle, 304  
Koch, L. H., design for hunting lodge, 51  
Lacy, G. J., design for a gateway tower, 309; south porch, St. Nicholas, King's Lynn, 37  
Lanchester, Stewart, & Rickards, proposed Town Hall, Godalming, 433  
Lancis, J., Belfast Castle, 452; Northern Bank, Belfast, 459; Tower Buildings, Belfast, 448; warehouses, Belfast, 447  
Lanyon, Lynn & Lanyon: business premises, Belfast, 458; St. James Episcopal Church, Belfast, 459  
Lanyon, Sir C., the late: Northern Bank, Belfast, 458; Queen's College, Belfast, 458  
Lanyon, Sir C., the late, & J. Lanyon: Theological College, Belfast, 458  
Leiper, W.: Camp Hill Church, Glasgow, 34; carpet factory, Glasgow, 35; Swan Buildings, Glasgow, 35  
Lincoln, J. H.: Old Presbyterian Church, Philadelphia, 51  
Lucas, G., Public Hall and Offices, Hitchin, 61  
Lynn, W. H.: Campbell College, Belfast, 458; Carlisle Memorial Church, Belfast, 459; Free Library, Belfast, 469; Harcourt Offices, Belfast, 440, 468; Sinclair Seaborn's Church, Belfast, 459  
McGibbin, W. F., Corn Exchange, Glasgow, 24  
Marks, F. W., Design for Technical Institute, &c., West Ham, 103, 105  
Marshall, A., proposed R.C. church, Nottingham, 488  
Meaden, J. G. P., south entrance door, St. Helen's, Bishopgate, 171  
Mitchell, Arnold: cottage at Rickmansworth, 103; house at Milford, 293  
Mores, Temple, Church of St. Peter, Barnsley, Yorks, 249; interior of St. Mark's Church, Mansfield, 59  
Murray, G., design for a tomb, 128  
Murray, G., Royal Academy Prize Design, 1898; design for mural decoration and cartoon of a draped figure, 606  
Natrop, Gustav, sculpture, "Diana," 11  
Newton, Ernest: buildings at Bromley, Kent, 508; house at Wolingham, 192  
Nicoll, J. B., elevation of Wolsey Palace, Winchester, 268  
Nisbet, B. M., design for Campanile, 51  
Oakes, L., Rycroft, memorial cross and drinking fountain, Chorley, 585  
Oliver & Lleson: business premises, Newcastle-on-Tyne, 317; St. Nicholas' Cathedral, Newcastle-on-Tyne, 117  
Ower, C. & L., Park U.P. Church, Dundee, 144  
Paul, R. W.: Kilpeck Church, 223; Newark Priory, 475, 476; Tintern Abbey, 9, 10, 11  
Phillips, J. J., & Son, Bloomfield Presbyterian Church, Belfast, 459  
Piper, Stephen, Congregational Church and Hall, Newcastle-on-Tyne, 271, 272  
Pite, Hieresford, design for Colchester Town Hall, 364  
Pite, W. A.: Church of St. Columb, Lancaster-road, W., 500; stabling, Highcombe Edge, Hindhead, 189  
Potter, Bessie, plaster cast, "The Young Mother," 128  
Procter, E. J., design for stained glass, "St. Cecilia," 448  
Quennell, C. H. B., sketches, Lambeth Guild of Handicraft, 604, 605  
Ravenscroft, W.: old malt house converted into club, &c., Strealey, 81; house, G. King-on-Thames, 81  
Richard, H., office front, Great George-street, S.W., 285  
Rich, F. W.: premises, Newcastle-on-Tyne, 316; the Ouseburn schools, Newcastle-on-Tyne, 216  
Richmond, J., "Chequers model," Northaw, 51  
Robertson, J., Murray: Caledonian Insurance Company's offices, Dundee, 151; Loches Free Library and Baths, 150  
Robertson, J., Murray: Dundee, 150  
Robertson, J., Murray: St. George's Schools, Hanover-square, London, 559  
Roxes, Bone, & Colet, hotel, Bude, Cornwall, 61  
Rope, Miss E. M.: decorative bas-reliefs, sculpture, "The Kingdom of Christ," 11  
Rose, H., altar, St. Mary's, Chaddesden, 233  
Runtz, Ernest: Country House, Sutton, 249; Crown Theatre, Peckham, 408  
St. Aubyn & Wadling, east end of chapel, St. Stephen's Church, Devonport, 582  
Salmon, J., & Son, Scottish Temperance League building, Glasgow, 31  
Schenck, F. E. E., "A Triton" bas-relief panel for Shorefield Baths, 12  
Schroter, Victor, theatre, Kiew, 288, 289  
Scott, M. H., Baillie: dining-room at Palace, Darmstadt, 558; pianoforte, design for, 409  
Scott & Cawthorn, Throat and Ear Hospital, Brighton, 559  
Scott, Sir G., Glasgow University, 35  
Shaw, J., design for gates, 270  
Shewbrooks, E.: business premises, Newcastle-on-Tyne, 316; Guildhall-chambers, Newcastle-on-Tyne, 316; Home for Incapables, Newcastle-on-Tyne, 316  
Siegel, P. R., design for hunting lodge, 151  
Skipper, G. J., & F. W., Cliff Hotel, Scarborough, 323, 343  
Skippworth, A. H., chancel screen, All Saints' Church, Fulham, 173  
Slade, B., new bldgs., Clement's Inn, 512  
Spain, J. E., sepulchral slab, Rand, 360  
Sproat, W. E., sketches, Arts and Crafts Exhibition, Manchester, 404, 405  
Stalwood, S., Shingys, additions, Reading College, 211  
Stephenson, D., All Saints' Church, Newcastle-on-Tyne, 317  
Stevens, Alfred, cast-iron mantel, 33  
Stevens, F. W., the Standard Buildings, Calcutta, 365  
Tate, E., Ridsdale, Lancaster Priory, 225  
Taulman, F. M., sculpture, "Joan of Arc," 11  
Taylor, A. S., "Tarn Moor," Hindhead, 216  
Taylor, F. S., the late, Isle of Wight, 211  
Taylor, Mr., the late, the Custom House, Dundee, 150  
Thomson, A., the late, St. Vincent U.P. Church, Glasgow, 34  
Townsend, C., Harrison: "Cliff Towers," Salcombe, 329, 343  
Walker, A. G., design for mosaic in dome, Greek Church, Bayswater, 585  
Walker, Leonard, stained glass design, 409  
Ward, J. Q., A., sculpture figure, "Poetry," 121  
Waring, H. F., doorways in Queen-square, Birmingham, 126  
Waterhouse, A., King's Weigh House Parsonage, London, 162  
Waterhouse, A., & Son, Prudential Assurance Buildings, Dundee, 149  
Waterhouse, Paul, sketches of bay windows, 502, 504, 505  
Watson, J. D., "Lancaster Buildings," Glasgow, 35; U.P. Church, Glasgow, 31  
Webb, Aston, dining-room, "Paddock-bush," 412, 413  
Westlake, N. H., J., cartoons for decoration, 342  
Williams, J. L., design for mausoleum, 104  
Wilson, M., the late: Free College Church, Glasgow, 34  
Wimperis & Arber, "Hill House," Hampstead, Hants, 123  
Wuerz, H., sculpture: "A fountain of Plenty," 128  
Young, W., Town-hall, Glasgow, 34  
Younis, M., the late: Belfast Academy, 458; Evangelical Union Church, Belfast, 459; Scottish Provident Institution Buildings, Belfast, 459; warehouse, Belfast, 151

## ARCHITECTS, ETC., OF BUILDINGS ILLUSTRATED.



## ILLUSTRATIONS.

[The Illustrations will be found on, or immediately following or preceding, the pages indicated.]

- ABBEY, Lanercost: Drawn by E. Ridsdale Tate, 292  
 Abney, Intern: Details showing Change of Design, by  
 Thos. Blashill, 50  
 Abbey, Tintern: Drawn by R. W. Paul, 9, 10, 71  
 Aberdeen, Old, Stalls in King's College Chapel: Drawn by  
 J. B. Fulton, 293  
 Academy, Belfast: Young & Mackenzie, Architects, 458  
 Aldwick Studentship Drawings, by J. B. Fulton,  
 288, 293  
 Altar, St. Mary's, Chaddesden: H. Rose, Architect, 231  
 American Sculpture, Examples of, 128  
 Architectural Association Excursion Sketches, 128, 129  
 Architectural Association Silver Medal Drawings: Design  
 for Convalescent Home, by H. Dare Clapham, 387  
 Architecture, London Street (see 'Street Architecture')  
 Architecture, Mogul, of Fathpur Sikri, 222, 223  
 Arts and Crafts Exhibition, Manchester, Sketches at: By  
 W. E. Spont, 404, 405  
 Assurance Buildings (see 'Offices')  
 Athenaeum, Glasgow: J. J. Burnet, Architect, 34  
 Ayer, Business Premises: J. K. Hunter, Architect, 205
- BADESLEY CLINTON Church and Hall, 128  
 Baluster Shafts: Sketches of Saxon, 498, 499  
 Bank, Belfast: The late Sir C. Lanyon, Architect, 458  
 J. Lanyon, Architect, 459  
 Bank, Newcastle-on-Tyne: The late Benjamin Green,  
 Architect, 316  
 Bank of Scotland Buildings, Glasgow: Campbell Douglas  
 & Sellars, Architects, 255  
 Bank of Scotland, National, Glasgow, 35  
 Bank, Queensland National, Brisbane, 105  
 Barnard's Institute, Glasgow: Honeyman & Keppie,  
 Architects, 26  
 Bargemaster's, Proposed New Church: Bromet & Thorman,  
 Architects, 365  
 Barnsley, St. Peter's Church: Temple Moore, Architect, 342  
 Barracks, &c., Plymouth Citadel: T. Rogers Kitchell,  
 Architect, 105  
 Bas-reliefs, Decorative: By Miss E. M. Rope, 508  
 Bay and Oriel Windows, Sketches of: By Paul Water-  
 house, 502, 504, 505  
 Baywater, Great Church, Design for Mosaic in Dome:  
 By A. G. Walker, 585  
 Belfast Architecture, 446, 447, 448, 449, 451, 452, 458, 459  
 Bell Towers, Lincolnshire, Some Capitals in, 118, 119  
 Birmingham Archl. Assocn. Sketch from Report of, 478  
 Bishopgate, South Door, St. Helen's: Drawn by J. G. P.  
 Menden, 171  
 Blue Coat School, Read Street, F. C. Eden, Architect, 192  
 Blue Coat School, Westminster, 54  
 Bridge, Keltney Burn: Dunn & Watson, Architects, 251  
 Brighton, Throat and Ear Hospital: Scott & Cawthorn,  
 Architects, 550  
 Brisbane: Exhibition Buildings, 164; Queensland National  
 Bank, 105  
 Bromley, Buildings at: Ernest Newton, Architect, 508  
 Bude, Hotel: Rogers, Bone, & Coles, Architects, 61  
 Buildings, Bromley, Kent: Ernest Newton, Architect, 508  
 Buildings, new, Clement's Inn: Basil Slade, Architect, 532  
 Bullingham House, in which Sir Isaac Newton died, 359
- CALCUTTA, the Standard Buildings: F. W. Stevens,  
 Architect, 365  
 Cambridge, the Guildhall: John Belcher, Architect, 210  
 Campanile, Design for: by B. M. Nisbet, 51; by Virgil  
 L. Johnson, 51  
 Capitals: in Lincolnshire Bell Towers, 118, 119; two, St.  
 Mark's, Venice, 523  
 Cartoon for a Design, Figure: By George Murray, 606  
 Casket, for Decoration: By N. H. J. Westlake, 342  
 Casket, Silver and Enamel: By Nelson and Edith  
 Dawson, 11  
 Castle, Belfast: John Lanyon, Architect, 452  
 Castle Bromwich, the Entrance Porch, 128  
 Castle, the Newcastle-on-Tyne: Sketched by W. H.  
 Knowles, 304  
 Castle, St. Nicholas, Newcastle-on-Tyne: Oliver &  
 Leeson, Architects, 306, 317  
 Cathedral, St. Patrick's, Dublin: Additions: Thomas  
 Drew, Architect, 8, 10  
 Cemetery, Milan, Monuments in the, 607  
 Chambers, Guildhall, Newcastle-on-Tyne: E. Shewbrooks,  
 Architect, 316  
 Chambers, St. Vincent-street, Glasgow: F. Burnet &  
 Boston, Architects, 35  
 Chancel, &c., St. Bartholomew's Church, Southsea: W. A.  
 Coombs & E. Towry Whyte, Architects, 231, 232  
 Chancel Screen, All Saints, Fulham: A. H. Skipworth,  
 Architect, 171, 172  
 Chapel, Giggleswick School: T. G. Jackson, Architect,  
 230  
 Chapel, Memorial, Rue Jean-Goujon, Paris: M. Guilbert,  
 Architect, 104  
 Chapel, Private, Matlock Dale: E. Guy Dawber, Archi-  
 tect, 387  
 Chorley, Memorial Cross and Drinking Fountain: Design  
 by L. Rycroft Oakes, 585  
 Church, Badesley Clinton, 128  
 Church, Barnoldswick: Bromet & Thorman, Architects, 36  
 Church, Barnsley, Yorks: St. Peter's: Temple Moore  
 Architect, 342  
 Church, Belfast: All Saints': W. J. Fennell, Architect, 451  
 Church, Belfast: Bloomfield Presbyterian: J. J. Phillips  
 & Son, Architects, 450  
 Church, Belfast: Carlisle Memorial: W. H. Lynn, Archi-  
 tect, 459  
 Church, Belfast: Evangelical Union: Young & MacKenzie,  
 Architects, 459  
 Church, Belfast: Newtownbreda Presbyterian: Vincent  
 Craig, Architect, 459  
 Church, Belfast: St. James's Episcopal: Lanyon, Lynn,  
 & Son, Architects, 459  
 Church, Belfast: Sinclair Seamen's: W. H. Lynn, Archi-  
 tect, 459  
 Church, Chaddesden: St. Mary's, Altar: H. Rose, Archi-  
 tect, 231  
 Church, Design for a Timber: By W. Stanley Bates, 61
- Church, Devonport: St. Stephen's, East End of Chapel:  
 St. Aubyn & Wadling, Architects, 585  
 Church, Dundee: Baptist: T. Martin Cappon, Architect, 150  
 Church, Dundee: Park U.P.: C. & L. Ower, Architects, 144  
 Church, Dundee: St. Enoch's: T. S. Robertson, Archi-  
 tect, 150  
 Church, Dundee: St. Mary the Virgin, 150  
 Church, Dundee: St. Patrick's R.C.: T. Martin Cappon,  
 Architect, 150, 485  
 Church, Enfield: St. Luke's: J. Brooks & Son, Architects,  
 271  
 Church, Glasgow: Barony: J. J. Burnet, Architect, 34  
 Church, Glasgow: Camp Hill: W. Leiper, Architect, 34  
 Church, Glasgow: Free College: the late C. H. Wilson,  
 Architect, 34  
 Church, Glasgow: Queen's Park Established: Campbell  
 Douglas & Sellars, Architects, 34  
 Church, Glasgow: St. Vincent U.P.: the late A. Thomson,  
 Architect, 34  
 Church, Glasgow: Wellington-road U.P.: T. L. Watson,  
 Architect, 34  
 Church, Kilpeck: R. W. Paul, Architect, 123  
 Church, Llangynydd: St. Michael: G. E. Halliday,  
 Architect, 365  
 Church, London: St. Columba, Lancaster-road: W. A.  
 Pite, Architect, 230  
 Church, Manchester: Moss Side: W. Cecil Hardisty,  
 Architect, 342  
 Church, Mansfield: Interior of St. Mark's: Temple Moore,  
 Architect, 309  
 Church, Newcastle-on-Tyne: All Saints': David Stephen-  
 son, Architect, 317  
 Church, Newcastle-on-Tyne: Beech Grove Congregational:  
 Stephen Piper, Architect, 317  
 Church, Newcastle-on-Tyne: St. Matthew's: Hicks &  
 Charlewold, Architects, 316  
 Church, Newcastle-on-Tyne: St. Michael's: Dunn, Han-  
 son, & Fenwick, Architects, 316  
 Church, Nottingham, Proposed R.C.: Arthur Marshall,  
 Architects, 485  
 Church, Philadelphia: Old Presbyterian: Sketch by F. F.  
 Lincoln, 51  
 Church, Southsea: St. Bartholomew's, Chancel, &c.: W. A.  
 Coombs & E. Towry Whyte, Architects, 231, 232  
 Church, Town, Study for West End of: By S. K.  
 Greenleaf, 459  
 Church, York: English Martyrs: Goldie, Child, & Goldie,  
 Architects, 450  
 Church, Wittering: All Saints': Details, 202, 203  
 Churches, Venice, 523  
 Citizens Buildings, Glasgow: T. L. Watson, Architect, 35  
 Clement's Inn, New Buildings: Basil Slade, Architect, 532  
 Club, Glasgow: Douglas & Sellars, Architects, 22  
 Club Residence, Sreatley: W. Ravenscroft, Architect, 81  
 Colchester Town Hall: John Belcher, Architect, 584  
 Colchester Town Hall, Design for: By Beresford Pite, 364  
 College Additions, Reading: S. Slingsby Stallwood, Archi-  
 tect, 213  
 College, Campbell, Belfast: W. H. Lynn, Architect, 458  
 College, Medical, Durham University, Newcastle-on-Tyne:  
 Dunn & Hanson, Architects, 359  
 College of Science, the Durham, Newcastle-on-Tyne: the  
 late R. J. Johnson & F. W. Rich, Architects, 310  
 College, Presbyterian Theological, Belfast: the late Sir  
 C. Lanyon & J. Lanyon, Architects, 458  
 College, Queens', Belfast: the late Sir C. Lanyon, Archi-  
 tect, 458  
 College, Queen's, Cambridge: From a Sketch in the  
 Birmingham & A. Rort, 478  
 Colston's Hall, Bristol: Plan, 574  
 Convalescent Home: Design for: by F. Dare Clapham, 387  
 Co-operative Society's Premises, Newcastle-on-Tyne: F.  
 W. Rich, Architects, 165  
 Court, Rickmansworth: Arnold Mitchell, Architect, 193  
 Cottage House, Dundee, 143  
 Cross, Memorial, and Drinking Fountain, Chorley: Design  
 by L. Rycroft Oakes, 585  
 Cross, Processional, St. Paul's, London: Designed by  
 Reginald Blomfield, 364  
 Crpy, Bishop Blacader's, Glasgow Cathedral: Drawn by  
 J. B. Fulton, 288  
 Custom House, Dundee: 150
- DARMSTADT, Dining-room at Palace: M. H. Baillie  
 Scott, Architect, 585  
 Decoration, Cartoons for: By N. H. J. Westlake, 342  
 Decoration, Design for Mural: By George Murray, 606  
 Decoration, Wall and Ceiling, Walsingham House: By  
 Cesare Formili, 386  
 Decorative Bas-reliefs: By Miss E. M. Rope, 508  
 Deir-el-Bahari: Illustrations to Mr. Newberry's Paper at  
 the Architectural Association, 469  
 Devonport, St. Stephen's Church: East End of Chapel,  
 St. Aubyn & Wadling, Architects, 585  
 Diagrams: Hot-water Heating Apparatus, 376, 377; illus-  
 trating Tank and Cistern Construction, 397, 398; New  
 Water Tap, 538; Safety Window-cleaning bar, 133;  
 Stage Construction, 72, 73; Students' Column, 234  
 Dining-room at Palace, Darmstadt: M. H. Baillie Scott,  
 Architect, 585  
 Dining-room, 'Paddockhurst': Aston Webb, Architect, 432  
 Door, South, St. Helen's, Bishopgate: Drawn by J. G. P.  
 Menden, 171  
 Doors to Choir Vestry, Tadcaster Church: Bromet &  
 Thorman, Architects, 288  
 Doorway, St. Mark's, Venice, 523  
 Doorways in Queen-square, Bloomsbury: Drawn by H. F.  
 Waring, 126  
 Dublin, St. Patrick's Cathedral: Additions, Thomas Drew,  
 Architect, 8, 10  
 Dudhope Castle, Dundee, 140  
 Dunblane Cathedral: Stalls, Drawn by J. B. Fulton, 293  
 Dunblane Architecture, 140, 141, 142, 143, 144, 145, 150,  
 151, 485  
 Durham College of Science, Newcastle-on-Tyne: the late  
 R. J. Johnson & F. W. Rich, Architects, 310  
 Durham University Medical College, Newcastle-on-Tyne:  
 Dunn & Hanson, architects, 309
- ENFIELD, St. Luke's Church: James Brooks & Son,  
 Architects, 271  
 Exchange Buildings, Central, Newcastle-on-Tyne: the  
 late Benjamin Green, Architect, 316  
 Exchange, Corn, Glasgow: W. H. McGibbon, Architect, 24  
 Exeter, Street Front: S. K. Greenleaf, Architect, 559  
 Exhibition Buildings, Brisbane, 164
- FACTORY, Carpet, Glasgow: W. Leiper, Architect, 35  
 Fathpur Sikri, Mogul Architecture of, 222, 223  
 Figure, Draped Cartoon for: By George Murray, 606  
 Final Figures, Woolpit Ch.: Sketched by H. P. Adams, 188  
 Fleet, House at: Howard Ince, Architect, 386  
 Florence, Ponte Vecchio: Drawn by J. Staines Babb, 558  
 French Wood-carving, 222, 223  
 Fulham, All Saints' Church: Chancel Screen: A. H.  
 Skipworth, Architect, 173  
 Furniture, Examples of Seventeenth-century: Drawn by  
 E. W. Gregory, 180
- GATES, Design for: By J. J. Shaw, 270  
 Gateway Tower, leading to College Quadrangles: Royal  
 Academy Prize Design, by G. J. J. Lacy, 509  
 Giggleswick School, New Chapel: T. G. Jackson, Archi-  
 tect, 230  
 Glasgow Architecture, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34,  
 35, 253  
 Glasgow Cathedral, Bishop Blacader's Crypt: Drawn by  
 J. B. Fulton, 288  
 Glass, Stained, Design for: By A. L. Dutchie, 585;  
 Leonard Walker, 409  
 Godalming, 'Northanger': F. T. Baggallay, Architect,  
 343  
 Godalming Town Hall: Selected Design, by Lancheater,  
 Stewart, & Rickards, 433  
 Goring-on-Thames, House: W. Ravenscroft, Architect, 81  
 Goring-on-Sea: the Cliff Hotel, G. J. & F. W. Skipper,  
 Architects, 60  
 Government House, Rangoon: H. Hoyle Fox, Architect,  
 432  
 Greek Church, Bayswater: Design for Mosaic in Dome,  
 by A. G. Walker, 585  
 Grissell Medal of Merit: Design for a Timber Church, by  
 W. Stanley Bates, 61  
 Guildhall, Cambridge: John Belcher, Architect, 210
- HALLS near Leamington, visited by the Architectural  
 Association, 128, 129  
 Hamburg Town-hall: Herr Crojan, Architect, 250  
 Hampstead Heath, 'Hill House': Wimperis & Arber,  
 Architects, 193  
 Hampstead, Old, Sketches of: By P. L. Forbes, 80  
 Hampstead, Three Houses: Horace Field, Architect, 585  
 Handicraft, work done by Lambeth Guild of, 604, 605  
 Harbour Offices, Belfast: W. H. Lynn, Architect, 446, 458  
 Harpenden, House at: E. J. Dodgshun, Architect, 210  
 'Harvest', Design for Mural Decoration: By George  
 Murray, 606  
 Herald Buildings, the, Glasgow: Honeyman & Keppie,  
 Architects, 23  
 Hindhead, Highcombe Edge: Stabling: W. A. Pite,  
 Architect, 189  
 Hindhead, 'Tarn Moor': A. S. Taylor, Architect, 210  
 Hitchin Town-hall: G. Lucas, Architect, 61  
 Home, Design for Convalescent: By H. Dare Clapham,  
 387  
 Home for Incapables, Newcastle-on-Tyne: E. Shewbrooks,  
 Architect, 316  
 Hospital, Jesus, Newcastle-on-Tyne, 307  
 Hospital, Mater Infirmitum, Belfast: W. J. Fennell,  
 Architect, 459  
 Hospital, SS. John and Elizabeth, St. John's Wood: E.  
 Goldie, Architect, 364  
 Hospital, Throat and Ear, Brighton: Scott & Cawthorn,  
 Architects, 559  
 Hot-water Heating Apparatus Diagrams, 376, 377  
 Hotel, Bude, Cornwall: Rogers, Bone, & Coles, Archi-  
 tects, 61  
 Hotel, Isle of Wight: F. S. Taylor, Architect, 211  
 Hotel, the Cliff, Goring-on-Sea: G. J. & F. W. Skipper,  
 Architects, 60  
 House, 'Ashorne Hill', near Leamington: E. Goldie,  
 Architect, 172, 173  
 House, Avonmore road, London, 266  
 House, Bramham-gardens, London, 208  
 House, Bullingham, in which Sir Isaac Newton died, 359  
 House, 'Cliff Towers' Salcombe: C. Harrison Townsend,  
 Architect, 230, 243  
 House, Collingham-gardens, London: Ernest George &  
 Peto, Architects, 100  
 House, Design for a Country, Gerald C. Horsley, Archi-  
 tect, 408  
 House, Fleet: Howard Ince, Architect, 386  
 House, Godalming: F. T. Baggallay, Architect, 343  
 House, Goring-on-Thames: W. Ravenscroft, Architect, 81  
 House, Hampstead Heath: Wimperis & Arber, Archi-  
 tects, 193  
 House, Harpenden: E. J. Dodgshun, Architect, 210  
 House, Hindhead: A. S. Taylor, Architect, 210  
 House, Milford: Arnold Mitchell, Architect, 193  
 House, Moreton-in-the-Marsh: E. Guy Dawber & Whit-  
 well, Architects, 607  
 House, Northaw: John Richmond, Architect, 81  
 House, Oxford: H. T. Hare, Architect, 81  
 House, Palace-gate, Kensington: C. J. H. Cooper, Archi-  
 tect, 251  
 House, Pangbourne: John Belcher, Architect, 484, 485  
 House, Sutton: Ernest Runtz, Architect, 249  
 House, the Oak, West Bromwich: Drawn by W. Curtis  
 Green, 56, 151  
 House, Town, Façade of: M. S. Hack, Architect, 230  
 House, Wokingham: Ernest Newton, Architect, 192  
 House and Garden, Design for Small Country: By R.  
 Shekleton Balfour, 193  
 Houses, Three, Hampstead: Horace Field, Architect, 585  
 Hunting Lodge, Design for: By L. H. Koch, 51; By F.  
 R. Siegel, 51



## ILLUSTRATIONS (continued).—

- INFIRMARY, Dundee: Coe & Godwin, Architects, 150  
 Infirmary, Western, Glasgow: John Burnett, Architect, 35  
 Institute, Technical, Dundee: J. Murray Robertson, Architect, 145  
 Institute, Technical, the Sir John Cass: A. W. Cooksey, Architect, 80  
 Institute, Technical, West Ham: Design by F. W. Marks, 101, 103  
 Insurance Buildings (See 'Offices')  
 Isle of Wight Hotel: F. S. Taylor, Architect, 211
- KELTNEE BURN**, Bridge over the: Dunn & Watson, Architects, 251  
 Kiew Theatre: Victor Schroeter, Architect, 228, 229  
 Kilpeck Church, Herefordshire: R. W. Paul, Architect, 123  
 King's Lynn, S. Porch, St. Nicholas: Drawn by G. J. J. Lacy, 17  
 King's Weigh House Parsonage, Thomas-street, London: Alfred Waterhouse, Architect, 169
- LAMBETH GUILD OF HANDICRAFT**: Sketches, 601, 605  
 Lanercost Priory: Drawn by E. Ridsdale Tate, 292  
 Library, Free, Loches, Dundee: J. Murray Robertson, Architect, 150  
 Lincolnshire Bell Towers, some Capitals in, 118, 119  
 Llangwyl, St. Michael's Church: G. E. Halliday, Architect, 162  
 Loches Free Library, Dundee: J. Murray Robertson, Architect, 150  
 London Street Architecture (See 'Street Architecture')
- MALTHOUSE**, Old, Srealeigh, Converted into Club, &c.: W. Ravenscroft, Architect, 81  
 Manchester Arts and Crafts Exhibition, Sketches at: By W. E. Spreat, 404, 405  
 Manchester, Christ Church, Moss Side: W. Cecil Hardisty, Architect, 242  
 Mansfield, St. Mark's Church, Interior: Temple Moore, Architect, 509  
 Mantel, Castiron: Modelled by Alfred Stevens, 23  
 Matlock Dale, Private Chapel: E. Guy Dawber, Architect, 387  
 Mausoleum, Design for a: By J. L. Williams, 104  
 Maxtroke Castle, 129  
 Medal Presented to William and Mary on their Accession, 257  
 Memorial Chapel, Rue Jean-Goujon, Paris: M. Guilbert, Architect, 104  
 Milan, Monuments in the Cemetery, 607  
 Milford, House at: Arnold Mitchell, Architect, 193  
 Mogul Architecture of Farhup Sikri, 222, 223  
 Moreton in the Marsh, the White House: E. Guy Dawber & Whitwell, Architects, 607  
 Monument, the Clairon, Condé-sur-Escaut: M. Gauquie, Sculptor, 60  
 Mosaic in Dome, Greek Church, Bayswater: By A. G. Walker, 515  
 Mural Decoration, 'Harvest,' Design for: By George Murray, 606  
 Museum, New Natural History, Paris: Decorative Wall Paintings, By M. Cormon, 271; Façade, M. Dutert, Architect, 270
- NEWARK PRIORY**, Plan and Details: Drawn by R. W. Paul, 475, 476  
 Newcastle-on-Tyne Architecture, 271, 272, 304, 305, 306, 307, 308, 309, 310, 311, 316, 317  
 Newton, Sir Isaac, House in which he died, 359  
 Normandy, Sketches in: By G. W. Collins, 211  
 Northaw, House: John Richmond, Architect, 81  
 Nottingham, Proposed R.C. Church: Arthur Marshall, Architect, 485
- 'OAK' HOUSE**, West Bromwich: Drawn by W. Curtis Green, 56, 151  
 Office Front, Great George-street, Westminster: Halsey Ricardo, Architect, 285  
 Offices, Caledonian Insurance, Dundee: J. Murray Robertson, Architect, 151  
 Offices, &c., Co-operative Wholesale, Newcastle-on-Tyne: Oliver & Leeson, Architects, 317  
 Offices, National Telephone Co.'s, Newcastle-on-Tyne: Armstrong & Knowles, Architects, 308  
 Offices, Northern Assurance Co.'s, Newcastle-on-Tyne: the late R. J. Johnson, Architect, 316  
 Offices, Prudential Assurance, Dundee: A. Waterhouse & Son, Architects, 142  
 Oxford, 'Old White House': H. T. Hare, Architect, 81
- 'PADDOCKHURST'**, Dining-room: Aston Webb, Architect, 439, 433  
 'Palace for Entertaining the Illustrious Guests of France': Design by Leon Chiffot, 231  
 Palace, Wolvesey, Winchester: Elevation: Drawn by J. B. Nicol, 268  
 Palaces, Venice: Grimani & Rezzonico, 532
- Palazzo Publico, Siena, Portion of Wall: Drawn by T. R. Kitsell, 533  
 Panel, Plaster, Rotherhithe Town Hall: By Miss E. M. Rope, 308  
 Pangbourne, House at: John Belcher, Architect, 484, 485  
 Paris, Memorial Chapel, Rue Jean-Goujon: M. Guilbert, Architect, 104  
 Paris, New Natural History Museum: Façade of M. Dutert, Architect, 270; Decorative Wall Paintings, by M. Cormon, 271  
 Paris, 'Prix de Rome' Prize Designs, 231  
 Paris Salon Sculpture (See 'Sculpture')  
 Parsonage, the King's Weigh House, Thomas-street, London: Alfred Waterhouse, Architect, 169  
 Peckham, Crown Theatre: E. A. Runtz, Architect, 408  
 Pennsylvania University, School of Architecture of the, Sketches from Year-Book of the, 41  
 Pianoforte, Design for: M. H. Baillie Scott, Architect, 409  
 Plan: Colston's Hall, Bristol, 574; Lanercost Priory, 292; St. Martin's, Canterbury, 52, 174  
 Plymouth Citadel, Recreation and Soldiers' Block: T. Rogers Kitsell, Architect, 105  
 Poete Vecchio, Florence: Drawn by J. Staines Babb, 558  
 Porch, St. Nicholas, King's Lynn: Drawn by George J. J. Lacy, 387  
 Premises, Bromley: Ernest Newton, Architect, 508  
 Premises, Business, Aprt: J. K. Hunter, Architect, 105  
 Premises, Business, Belfast: V. Craig, Architect, 458; Lanyon, Lynn, & Lanyon, Architects, 458  
 Premises, Business, Glasgow: F. Burnet & Boston, Architects, 27; J. A. Cambell, Architect, 213  
 Premises, Business, Leicester: M. S. Hack, Architect, 230  
 Premises, Business, Newcastle-on-Tyne: Armstrong & Knowles, Architects, 305, 317; Oliver & Leeson, Architects, 317; F. W. Rich, Architect, 316; E. Shewbrooks, Architect, 316  
 Premises, Business, St. Paul's Churchyard: Banister Fletcher & B. F. Fletcher, Architects, 173  
 Priory, Lanercost: Drawn by E. Ridsdale Tate, 292  
 Priory, Newark: Plan and Details, Drawn by R. W. Paul, 475, 476  
 'Prix de Rome' Prize Designs, Paris, 231  
 Processional Cross, St. Paul's, London: Designed by Reginald Blomfield, 364
- RAM HALL**, 129  
 Rand, Sepulchral Slab: Drawn by I. E. Spain, 260  
 Rangoon Government House: H. Hoynes Fox, Architect, 427  
 Reading College, Additions to: S. Slingsby Stallwood, Architect, 211  
 Reredos, St. Mary's Church, Newcastle-on-Tyne: Hicks & Charlewold, Architects, 316  
 Rickmansworth, Cottage: Arnold Mitchell, Architect, 193  
 Roof-Screen, Bilsland Church: F. C. Eden, Architect, 192  
 Rotherhithe Town Hall: Plaster Panel, by Miss E. M. Rope, 308  
 Royal Academy Prize Design: A Gateway Tower, by G. J. J. Lacy, 509  
 Royal Academy Prize Design: Mural Decoration, by George Murray, 606  
 Royal Academy Sculpture (See 'Sculpture')
- ST. JOHN'S WOOD**, Hospital: E. Goldie, Architect, 365  
 St. Patrick's Cathedral, Dublin: Additions, Thomas Drew, Architect, 8, 10  
 St. Paul's Cathedral: Processional Cross, Designed by Reginald Blomfield, 364  
 St. Paul's Churchyard, New Premises: Banister Fletcher & B. F. Fletcher, Architects, 173  
 School, Dundee: the late J. Angus, Architect, 150  
 School, Glasgow: Honeyman & Keppie, Architects, 28  
 School, Newcastle-on-Tyne: Armstrong & Knowles, Architects, 316; Dunn, Hanson, & Fenwick, Architects, 311; F. W. Rich, Architect, 316  
 Schools, St. George's, Hanover-square: P. A. Robson, Architect, 559  
 Scottish Provident Institution Buildings, Belfast: Young & Mackenzie, Architects, 459  
 Scottish Temperance League Building, Glasgow: J. Salmon & Son, Architects, 30  
 Screen, Chancel, All Saints' Church, Fulham: A. H. Skipworth, Architect, 173  
 Screen, Rood, Bilsland Ch.: F. C. Eden, Architect, 192  
 Sculpture, American, Examples of, 128  
 Sculpture at the Royal Academy: 'A Triton,' F. E. E. Schenck, Sculptor, 12; 'Casket, Silver and Enamel, by Nelson and Edith Dawson, 11; 'Diana,' by Gustav Natorp, 11; 'Joan of Arc,' by F. M. Taubman, 11; 'The Kingdom of Christ,' by Ellen M. Rose, 11  
 Sculpture Design, Prix de Rome: by M. Boucher, 231  
 Sculpture from the Paris Salon: 'Douce Langueurs,' Vital Cornu, Sculptor, 60; 'Philosophie de l'Histoire,' M. Boucher, Sculptor, 60; the Clairon Monument, M. Gauquie, Sculptor, 60  
 Shoreditch Public Baths: Bas-relief Panel for, by F. E. E. Schenck, 12  
 Siena, Palazzo Publico, Portion of Façade: Drawn by T. R. Kitsell, 533
- Sketches at the Arts and Crafts Exhibition, M. Dutert, By W. E. Spreat, 404, 405  
 Sketches in Normandy: By G. W. Collins, 211  
 Sketches, Lambeth Guild of Handicraft, 601, 605  
 Sketches of Old Hampstead: By P. L. Forbes, 80  
 Sketches of Saxon Balustrade Shafts, 498, 499  
 Slab, Sepulchral, Rand: Drawn by J. E. Spain, 260  
 Soldiers' Block, &c., Plymouth Citadel: T. Rogers Kitsell, Architect, 105  
 Southsea, Chancel, &c., St. Bartholomew's Church: W. A. Coombs & E. Towry Whyte, Architects, 231, 232  
 Stabling, Highcombe Edge, Hindhead: W. A. Pite, Architect, 169  
 Stage Construction Diagrams, 72, 73  
 Stained Glass, Design for: By A. L. Duthie, 535; By Edward J. Procter, 458; By Leonard Walker, 409  
 Stained-glass Window, Concerning, 262, 263, 264  
 Stalls, Dunblane Cathedral and King's College Chapel, Old Aberdeen: Drawn by J. B. Fulton, 293  
 Standard Bldg., Calcutta: F. W. Stevens, Architect, 365  
 Station, Central Railway, Glasgow: Rowand Anderson, Architect, 35  
 Station, Central Railway, Newcastle-on-Tyne: the late John Dobson, Architect, 366  
 Stretealy, Club and Residence: W. Ravenscroft, Architect, 51  
 Street Architecture, Sketches of London: House, Avonmore-road, 266; House, 12, Bramham-garden, S.W., 208; House, Collingham-gardens, Ernest George & Pena, Architects, 100; King's Weigh House Parsonage, Thomas-street, London: Alfred Waterhouse, Architect, 169; Office Front, Gt. George-street, Halsey Ricardo, Architect, 285  
 Street Front for Exeter: S. K. Greenleaf, Architect, 559  
 Street Front, Glasgow: Washington Browne, Architect, 29  
 Swan Buildings, Glasgow: W. Leiper, Architect, 35  
 Sutton, Country House: Ernest Runtz, Architect, 249
- TADCATER CHURCH**, Doors to Choir Vestry: Bromet & Thorman, Architects, 289  
 Technical Institute, Dundee: J. Murray Robertson, Architect, 145  
 Technical Institute, the Sir John Cass: A. W. Cooksey, Architect, 80  
 Technical Institute, West Ham: Design by F. W. Marks, 103, 105  
 Theatre, Crown, Peckham: E. A. Runtz, Architect, 408  
 Theatre, Kiew: Victor Schroeter, Architect, 228, 229  
 Thebes, Excavations at, 407  
 Tintern Abbey: Details showing Change of Design, by Thos. Blashill, 9  
 Tintern Abbey: Drawn by R. W. Paul, 9, 10, 11  
 Tower, Gateway, leading to College Quadrangle: Royal Academy Design, by G. J. J. Lacy, 409  
 Town Church, West End of A: by S. K. Greenleaf, 559  
 Town Hall, Colchester: John Belcher, Architect, 584  
 Design for, by Biersford Pite, 364  
 Town Hall, Glasgow: W. Young, Architect, 34  
 Town Hall, Godalming: Selected Design, by Lanchester, Stewart, & Richards, 433  
 Town Hall, Hamburg: Herr Grotjan, Architect, 250  
 Town Hall, Hitchin: G. Lucas, Architect, 61  
 Town House, Dundee, 141  
 Tyffe's Building, Nethergate, Dundee: J. Murray Robertson, Architect, 151
- UNIVERSITY**, Glasgow: Sir G. Scott, Architect, 35
- VENICE**, Illustrations of, 523, 524, 533  
 Venice, Wall Opposite the Church of S. Moisè: Drawn by T. R. Kitsell, 533
- WALL PAINTINGS**, Decorative, Natural History Museum, Paris: By M. Cormon, 271  
 Walsingham House, Wall and Ceiling Decoration for Room at: By Cesare Formili, 385  
 Warehouses, Belfast: J. Lanyon, Architect, 447, 448; Young & Mackenzie, Architects, 251  
 Warwick, Sketches in, 129  
 West Bromwich, the Oak House: Drawn by W. Curtis Green, 56, 151  
 West Ham Technical Institute, &c.: Design by F. W. Marks, 103, 105  
 Westminster, Old Blue Coat School, 24  
 Winchester, Wolvesey Palace: Elevation, Drawn by J. B. Nicol, 268  
 Windows, Bay and Oriol, Sketches of: By Paul Waterhouse, 501, 504, 507  
 Windows, Stained Glass, 262, 263, 264  
 Wittering All Saints': Details, 202, 203  
 Wokingham, House at: Ernest Newton, Architect, 100  
 Wolvesey Palace, Winchester: Elevation, Drawn by J. B. Nicol, 268  
 Wood Carving, French, 242, 243  
 Woolpit Church, Final Figures: Sketched by H. Percy Adams, 128
- YORK**, Church of English Martyrs: Goldie, Child, & Goldie, Architects, 250





## ILLUSTRATIONS.

View showing Proposed Additions to St. Patrick's Cathedral, Dublin.—Mr. Thomas Drew, R.H.A., Architect ..... *Extra Large Page Photo-Litho.*  
 The Abbaye of Great Britain.—XXVI. Tintern. Drawn by Mr. R. W. Paul..... *Double-Page Photo-Litho.*  
 Ground Plan, Tintern Abbey. Measured and Drawn by Mr. R. W. Paul..... *Double-Page Photo-Litho.*  
 Sculpture at the Royal Academy:—  
 "Joan of Arc," by Mr. F. M. Taubman; "Diana," by Mr. G. Natorp; Casket, Silver and Enamel, by Nelson and Edith Dawson; and "The Kingdom of the Child," by Miss E. M. Rope..... *Two Single-Page Ink-Photos.*

## Blocks in Text.

Plan of Proposed Additions to St. Patrick's Cathedral, Dublin ..	Page 8
Tintern Abbey:—	
1. Fireplace in the "Warming House".....	" 9
2. Hatch between Frater and Kitchen .....	" 9
3. Pulpit Entrance in Frater .....	" 9
Doorway from Nave to Cloister .....	" 9
The North Transept and Presbytery, from the "Day Room" ..	" 30

Tintern Abbey (continued):—	
The West Front .....	Page 11
Window at South End of "Cellarium" .....	" 11
Heraldic Tiles now in Sacristy .....	" 11
"A Triton". Bas-relief Panel for Shoreditch Public Baths.—	
Mr. F. E. E. Schenck, Sculptor .....	" 12

## CONTENTS.

Technical Education in France.....	1	St. Patrick's Cathedral, Dublin .....	8	Sanitary and Engineering News .....	14
The Sculpture Exhibition in New York.....	2	Tintern Abbey .....	9	Stained Glass and Decoration .....	25
Notes .....	3	Sculpture at the Royal Academy .....	11	Foreign .....	25
Architecture at the Royal Academy.—IV. ....	5	Carpenters' Company Examinations .....	12	Miscellaneous .....	25
The Royal Institute of British Architects .....	5	Books Received .....	12	Capital and Labour .....	25
French Architectural Societies, and the Congress of French Architects .....	6	The Institute Scale of Charges .....	12	Legal .....	25
The London County Council .....	7	The Geological Museum .....	12	Meetings .....	27
Architectural Societies .....	7	Water Tank .....	12	Recent Patents .....	17
Competitions .....	7	The Students' Column: Sound, Light, and Heat.—I. ....	12	Some Recent Sales of Property .....	17
Applications under the 1894 London Building Act .....	7	Obituary .....	13	Prices Current of Materials .....	19
		General Building News .....	13	Tenders .....	19

## Technical Education in France.



HERE is no doubt that this country is behind others in technical education. In all probability, sooner or later, there will be an advance in this respect; but we fear that the mass of the population, which forms the volume of opinion by which pressure is brought on a government, is too content with things as they are. Every kind of information in regard to what is being done in other countries on this subject is therefore valuable, and no publication will be of more use than the Report which has recently been made on technical education in France by Mr. C. C. Perry.\* It contains a great deal of information in a small compass, and should be perused by all who are interested in this subject.

Perhaps the most consoling thing about this Report is the evidence which it affords of the difficulty of establishing a system of technical education, and it may make those in this country who are working for that end more hopeful, as showing that our present condition of backwardness may be somewhat excused by the radical difficulties of the subject, and that, even in a country like

France, where it is much easier than it is here to establish new systems, it has not been found easy to create a proper system of technical education.

Technical education in France really dates from the law of May, 1880. By it a new order of schools, "Écoles Manuelles d'Apprentissage," were established, which aimed at providing general technical instruction. Their object was to develop in youths intended for manual trades the requisite dexterity and technical knowledge. To these were assimilated the Higher Grade Primary Schools, in which there were courses of technical instruction, and the law placed both kinds of schools under the joint control of the Ministers of Public Instruction and of Agriculture and Commerce—the very thing to prevent the effective working of the new system.

In 1888 came a further law, which sought to make this dual system more workable, and made the cost of all these schools a charge partly on the Ministry of Instruction and partly on the Department or the Commune, depending on whether the school is Departmental or Communal. In the same way the governing body is partly local and partly governmental, but the syllabus is in theory laid down by the two Ministers, though it would appear that in practice the course of work and study is largely modified by local requirements and needs.

But these schools did not meet the needs of the country. The apprenticeship schools could scarcely be said to exist; the other class was rather commercial than technical. On the other hand, three important purely

technical schools: those at Vierzon, Voiron, and Armentières had, in 1886 and 1887, been established as the result of various decrees. They are wholly national as distinguished from local or local-national, and comprise an infant school, an elementary school, and a higher elementary technical school. There is in them a certain amount of what may be called technical education, even of the most rudimentary kind, from the beginning; and so it may be said that technical education is entered upon at an early age side by side with ordinary education. Thus "the above schools may be regarded as representing the highest ideal formed by the French State of a combined general and technical education. They stand as the official solution of a difficult, if not insoluble problem" (p. 6). It was probably in consequence of the satisfaction felt by the Government at these schools that a law was passed in 1892, "which created an entirely new category of schools, under the name of Écoles Pratiques de Commerce ou d'Industrie." The object of these latter schools is to form clerks and workmen who may at once be utilised in the counting house and the workshop. They are governed by a Special Council, though the director of the school is directly responsible to the Minister of Education, and the appointment of the staff rests with the latter official on the nomination of the Prefect or Mayor. In 1897 there were three thousand one hundred and twenty-five pupils in these schools, which numbered twenty-two. When, however, we come to regard the different schools which fall into one or other of the previous classes we are struck

\* "French Technical Education." Report to the Science and Art Department on Recent Progress of French Technical Education. By Charles Copland Perry, M.A. London, 1898.




both with the extent of their diversity and with the manner in which they seem to differ, one having made a speciality of one kind of technical teaching, another of another, such as the *École Nationale des Arts Décoratifs* at Paris, which, with two others in the capital, is given up to the application of decorative art to practical matters.

The truth appears to be that local circumstances and local industries largely govern the character of these different schools. The main point for us in this country to realise is that the course of technical education in France has been, as is clear from the slight sketch just given, very uncertain and very tentative. On the other hand, it is equally clear that for the last five-and-twenty years the Government of France has steadily been doing its best to establish such a system of technical teaching as will fit French men and women to take a high part in the technical and industrial work of the world. It has succeeded in creating a number of institutions where there is good technical teaching, and there has been a development of a movement having for its aim the approximation of the school to the workshop. But it requires either a visit to one of these schools or a very detailed inquiry to say whether this school or that carries out its work satisfactorily.

What, however, we have endeavoured to do in the previous remarks is not to criticise the actual work of French technical schools, but to give a short outline of the existing system and its growth. Those who desire to go more into detail will be able to do so by perusing the Report which we have already referred to, and which can be purchased for a trifling sum.

#### THE SCULPTURE EXHIBITION IN NEW YORK.

(BY AN AMERICAN CONTRIBUTOR.)

HE exhibition of the National Sculpture Society, which has recently come to an end in New York, may rightly be judged one of the most ambitious and successful efforts to exhibit the art of sculpture suitably and artistically envired, that has been undertaken in recent years. An exhibition of sculpture is so generally associated with the idea of a single corridor or sparsely filled room,\* that an exhibition of this art, filling several extensive galleries and placed in an architectural and floral setting, would, in any event, command attention and excite interest. That this should have been accomplished twice in the city of New York, once in 1895 and again in the current year, is a testimony to the activity of the Society under whose auspices it was held, as well as evidence of the vitality of the art of sculpture in the States.

The National Sculpture Society is an American organisation originated as recently as 1893, and composed of sculptors and laymen; among the latter are many artists, architects, painters, and decorators, but sculptors alone have professional rank and standing in the Society. Each grade has equal privileges, save that the President must always be a sculptor, and one of the

Vice-Presidents an architect. The business of the Society is conducted by an executive board called the Council, composed of eighteen members, of whom six are chosen each year by the Society at large, and of whom, at each election, at least two must be sculptors and one an architect. The relationship between sculpture and architecture is thus very clearly emphasised in the organisation and administration of the Society.

It is obvious that, in any country, and perhaps in America most of all, where, prior to the display at the Chicago Exhibition in 1893, the value of sculpture in its architectural relationship was scarcely understood or appreciated, the relative number of sculptors must be very small. Important as a society of sculptors might be from the standpoint of the professional artist, it could scarcely hope to have much weight, owing to the essential limitations of its membership. The addition of lay members, therefore, provided the Society with a ready means of greatly extending its membership, and hence its importance in the eye of the public; and the restrictions placed upon that membership were so slight that cultivated amateurs, artists in other professions, and any one interested at all in sculpture, would feel every inducement to become connected with so worthy an organisation. So far, this union of laymen and sculptors in a single body has proved most successful, and while the lay members are more than four times as numerous as the professional members, the Society has found them a valuable source of strength, and has retained its strictly sculptural character without any loss of dignity. This is the more remarkable, since most of the art societies in New York are strictly limited to professional membership.

The purposes of the Society, as defined by its constitution, are "to spread the knowledge of good sculpture, foster the taste for, and encourage the production of, ideal sculpture for the household and museums, promote the decoration of public and other buildings, squares, and parks, with sculpture of a high class; improve the quality of the sculptor's art as applied to industries, and provide from time to time for exhibitions of sculpture and objects of industrial art in which sculpture enters."

Its most important work has been under the latter headings, the income of the Society having been chiefly expended in arranging exhibitions of sculpture in New York. Of these it has held three: one, in 1894 in conjunction with the Architectural League of New York, and two independent exhibitions, one in 1895 and the other which has just closed. Both the latter were planned on a truly sumptuous scale, with a rich setting of architecture and plants, and both, it need hardly be added, were the occasion of a great expense to the Society, which, however, has felt amply compensated by the educational work accomplished by them, as well as by the very important influence they have had on the art of sculpture in America.

In addition to its exhibitions the Society has accomplished much useful work in an advisory capacity, both in conducting competitions for works of sculpture and, more especially, in acting as the official adviser of the Park Board of New York, with which body is lodged the care of all the public statues and monuments in that city. No service could have been more useful than this, since in the absence of the professional advice and opinion this Society afforded,

New York has been decorated with a series of monuments that include some of the most grotesque public effigies in existence. It is an interesting fact that while acting in this capacity it was the lot of the Society to prevent, by its unfavourable action, some further disfigurement of the American metropolis. This duty is no longer laid upon the Society, since the charter of the Greater New York, which went into effect on January 1, provides for a Municipal Art Commission which, in the future, will be responsible for New York's monuments.

To those accustomed to the small display of sculpture at the Academy exhibitions, the remarkable display in New York must excite no little interest. It was held in the building of the American Fine Arts Society, a structure erected exclusively for several of the art societies in New York, and in which the National Sculpture Society, with several others, has its permanent home. The exhibition galleries consist of a large entrance gallery, three small rooms, and a large inner room, known as the Vanderbilt Gallery, the cost of which was met by Mr. George Vanderbilt, from whom it takes its name. These galleries are regularly used each year for a series of important exhibitions by the several societies among whom the art world of New York is divided; but it is safe to say that the exhibition of the National Sculpture Society far surpassed any of them in the splendour of its arrangement and in the elaborate means taken to display the works of art exhibited.

The opening gallery was treated as an entrance hall for sculpture in the dwelling of a man of wealth. There was little attempt at decoration here, the works shown being placed on pedestals arranged with care and taste, but without the scenic effects that were so successfully employed in the inner rooms. Had nothing else been shown the contents of this gallery would have borne testimony to the great activity of American sculptors, as well as have afforded impressive testimony of their artistic comprehension and ability. Large individual portrait statues, ideal statues and statuettes, busts, groups, and reliefs made a display at once interesting and extensive.

Just beyond this room the visitor entered a small apartment which had been transformed into a conservatory by means of a trellis decorated with vines and plants, with a charming little fountain, with running water, in the centre. This formed the single piece of sculpture in the room, and its effect was greatly heightened by the setting in which it was placed. From either side one entered similar small rooms, one of which was arranged as a collector's gallery, and the other as a memorial room. In the former, whose walls were decorated with tapestries, were gathered an interesting collection of small objects; a case of Japanese ivory carvings, an extensive series of reproductions of coins from the British Museum, reproductions of old Roman silver and bronzes from Pompeii, together with a number of original works, busts, sculptured andirons and other objects.

The Memorial Room contained several fine tombs, including works already completed and a number of sketch models of others. Here, also, was placed a fine group of bronze reproductions by the late O. L. Warner, one of the most serious and most accomplished of American sculptors, whose

\* Our correspondent appears to have overlooked the largest and finest annual exhibition of sculpture in the world, that of the Paris Salon, which has for years been held in a large open space diversified by shrubs and other adornments.—E.O.



death, a couple of years since, was a great loss to the Society and to sculpture generally. Part of this collection had been made by the Society for presentation to the Metropolitan Museum of Art in New York, as a memorial to its late distinguished member, and part by his wife for the same purpose.

From the conservatory one entered the Vanderbilt Gallery which, for the time being, had been transformed into a garden attached to a city house—a garden enclosed in winter and open in summer. It presented an object less at once unusual and impressive. The walls were hidden with a thick covering of cedar branches, while aisles and walks were made of the same material. In the centre was a colonnade of Ionic columns, and at one end a chateau d'eau, with falling water in the centre and niches on either side. Flowering plants filled the central space, the middle of which was occupied by a small fountain, and effective notes of colour were given by plants in vases, by one or two stuffed peacocks, and other decorations. The general effect was highly decorative and charming, and in itself, apart from the statuary with which it was decorated, would have excited the warmest admiration.

One scarcely felt, as one walked through its green shrubbery, that one was in an exhibition whose sculptured decorations were placed there to be seen of themselves and not as adjuncts to a whole. The place of honour was occupied by the President of the Society, Mr. J. Q. A. Ward, who sent, among other works, the plaster model of a "Student," from his monument to President Garfield, in Washington, and a new reproduction in bronze of his "Indian Hunter," which is one of his most admired works. Directly opposite the spectator as he entered the gallery, was a group by Mr. Daniel C. French, of Erin, flanked by "Poetry" and "Patriotism," for a monument to the late John Boyle O'Reilly in Boston. This impressive group of three figures is considered one of the most imaginative and interesting compositions by this artist, who, like President Ward, has a deservedly great reputation in America, and who will shortly be known in Europe from his equestrian statue of George Washington, which the ladies of America have commissioned him to prepare for presentation to the city of Paris.

Under the colonnade were placed the original plaster models of several of the bronze statues now in the reading room of the Library of Congress, being statues of men of all time distinguished in the arts and sciences. These included "Herodotus" by Mr. French, "Solon" by Mr. F. W. Ruckstuhl, "Bacon" by Mr. J. J. Boyle, "Kent"—a distinguished American jurist—by Mr. G. E. Bissell, "Columbus" by Mr. P. W. Bartlett, and "Professor Henry" by Mr. Herbert Adams. Two colossal bronze statues by Mr. J. Massey Rhind, of Henry Hudson and Peter Stuyvesant, recently completed for one of the new large office buildings in New York, were interesting indications of an increased appreciation of sculpture as applied to buildings. Several coloured busts by Mr. Herbert Adams, which were placed in the garden, attracted considerable attention by reason of their novelty and their own individual merits.

It is anticipated that American sculpture will be considerably represented at the Paris Exhibition of 1900, for in sculpture, as in architecture and in painting, America still looks to Paris for its inspiration and its

instruction. In that event, it may be hoped that a good many English people may take the opportunity of becoming better acquainted with the works of American sculptors.

#### NOTES.

**The Westminster Building Accident.** WE give in our legal column the summing up of Mr. Justice Grantham in the case of the *Crown v. Mr. Pawley*, the architect of the building by the fall of which seven men were killed recently at Westminster; a summing up which resulted in an order to the jury to find the prisoner not guilty. Mr. Pawley has been fortunate in coming before a Judge who, on whatever line of reasoning, has taken a view of the evidence which exonerates him from legal responsibility. But in the minds of those who understand the bearing of all the facts that came out in evidence, the legal verdict will make no difference as to their estimate of the architect's moral responsibility. That a building should be carried up, under the direction of any one who professes to be an architect, in the manner in which Abbey Mansions was shown to have been carried up, is a public scandal, and to accept this as a legitimate or proper carrying out of an architect's duties on a building would be to cast a slur on the whole architectural profession.

**The Institute Scale of Charges.** THE revised scale of architects' charges, finally passed at the meeting of the Institute of Architects on Monday evening, will be found printed in full on another page. The alterations made from the previously existing scale of charges are considerable in regard to form and arrangement; these alterations have been made mainly in order to group the subjects better, and to place under one heading points which refer to the same class of question, and which were formerly illogically separated in some cases. Otherwise, the differences between the new and old scales are not important or sweeping; only the new scale provides for the settlement of some questions likely to arise between architect and client which were not provided for before, and is in this respect a distinct improvement on the old one.

**New Streets in London.** THE case of *Woodham v. The London County Council*, which was recently reported in our columns, is one which is of general importance. According to Section 9 of the London Building Act, 1894 (Sub-Section 4), "where any street is proposed to be laid out in such manner that it will not . . . afford direct communication between two streets when it is intended to form or lay out such street for carriage traffic," the County Council may refuse to sanction the formation of such street. It appeared that they did refuse their sanction to a certain proposed street on the above ground, and the Tribunal of Appeal upheld this decision. The Queen's Bench Division refused to interfere with these findings, on the ground that it was a pure question of fact, and that they could not interfere "so long as such finding is not one at which the Tribunal ought not in law to have arrived." This decision appears practically to make the judgment of the Tribunal of Appeal formed under the London Building Act final in similar cases, and in all others where they have only to decide a

pure question of fact. It is very desirable that there should not be appeals and legal proceedings in this class of dispute, but, at the same time, it is desirable that both the London County Council and the Tribunal of Appeal should exercise their jurisdiction with great tact.

**The Bradfield Play.** ON Saturday last, the day for which our seats had been chosen for the Bradfield College performance of "Antigone," the aspect of the auditorium reminded one of the old line in a tribute to Mrs. Siddons, who it was said, in one of her tragic parts, made old Drury Lane—

"A slope of wet faces from ceiling to floor," with the difference that at the Bradfield theatre the slope was of wet umbrellas, except for a short interlude of sunshine in the middle of the piece. It showed considerable pluck to start the play under such circumstances, but the event justified it, for though people were heard muttering "What insanity!" &c., &c., as they sat in the pouring rain and tried to see under and between the umbrellas before them, they mostly kept their places to the end, a striking proof of the real interest which these revivals of Greek drama have excited. The chorus had to go through two of their principal recitations on the steps of the proscenium, instead of in the orchestra; but otherwise the performance itself was not marred, and was worth the discomfort of the wet day. The whole was very well done; the parts of Creon, by Mr. Vince, and Antigone, by Mrs. Gray, were especially carefully acted, and from all the actors the enunciation of the Greek verse was clear and distinct throughout. It may be of set purpose that the acting is kept in so subdued and conventional a key, for many passages in the play suggest, and would well bear, a far more impassioned style of acting; but possibly this would be regarded as "not Greek," which we should also say of one of Antigone's dresses (the dark one), though the dresses in general were, in the dictionary phrase, "quite class : " \* and very effective. Mr. Abdy Williams's lyres look admirable, but one has to "make-believe a good deal" to enjoy the quasi-Greek music, and in the chorus in praise of Eros one thought sadly of Mendelssohn's modern setting. Now that the Bradfield play has become of so much acceptance, might not an effort be made to build a permanent *σκηνη* such as might actually have faced an ancient Greek audience, in place of the "carpenter's Greek" of the existing one? It would be a very interesting architectural study, at all events.

**Bronze Charioteer of Delphi.** THE now famous bronze charioteer is, from the point of view of art, incontestably the most important of the monuments discovered at Delphi. It is fully illustrated in two beautiful phototype plates in "Monuments et Memoires, Fondation Eugène Piot," vol. 4 (1898), fasc. 2, p. 169, plates XV. and XVI. The previous publications in the "Compte rendu de l'Académie des Inscriptions" (1896), p. 178, and the "Revue de l'Art Ancien et Moderne" (1897), p. 289, gave only a side view; plate XVI. of the "Monuments" gives us a full-face reproduction. The plates are accompanied by a detailed mono-

\* Abbreviation for "quite classical;" "are-assuring comment on a possibly doubtful word."



graph from M. Homolle, dealing mainly with two of the many disputed points about the statue, *i.e.*, its probable restoration and the school to which it is to be ascribed. M. Homolle holds that the "Charioteer" belonged to a group of four persons and a chariot. Two of the persons were standing in the chariot (a quadriga), *i.e.*, the charioteer and the owner of the quadriga, the other two were grooms, and stood at the head of the horses. As to the date and style, M. Homolle attributes this masterpiece to the transitional Archaic period immediately preceding Pheidias, and would associate it with the tendencies known to us under the name of Kalamis.

HITHERTO the practice of photography has been dependent upon the action of light; the photographs being produced by the chemical action of certain rays of light—actinic rays—upon a "sensitive" substance. Now, however, it has been shown by Dr. W. J. Russell that certain metals and other substances will act upon a photographic plate even though the exposure takes place in total darkness, and it is reported that since communicating this discovery to the Royal Society he has taken some two thousand photographs entirely without the aid of light. Many cases can be conceived in which ability to take photographs in the absence of light may be of great service, and the scientific world will wait with some impatience for Dr. Russell's next paper on the subject, which he hopes to communicate to the Royal Society at an early date. The length of time required for exposure in this new method of photography is certainly a drawback, but further research will doubtless reveal some method by which it may be shortened. What glorious possibilities loom ahead for the photographer: photography in total darkness—photography through opaque bodies—photography at the ocean bottom; to what further discoveries may not these lead, and what fields of absorbing interest already lie open to the experimental photographer!

WE notice that the Chief Officer of the London Fire Brigade has at last adopted the Continental system of dividing the calls for fire into three distinct classes:—(1) Home calls, (2) District calls, (3) Brigade calls. The first are for what we might term a minor fire, the second a medium fire, and the third a large fire. Up to the present time, as we have had frequent occasion to point out, the attendance at a fire after a first call, which was responded to by the nearest engines, was scarcely a matter of system, it being left to the discretion of a subordinate officer at headquarters to turn out what further engines he considered necessary, according to the nature of the message he received. The three terms to be employed will briefly signify the amount of assistance required, and whence it is to be derived. The Chief Officer is also arranging a kind of central district, which will serve as a first main reserve in the case of severe outbreaks, and will fulfil the same office as the central district at Berlin, or the headquarters district at Vienna. The note issued with these new orders states that "it is better to have an ample attendance of firemen rather than to run the risk of a fire breaking away." This is again a step in the

right direction, and one which has been successfully acted upon of late at different fires, notably a few weeks back at Tooley-street. It used to be against the *amour propre* of a station to call for assistance if there was the slightest chance of the first engines present being able to deal with the outbreak, and similarly district officers were never enthusiastic as to help from outside their own section. In fact, the lack of a strong turn-out in the early stages of a fire was one of the worst anomalies in our fire brigade system. It should be of considerable value to the Metropolis that some of the various criticisms which have appeared of late have at last had their effect.

THE interior arrangements of the Carnavalet Museum have been completely transformed by the new Curator, M. Georges Cain, who has given proof both of his good taste and his faculty for methodical administration. The Municipal Library is now relegated to the adjoining Hôtel de Pelletier de Saint Fargeau, and the principal suite of rooms in the Hôtel Carnavalet, formerly occupied by Mme. de Sévigné, and which were on a former occasion fully described in our pages, has been repaired and fitted with woodwork of the seventeenth and eighteenth centuries, taken from old Paris mansions no longer in existence. M. Cain has thus formed a picturesque setting in which the history of old Paris can be studied in portraits, drawings, engravings, sculptures, numerous pieces of rare ceramic work, furniture, jewellery, costumes, &c., classed in chronological order. The museum, which is much superior to the Cluny Museum in classification and arrangement, now includes three distinct departments: the first dedicated to the topography of Paris, with all the remains that have been discovered of the Gallo-Roman and Merovingian periods; the second, the historic galleries, to portraits, uniforms, arms, insignia, and views of quarters of Paris which have been altered and rebuilt; the third to a collection of furniture and other objects illustrating the styles of work anterior to the Revolution. Under this last category may be mentioned especially a small room made up with woodwork of *rococo* type, painted with Chinese subjects on a gold ground, and with panels of lacquered subjects on glass. This piece of old decoration came from the Hôtel de Lariboisière, and gives a good idea of the boudoirs of the last century.

Decoration of  
New Mairie,  
Vincennes.

THE first competition for the decoration of the Salle des Fêtes of the New Mairie at Vincennes has resulted in the reception of a large number of sketches, some of them of considerable interest. By the terms of the competition the artists were to base their compositions on views taken in the neighbourhood of Vincennes, one of the most picturesque among the environs of Paris. Among the designs may be specially mentioned the panoramic view of the valley of the Marne and the views in the Bois de Vincennes, by M. Bourgeois, the author of the views in Brittany and Normandy which decorate the large hall of the St. Lazare railway station. Some admirable works were also submitted by MM. Darien, Poittevin, Albert Girard, F. Lamy, Foreau,

and Vauthier; the latter artist having made a special feature of the representation of the environs of Paris generally. The jury, among whom are included MM. Puvion de Chavannes, Harpignies, and Cazin, are to select from among the competitors three artists to execute complete works on a large scale for the final competition.

No. 7, Fleet-  
street.

ANOTHER notable house in Fleet-street is, we understand, likely to be demolished. It is No. 7, occupied by Messrs. Butterworth & Co., the well-known publishers of law books. It stands on the site of premises where, at the sign of the "Hand and Star," Richard Tottel traded as printer, under exclusive patents, of books of the Common Law during the reigns of Edward VI. and his two successors on the throne. His printing-office was at the back, and afterwards formed part of "Dick's" Coffee House. John Jaggard, *templ.* James I., and Joel Stephens, *templ.* George I., carried on the business (under the original sign), which has thus passed to its present owners; and the landlords, we believe, possess a set of deeds relating to the property, beginning from as early as the middle of the sixteenth century.

A German Model  
Competition.

GODESBERG, on the Rhine, has lately offered promising materials for the study of the pathology of competitions. Beside the town is a hill from which it takes its name, crowned with the picturesque ruins of a castle familiar to all lovers of the Rhine. In the *Centralblatt der Bauverwaltung* for April 27 there appeared the ominous announcement that the authorities at Godesberg were desirous of putting the hill and castle into proper order; this probably means that the drinking-saloon which, if our memory serves us aright, is already there will be considerably enlarged and will develop a skittle-alley. An open competition was, therefore, offered for the laying out of the grounds and supplying proper approaches. Three premiums were offered, their values being 5*l.*, 3*l.* 15*s.*, and 2*l.* 10*s.* respectively. (Apparently this was not meant as a joke.) In the issue of the same periodical for May 28 appeared a letter from a would-be competitor. He had applied for the conditions, and found them so meagre as to be unintelligible. There were but seven short paragraphs: the first occupied with the number of members of the board of adjudicators; a second warned competitors to send in designs "having regard to the position and peculiarities of the ruins, to the new 'Wiederherstellungsbau,' and to the mediæval character of the work;" while a third informed him that "all plans are to become the absolute property of the town." He wrote and asked what the "Wiederherstellungsbau" was—about which no information was given; whether the unsuccessful designs were to become town property; and who composed the board of adjudicators (a piece of information which is generally published in foreign competitions). The letter was returned unstamped, and thus endorsed:—

"Come and find out anything else on the spot. To your last questions I can return no answer off-hand."

The recipient of this courteous communication is naturally indignant, and very justly is inclined to fear that mischief is brewing



for the ruins. It is perhaps comforting to find that England is not alone in vulgarising ancient monuments and is promoting unsatisfactory competitions.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—IV.

FOLLOWING in order from the works mentioned in our last notice (page 584 *ante*) we come on the view of a "House at Wokingham" (1637) by Mr. Ernest Newton. This being a water-colour drawing, whereas Mr. Newton's works have usually been represented at the Academy by line drawings, gives at first sight a different impression from that which one usually associates with Mr. Newton's work, reminding one how much of the impression of an architectural design as seen only in a drawing is influenced by the style of the drawing; another argument against this continual employment of perspective drawings for the illustration of architecture at the Royal Academy. Geometrical drawings and plans give us the real facts and working out of an architectural design, independently of the idiosyncrasies of the draughtsman. In reality, the house shows all Mr. Newton's usual characteristics in domestic architecture, except perhaps the appearance of a decorative metal railing round the balcony formed by the porch roof. Mr. Halsey Ricardo exhibits a view of a long low house (1640) near Bramley, with rather small mullioned windows, a little too much like a reproduction of an old late Gothic country house; a plan is added, showing that the question of aspect of rooms has been adequately considered. Mr. Horsley's elevation and plans for "A Country House" (1656) form another example of the extremely simple treatment of a house with mullioned windows, though in a rather more formal and symmetrical style than Mr. Ricardo's; a plan is also given, but a plan of rather naive character, and no compass is shown, but we gather from the placing of the rooms that the entrance front must be intended to be northward. Mr. Christopher Carter's "Proposed Memorial, Horn-castle, Lincoln" (1568) seems to be a kind of revival of the old form of central market shed to be found, for instance, at Dunster; it is an octagonal timber shed with a high-pitched roof and a stone pier in the centre which terminates in a short turret above the roof; the structure combines very well the qualities of picturesque and utility.

Mr. Howard Ince's "House at Fleet" (1673) shows a sense of the element of style in the treatment of very simple details, and is accompanied by a small plan, but with no names to the rooms and no compass, so that the plan is not of very much use. Mr. F. W. Bedford, on the other hand, gives complete working plans of "Braham, near Perth" (1680), a good house in no very marked style, but no compass is added to the plan. Mr. E. Evans's "Riverside Villa in the Italian Style" (1681) is Italian as to the arrangement and laying out of the gardens, but the house can hardly be called in any special sense Italian. Mr. Jas. A. Morris's "Garden and Proposed addition to Red House, Ayr" (1692) was illustrated in the *Builder* of June 11; it is an effective pen drawing showing a new wing with two symmetrically treated bay-windows, and a garden in front; which, however, we believe is not being carried out as shown here. The "spike" terminals over the bays are not to our taste. Mr. Iberson's "Two Houses, Hunstanton, Norfolk" (1690) have a certain character from the combination of the brown stone, yellow rough-cast, and white wood-work, shown in a rather slight drawing. Mr. Taylor's "An Hotel in the Isle of Wight" (1693; why do people write "An hotel"? it is not correct is an example of a hotel treated in a simple and unpretending manner, with a columned loggia in front which has a pleasant effect. Mr. C. J. H. Cooper's "Exterior of Palace Gate House, Kensington," is a simple front with mullioned windows but with a certain degree of distinctive character arising from the treatment of small details; the front is bounded by an octagonal shaft at each angle, capped with the gable moulding, which runs horizontally into it after taking a dip at the foot of the gable.

Mr. Leonard Stokes's "Shooter's Hill House, Pangbourne" (1718, 1724) introduces a rather new element in architectural illustration in the shape of two sketches in coloured crayons,

which are effective in a general way, as drawings, but do not indicate detail very clearly. The exterior seems to have a tremendously projecting cornice. The interior drawing, showing the picture gallery, has a good effect in a general way—it is a free well-handled sketch, but does not present anything out of the way in style or detail. Mr. Sidney Smith's perspective view of "New Residence, Green-street, Park-lane" (1726) shows a solid block of red brick with stone dressings, with a very strongly marked cornice; a sensible and solid-looking London house which hardly pretends to any originality. A very small plan is appended to it. Mr. C. E. Vaughan's "Design for addition to Town Hall buildings, Clerkenwell" (1733), is a public building design which we accidentally passed over before, and a rather striking one; it is a water-colour drawing showing the rounded end of a stone building at the meeting of two streets, with an order of columns, and a picturesquely treated cupola above; beneath the first floor string is a sculptured frieze; the basement is treated with plain, semi-circular rusticated windows; as a specimen of district municipal architecture this is effective and suitable. A "Front for a Town House, in Ham Hill stone and bronze" (1740), by Mr. H. V. C. Smith, shows a suggestion for street architecture of an unusual and original type; the large leaded windows, and something in the general appearance of the front, partly remind one of the old London houses of the Peter Paul Pindar type, but the coloured work in the under side of the projecting window, and the figures leaning forward under the cornice (we presume these are parts of the bronze work) give it a different character. The whole design is original and effective, but one would hardly expect to see it carried out.

Mr. Walter Cave's "Bank, Bedminster" (1741), is a coloured elevation of some originality; the ground story, containing of course the bank, is of stone, with large circular headed windows; above the first floor are a series of vertical bands of stonework slightly projecting from a brick ground, and in which the windows are framed; the whole finishes with an abnormally large moulding instead of a cornice of ordinary scale of parts. This method of using well-known mouldings out of all proportion to their normal scale is one of the sources of originality of the day, but not we think one of the best. Mr. A. C. Blomfield's "Rebuilding Gosling's Bank" (1751) is a powerful pen-and-ink drawing of a bold and effective street front, having sufficiently the appearance of a bank. The two ends of the front are up to the street line, with doorways framed in large arched niches and crowned with broken pediments; the recessed central portion is decorated with columns running through the first and second stories. As a whole this is one of the most satisfactory exhibits in the room.

Mr. Voysey's "House at Limpsfield" (1758) is another of the combinations in white plaster and green slate of which he has shown some other examples in the R.A. room; an effect attractive as long as it is novel, though we are inclined to think it is more effective on paper than in the reality. The same architect's "House at Thorpe, Mandeville" (1759) shows a variation in the shape of white plaster and red tiles. The introduction of white surface on the exterior of buildings is becoming rather a favourite source of effect now, and a perfectly legitimate one, if it does not degenerate into a fashion.

Mr. Aston Webb's "Yacht Club, Village Shops, &c., for Yarmouth, Isle of Wight" (1762) is a view showing a small club facing towards the water, and a row of shops in the background, at right angles to the club front, with a loggia on the ground story; there is no plan; the group looks picturesque and will form an important public improvement to the little port. Mr. Harrison Townsend's "Cliff Towers" (1771), a drawing showing only a portion of a house, including the main entrance, seems as if partly suggested by some of the modern American developments of sea-side domestic architecture; it is certainly original enough—nothing more so in the room; and we like it. Mr. Aston Webb's "A Grain Silo, Greenwich" (1774) is a very striking example of the picturesque treatment of a warehouse building; there is something about it like a reminiscence of the Ducal Palace, simplified into warehouse form. Mr. Ravenscroft has made a very successful conversion of an old malthouse at Streatham into a club and

residence (1778); it is surprising how picturesque the long building looks in its transformation to this new purpose. Mr. Horace Field's design for "New General Offices, York," for the North Eastern Railway (1785) is a far better stamp of building, as might be expected, than we generally see in connexion with railway offices; it is a solid-looking brick building with three large gables, those at the end plain, the centre one treated with steps and curves, and supported by two massive buttress-like projections below, ending in consoles falling back to the wall line; a building showing a good deal of power and character in a quiet way. Mr. R. Blomfield's "House at Medmenham" (1786) is a charming little water-colour drawing of a house which looks exactly like an old eighteenth-century house; but, though this kind of reproduction of a past manner of building is not to be achieved in so correct and complete a form without a good deal of study, it is really only a kind of *revenant* in house architecture. Mr. Baillie Scott's "Proposed House at Bexley" (1787), again, would rather suggest the title "Old Farmhouse, Bexley." Mr. Tapper's interior, "Design for Billiard-Room" (1789), shows a room with canted ceiling with floral ornaments in the middle of each space—whether painted or modelled is not quite apparent from the drawing; the whole looks well. Mr. F. W. Troup's "New Residence for Mansfield House University Settlement, Canning Town" (1790) is a very plain brick building with a well-arranged plan on a difficult and irregular site. Next to this Mr. Kitson's "Plymouth Citadel New Recreation and Soldiers' Block" (1791) is an interesting exhibit; a small pencil drawing showing the two sides of a row of quiet-looking cottages, a plan of one of which is given. The back elevation is supported, as it were, by two old bastions or round towers, which seem to confine it at each end. The building is simply treated, with a little more detail in the central block, of which a drawing on a larger scale is given.

In our next and concluding article we will notice the decorative and illustrative drawings. Of several of the designs mentioned in the course of the present article we have lithographs, which will be given shortly.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### THE PROFESSIONAL PRACTICE AS TO THE CHARGES OF ARCHITECTS.

A SPECIAL general meeting of this Institute was held on Monday at No. 9, Conduit-street, Mr. E. A. Gruning, Vice-President, in the chair.

The minutes of last meeting having been taken as read, the consideration was resumed of the revised schedule of charges, adjourned from the meeting of June 6.

The following is the schedule as amended and adopted:—

"The Professional Practice as to the Charges of Architects: Schedule Sanctioned by the Royal Institute of British Architects, Confirmed at a General Conference of Architects of the United Kingdom, 1872, and Revised by the Royal Institute, 1898.

1. The usual remuneration for an architect's services, except as hereinafter mentioned, is a commission of 5 per cent. on the total cost of works executed under his directions. Such total cost is to be valued as though executed by a builder with new materials. This commission is for the necessary preliminary conferences and sketches, approximate estimate when required (such, for instance, as may be obtained by cubing out the contents), the necessary general and detailed drawings and specifications, one set of tracings, duplicate specification, general superintendence of works, and examining and passing the accounts, exclusive of measuring and making out extras and omissions.

2. This commission does not include the payment for services rendered in connexion with negotiations relating to the site or premises, or in supplying drawings to ground or other landlords, or in surveying the site or premises and taking levels, making surveys and plans of buildings to be altered, making arrangements in respect of party-walls and rights of light, or for drawings for and correspondence with local and other authorities, or for services consequent on the failure of builders to carry out the works, or for services in connexion with litigation or arbitration, or in the measurement and valuation



of extras and omissions. For such services additional charges proportionate to the trouble involved and time spent are made. The clerk of the works should be appointed by the architect, his salary being paid by the client.

3. In all works of less cost than 1,000*l.*, and in works requiring designs for furniture and fittings of buildings, or for their decoration with painting, mosaics, sculpture, stained glass, or other like works, and in cases of alterations and additions to buildings, 5 per cent. is not remunerative, and the architect's charge is regulated by special circumstances and conditions.

4. When several distinct buildings, being repetitions of one design, are erected at the same time from a single specification and one set of drawings and under one contract, the usual commission is charged on the cost of one such building, and a modified arrangement made in respect of the others; but this arrangement does not apply to the reduplication of parts in one building undertaking, in which case the full commission is charged on the total cost.

5. If the architect should have drawn out the approved design, with plans, elevations, sections, and specification, the charge is 2½ per cent. upon the estimated cost. If he should have procured tenders in accordance with the instruction of his employer, the charge is ½ per cent. in addition. Two and a half per cent. is charged upon any works originally included in the contract or tender, but subsequently omitted in execution. These charges are exclusive of the charge for taking out quantities. Preliminary sketches and interviews, where the drawings are not further proceeded with, are charged for according to the trouble involved and time expended.

6. Should the client, having approved the design and after the contract drawings have been prepared, require material alterations to be made, whether before or after the contract has been entered into, an extra charge is made in proportion to the time occupied in such alterations.

7. The architect is entitled during the progress of the works to payment by instalments on account at the rate of 5 per cent. on the amount of the certificates when granted, or alternatively, on the signing of the contract, to half the commission on the amount thereof, and the remainder by instalments during their progress.

8. The charge per day depends upon an architect's professional position, the minimum charge being three guineas.

9. The charge for taking a plan of an estate, laying it out, and arranging for building upon it, is regulated by the time, skill, and trouble involved.

10. For setting out an estate the position of the proposed road or roads, taking levels, and preparing drawings for roads and sewers, applying for the sanction of local authorities, and supplying all necessary tracings for this purpose, the charge is 2 per cent. on the estimated cost. For subsequently preparing working drawings and specifications of roads and sewers, obtaining tenders, supplying one copy of drawings and specification to the contractor, superintending works, examining and passing accounts (exclusive of measuring and valuing extras and omissions), the charge is 4 per cent. on the cost of the works executed, in addition to the 2 per cent. previously mentioned.

11. For letting the several plots in ordinary cases the charge is a sum not exceeding a whole year's ground-rent, but in respect of plots of great value a special arrangement must be made.

12. For approving plans submitted by the lessee, and for inspecting the buildings during their progress, so far as may be necessary to ensure the conditions being fulfilled, and certifying for lease, the charge is a percentage not exceeding 1½ per cent. up to 5,000*l.*, and above that by special arrangement.

13. For valuing freehold, copyhold, or leasehold property the charge is:—

On 1,000*l.* ..... 1 per cent.  
Thence to 10,000*l.* ..... ½  
Above 10,000*l.* ..... ¼ " on residue.

In valuations for mortgage, if an advance is not made, one-third of the above scale. The minimum fee is three guineas.

14. For valuing and negotiating the settlement of claims under the Lands Clauses Con-

solidation Act or other Acts for the compulsory acquisition of property, the charge is on Ryde's scale as follows:—

On Amount of Settlement, whether by Verdict, Award, or otherwise.

Amount	Gs.	Amount	Gs.	Amount	Gs.
100	5	2,000	25	5,000	39
200	7	4,000	25	5,400	41
300	9	6,000	25	5,800	43
400	11	8,000	25	6,200	45
500	13	10,000	28	6,600	47
600	15	12,000	30	7,000	49
700	17	14,000	30	7,400	51
800	19	16,000	31	7,800	53
900	21	18,000	32	8,200	55
1,000	23	20,000	34	8,600	57
1,200	25	22,000	35	9,000	59
1,400	27	24,000	36	9,400	61
1,600	29	26,000	37	9,800	63
1,800	31	28,000	38	10,200	65
2,000	33	30,000	39	10,600	67
				11,000	69
				11,400	71
				11,800	73
				12,200	75
				12,600	77
				13,000	79
				13,400	81
				13,800	83
				14,200	85
				14,600	87
				15,000	89
				15,400	91
				15,800	93
				16,200	95
				16,600	97
				17,000	99
				17,400	101
				17,800	103
				18,200	105
				18,600	107
				19,000	109
				19,400	111
				19,800	113
				20,200	115
				20,600	117
				21,000	119
				21,400	121
				21,800	123
				22,200	125
				22,600	127
				23,000	129
				23,400	131
				23,800	133
				24,200	135
				24,600	137
				25,000	139
				25,400	141
				25,800	143
				26,200	145
				26,600	147
				27,000	149
				27,400	151
				27,800	153
				28,200	155
				28,600	157
				29,000	159
				29,400	161
				29,800	163
				30,200	165
				30,600	167
				31,000	169
				31,400	171
				31,800	173
				32,200	175
				32,600	177
				33,000	179
				33,400	181
				33,800	183
				34,200	185
				34,600	187
				35,000	189
				35,400	191
				35,800	193
				36,200	195
				36,600	197
				37,000	199
				37,400	201
				37,800	203
				38,200	205
				38,600	207
				39,000	209
				39,400	211
				39,800	213
				40,200	215
				40,600	217
				41,000	219
				41,400	221
				41,800	223
				42,200	225
				42,600	227
				43,000	229
				43,400	231
				43,800	233
				44,200	235
				44,600	237
				45,000	239
				45,400	241
				45,800	243
				46,200	245
				46,600	247
				47,000	249
				47,400	251
				47,800	253
				48,200	255
				48,600	257
				49,000	259
				49,400	261
				49,800	263
				50,200	265
				50,600	267
				51,000	269
				51,400	271
				51,800	273
				52,200	275
				52,600	277
				53,000	279
				53,400	281
				53,800	283
				54,200	285
				54,600	287
				55,000	289
				55,400	291
				55,800	293
				56,200	295
				56,600	297
				57,000	299
				57,400	301
				57,800	303
				58,200	305
				58,600	307
				59,000	309
				59,400	311
				59,800	313
				60,200	315
				60,600	317
				61,000	319
				61,400	321
				61,800	323
				62,200	325
				62,600	327
				63,000	329
				63,400	331
				63,800	333
				64,200	335
				64,600	337
				65,000	339
				65,400	341
				65,800	343
				66,200	345
				66,600	347
				67,000	349
				67,400	351
				67,800	353
				68,200	355
				68,600	357
				69,000	359
				69,400	361
				69,800	363
				70,200	365
				70,600	367
				71,000	369
				71,400	371
				71,800	373
				72,200	375
				72,600	377
				73,000	379
				73,400	381
				73,800	383
				74,200	385
				74,600	387
				75,000	389
				75,400	391
				75,800	393
				76,200	395
				76,600	397
				77,000	399
				77,400	401
				77,800	403
				78,200	405
				78,600	407
				79,000	409
				79,400	411
				79,800	413
				80,200	415
				80,600	417
				81,000	419
				81,400	421
				81,800	423
				82,200	425
				82,600	427
				83,000	429
				83,400	431
				83,800	433
				84,200	435
				84,600	437
				85,000	439
				85,400	441
				85,800	443
				86,200	445
				86,600	447
				87,000	449
				87,400	451
				87,800	453
				88,200	455
				88,600	457
				89,000	459
				89,400	461
				89,800	463
				90,200	465
				90,600	467
				91,000	469
				91,400	471
				91,800	473
				92,200	475
				92,600	477
				93,000	479
				93,400	481
				93,800	483
				94,200	485
				94,600	487
				95,000	489
				95,400	491
				95,800	493
				96,200	495
				96,600	497
				97,000	499
				97,400	501
				97,800	503
				98,200	505
				98,600	507
				99,000	509
				99,400	511
				99,800	513
				100,200	515
				100,600	517
				101,000	519
				101,400	521
				101,800	523
				102,200	525
				102,600	527
				103,000	529
				103,400	531
				103,800	533
				104,200	535
				104,600	537
				105,000	539
				105,400	541
				105,800	543
				106,200	545



Roux, of Paris, read a resumé of about a dozen communications received from architects or from schools of art in different parts of France, on the subject of Art-Industries, and among others who took part in the discussion M. Lucas, of Paris, recommended that the architect should have a larger share in the education of the pupils of the schools of Decorative Art; but no vote was taken on the subject, which it was arranged should be brought up again at the next meeting.

The afternoon was again devoted to drives of inspection, this time in the north-west quarter of Paris, where the party visited the restorations of the Galerie Dorée (now the Bank of France) carried out about fifteen years ago by M. Questet; the new Opera Comique; the façade of the Firemen's Barracks in Rue Jean-Jacques-Rousseau, a striking and vigorous design by M. Peronne; and the exterior and interior of various apartment houses designed by MM. Breffendille, Lucien Magne, Lacan, Levoisvenel, Wallon, Benoitville & Plumet, Girault, Mewes, and Vaudremer.

On the 23rd a visit was paid to the new buildings for the Government Exhibition and to the Pont Alexandre III., under the guidance of the architects, MM. Bouvard, Girault, Deglane, Louvet, Thomas, and others—and the engineers, MM. Résal and Alby. What interested the visitors most, in the exploration of the buildings in course of construction, was the model-room in the old Palais de l'Industrie, where models and details of the two new art palaces and the new bridge, of beautiful workmanship, have been set up at no little cost. In the afternoon of the same day the ordinary sitting was resumed at the Ecole des Beaux Arts, when M. Lucien Magne read a paper on Art-Industry in terra-cotta and glass, illustrated by a number of drawings of various types of work in the potters' and glass-makers' art.

The largest attendance of members (more than two hundred) was on Thursday the 23rd, a day entirely devoted to an excursion to Melun, the antiquities of which were explained and commented on by various architects of the Society of the Department of Seine-et-Marne; and an excursion to the chateau of Vaux-le-Vicomte, the joint work of Leveau, Lebrun, & Le Nôtre, and filled with fine works of modern art. The visitors were most hospitably entertained here by the present proprietors, M. and Mme. Sommer.

Friday morning, the 24th, was the general meeting of the "Caisse de Défense mutuelle," under the presidency of M. Lenoir, of Nantes, when the secretary, M. Lucas, read his report, which gave a very satisfactory account of the development of this useful institution, now in the fourteenth year of its existence.

On Friday afternoon M. Guadet read a very able and well-written memoir on the life and work of the late M. Gninain, and M. Gustave Larroumet delighted his audience with a lecture on the Byzantine architecture of Guienne and Languedoc, especially dealing with the churches of St. Front, Périgueux, and Saint Etienne, Cahors.

On Saturday morning, under the presidency of M. Beignot, of Angers, a resolution was passed, at the instance of the Caisse de Défense, tending towards a reform in an important point of legal procedure relative to the judgments rendered by the Conseils de Préfecture, and the appeals from them to the Conseils d'Etat; and subsequently M. Frantz Blondel, of Versailles, President of the "Société d'Assistance Confraternelle," recapitulated the origin, ends, and advantages of this already flourishing professional institution. After a vote of thanks, moved by M. Lucius Etienne, vice-president of the Société Centrale, to the provincial members who had attended the Congress in larger numbers than on any previous occasion, and to all those who had taken part in organising the Congress and the visits, the sitting was declared closed.

Saturday afternoon was, as usual, devoted to the distribution of the "Recompenses" awarded by the Société Centrale. One award was to the oldest member of the profession, M. Simon Girard, who at the age of ninety-four is still actively at work. Other awards were to the pupils of the Schools of Architecture and Construction, to the Art Industrial workers, and to the *personnel du bâtiment*—altogether more than forty prize-winners, six of whom, the most meritorious among the building artisans, received from the representative of the Government the special medal of the Ministry of Commerce and Industry, in recognition of their services.

In the evening the usual dinner took place at the Hôtel Continental, at which there was read a congratulatory telegram just received from the Comte de Suzor, President of the Société Imperiale des Architectes Russes. Various toasts were proposed—by M. Henry Havard, Inspecteur-Général des Beaux Arts; M. de Selves, Prefect of the Seine; M. Alfred Picard, Commissioner-General of the 1900 Exhibition; M. Bouvard, Director of Works of the Municipality of Paris and of the 1900 Exhibition; by MM. Etienne and Duchâtelet, Vice-Presidents of the Société Centrale; by M. Boileau, Principal Secretary of the same society; M. Geo. Perrot, Director of the Ecole Normale Supérieure; by M. Charles Garnier, whom all were glad to welcome once more among them; and finally by the venerable M. Simon Girard. As a wind-up to the festivity, a "chanson de circonstance" was improvised by M. Brincourt, which was a decided success, and the company separated about midnight.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday at the County Hall, Spring-gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Islington Vestry 6,470*l.* for laying out an open space adjoining the cattle market; the Kensington Vestry, 15,500*l.* for Vestry offices; the Lambeth Vestry, 5,985*l.* for paving works; the Vestry of St. George the Martyr, Southwark, 4,025*l.* for pipe sewers; the Shoreditch Vestry, 4,585*l.* for street improvements; and the Managers of the Kensington and Chelsea School District, 2,000*l.* for works at Banstead school.

**The Works Department.**—The half-yearly return of works completed by the Works Department up to March 31 was submitted by the Finance Committee. The total of the original estimates of the eleven jobs reported upon was 40,690*l.*; the final estimate was 29,124*l.*; and the actual cost was 24,505*l.*, the total balance of cost below final estimates being 4,610*l.*. The figures in the statement, as to jobbing works include all jobbing works executed in the year 1897-8, so far as the accounts have been approved, and the total amount of cost below schedule value is given as 2,033*l.*

Dr. Collins said he hoped there was now a general desire to "bury the hatchet" on the question of the Works Department. The return certainly justified the opinion that the Council should be in a position to carry out its own work, and that the Department should be continued in the interest of the ratepayers. He characterised the Works Department as a much criticised, much maligned, but still triumphant institution.

Mr. Corbett inquired whether Lord Welby, the Chairman of the Finance Committee, adhered to the statement made by him shortly before the election, that that Committee were not able to exercise direct control over the small details of the business of the Works Department, and that a victory for the Progressives must be followed by the re-establishment of the Works Committee, or by some new device for securing proper control.

Lord Welby said the Finance Committee did not, in the first instance, desire the charge of the Works Department, and could now only exercise a financial control, but they were thoroughly able to satisfy themselves that the accounts were correct. They accepted the duty imposed upon them by the Council as a solemn trust, and would carry it out to the best of their power, but they did not decide what works were to go to the Works Department, nor did they settle the details of such works.

Lord Onslow asked why certain works reported as unfinished on December 31 were not now returned as completed. He believed that there was a heavy loss on them.

Lord Welby said they had not yet been certified by the Council's officers.

Mr. Beachcroft inquired whether there was now enough work in hand to justify the existence of the department.

Sir J. Hutton, chairman of the sub-committee of the Finance Committee dealing with the department, replied that including works not yet reported upon, works in hand, and works not yet commenced, the department had charge of operations totalling 151,000*l.*

Mr. Goulding, M.P., wished to know whether the committee had received any esti-

mate of the probable annual cost to the Council under the Workmen's Compensation Act, and whether it was proposed that the Council should insure itself, and in what way.

Lord Welby replied that no such estimate had been made, and some experience of the working of the Act would be necessary before it could be made. The insurance companies appeared to be unable at present to arrive at any figures on the subject, but the Committee's information, so far, was rather in the direction of the Council insuring itself.

Sir J. Hutton said the benefits to workmen under the Council's present regulations were slightly better than those to which the new Act would entitle them. It would be imprudent at the present time to lay down a hard-and-fast line, and to ignore special circumstances which were now considered.

**New Sources of Revenue.**—The following recommendation of the Local Taxation and Government Committee was adopted:—"That the following proposals be approved and submitted to the Royal Commission on Local Taxation, together with the resolutions already passed by the Council on December 7 and February 1 and 8 last, in substitution for the recommendation referred back—(a) That it is desirable that taxation arising from local sources should be devoted to local purposes, and that the inhabited house duty is one of those taxes, which should be transferred accordingly to the counties. (b) That certain services now administered and paid for locally are so far of national concern that the burden ought to be borne by the nation."

The Council adjourned soon after seven o'clock.

#### ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—The Association held its annual excursion on Saturday, the 18th ult. The object of the visit this year was the small but picturesque Priory of Inchmahome, situated in a wooded island in the Lake of Menteith, Perthshire, amidst beautiful mountain scenery. A party of members and friends took train from Glasgow to Port of Menteith station, where carriages were awaiting to convey the visitors to the lake. On arrival on the island the secretary read a short descriptive sketch of the building, and exhibited a plan. The Priory, which was in the Diocese of Dunblane, was founded in, and evidently commenced about 1238 for monks of the Augustinian order, and is an example of the best first-pointed work; it bears in plan and general detail many points of resemblance to Dunblane Cathedral, which was building at the same time. The building has suffered much at the hand of man since the Reformation, as much of it was taken away during the seventeenth century to build a castle in a neighbouring island. The party departed with reluctance after a most enjoyable day's outing.

#### COMPETITIONS.

FEVER HOSPITAL, CARSHALTON.—Messrs. Treadwell & Martin, of Waterloo-place, have been awarded the first premium (150*l.*) in the competition for a new fever hospital at Carshalton; Messrs. Pennington & Sons the second (100*l.*); and Messrs. Newman & Newman the third (50*l.*).

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

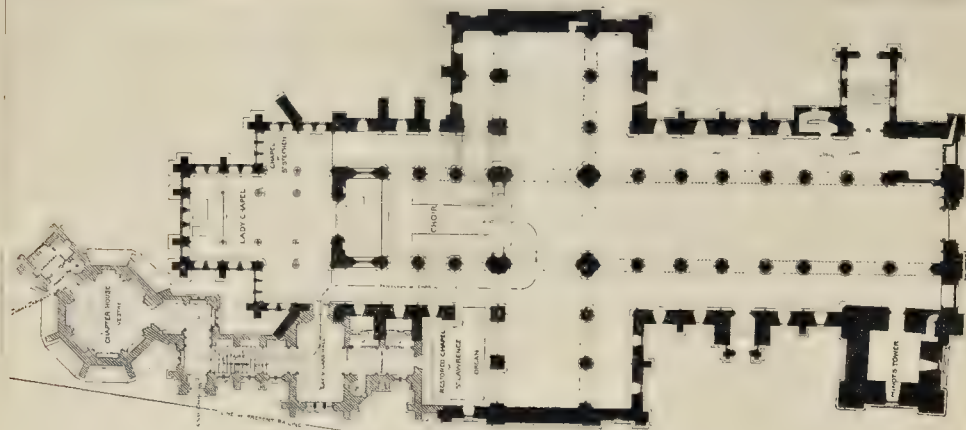
**Hackney, Central.**—Residential flats, with shops, on the east side of Clarence-road, between No. 136 and Holly Lodge-grounds, Lower Clapton (Mr. A. Bedborough for Mr. W. Andrews).—Consent.

**Hackney, Central.**—Two blocks of residential flats, with shops, on the west side of Lower Clapton-road, between Holly Lodge and Maitland House (Mr. A. Bedborough for Mr. W. Andrews).—Refused.

**Marlybone, East.**—A one-story addition on the west side of No. 1, Henstridge-villas, St. John's Wood, to abut upon Ordnance-road (Mr. G. O. Scorer for the St. John's Wood and Portland Town Provident Dispensary).—Refused.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.





*Proposed Additions to St. Patrick's Cathedral, Dublin. Plan.*

*Paddington, South.*†—Two iron and glass shelters erected at the entrances to the Bath and Cheltenham Hotel, Nos. 23 and 24, London-street (Messrs. Treadwell & Martin, for Mr. F. Evans).—Refused.

*Woolwich.*—A open portico and steps at the entrance to the club house on the south side of Glyndon-road, Plumstead (Mr. J. Swift, for the Amalgamated Society of Engineers).—Refused.

**Lewisham.**—A conservatory on the southern flank of a house known as Kilwhang, Mayow-road, Sydenham, to abut upon Adamsrill-road (Mr. G. Tolley, for Mr. G. H. Sollas).—Refused.

Width of way.

## Width of way.

*Greenwich.*—A urinal and lavatory addition at the rear of the Prince Arthur public house, Greenwich-road, to abut upon a road leading to Straightsmouth (Mr. W. H. Fisher, for Messrs. Coombe & Co., Limited, and Mr. E. Anderson).—Consent.

*St. Pancras, East.*—A one-story workshop on land at the rear of No. 14, Rochester-terrace, Camden Town, to abut upon Rochester-place, at less than the prescribed distance from the centre of the road (35. 7-35. 10).

*Southwark, West.*—A building on the north side of Orange-street, at less than the prescribed distance from the centre of the road (Mr. E. Carritt for Mr. I. Sainsbury).—Consent.

*Whitechapel*.—Covering in of a yard at the rear of No. 55, Fashion-street, Spitalfields, to abut upon Harriot-place, and the erection of a two-story water-closet at the rear of No. 56, Fashion-street (Mr. J. Farrer for Messrs. G. Scammell & Nephew).

*Southwark, West.*—Twelve houses on the western side of Webber-row, St. George-the-Martyr (Messrs. F. S. Brereton & Son for the Trustees of Marshall's Charity).—Consent.

*Islington, South.*—A building on the north-east side of Graham-street, City-road (Mr. J. W. Stevens for Messrs. A. Bridgman & Co., Limited).—Refused.

*Line of Fronts and Width of Way.*

*Dulwich*.—Houses on the west side of a footpath next Peckham-rye, with the southernmost house flanking upon Piermont-road (Mr. W. Stair for Mr. C. W. Chessell).—Refused.

*Width of Way and Extension above the Diagonal Line.*

*Hammersmith*.—That consent be not given to the erection of three blocks of residential flats on the west side of Queen-street, between Nos. 24 and 26 Church-lane, and the erection of a fourth block of flats on the south side of that lane next College-house, and that sanction be not given to a modification of so much of the provisions of Part V. of the London Building Act, 1894, with regard to the Section above the diagonal line as directed by Section 10 of that Act to be drawn, so far as relates to the erection of the block of flats (No. 3) at the corner of Church-lane (Mr. E. Sage for Mr. W. Moss).—Agreed.

*Width of Way, Space at Rear, &c.*

*Limelhouse.*†—That the Council, in the exercise of its powers under Sections 13, 41, and 82 of the London Building Act, 1894, do not consent to, or approve of, the erection of offices, two dwelling-houses, and a timber-store, in a yard adjoining the London and Blackwall Railway, on the east side of Island-row, Commercial-road, to abut also upon a

passageway leading out of that road (Mr. J. W. Clarke for Mr. G. Lewis).—Agreed.

*Line of Fronts, Width of Way, and Construction of Building.*

*Strand*.—An enclosed iron foot-bridge across Northumberland-street, Strand, to connect the Grand Hotel with No. 1, Northumberland-street (Mr. W. Woodward for the Gordon Hotels, Limited).—Consent.

*Line of Fronts and Deviation from Certified Plans.*

*Bermondsey.*†—That consent of the Council be not given under Section 22 of the London Building Act, 1894, to the frontage proposed to be adopted in the rebuilding of the "Royal East" public-house, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829,

rebuilding of the "Royal Fort" public-house, No. 131, Grange-road, at the corner of Fort-passage, and that the sanction of the Council be not given to certain deviations from the plan certified by the District Surveyor under Section 43 of that Act, so far as relates to such rebuilding of the premises as shown on the plans submitted with the application of Mr. C. H. Flack on behalf of Mr. R. Ireland.—Agreed.

### *Deviation from Certified Plans.*

*St. Pancras, South.*—Certain deviations from the plan, certified by the District Surveyor under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of No. 31, Whitefield-street (Messrs. J. Simpson & Son for Messrs. B. J. Hudson & Sons).—Consent.

*Strand*.—Certain deviations from the plans certified by the District Surveyor under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of Nos. 7 and 8, Rupert-street, Coventry-street, St. James's (Messrs. Shoe-bridge & Rising for Messrs. Poole & Lucas).—*Refused*.

### Formation of Streets.

**Wandsworth.**—That an order be issued to Mr. W. C. Poole, sanctioning the formation or laying out of a new street for carriage traffic, to lead out of Ensham-street into Vant-road, Tooting (for Mr. A. Heaver). That the name Dewey-street be approved for the new street.—Agreed.

*Hawthorste.*—That an order be sealed and issued to Mr. A. G. Hastilow, sanctioning the formation or laying out of a new street, for carriage traffic, to lead from Lower Richmond-road into Ashlone-road (for Mr. C. Coward). That the name Danemere street be approved for the new street.—Agreed.

*Hampstead*.—That an order be sealed and issued to Messrs. Farebrother, Ellis, & Co., refusing to sanction the formation or laying out, for carriage traffic, of a new street, 40 ft. wide, to lead from the east side of Frogna! into Arkwright-road (for Sir Spencer P. Maryon Wilson).—Agreed.

*Artisans' Dwellings.*

*Whitechapel*.—That the Council do make an order as follows:—Whereas Mr. H. H. Collins, of No. 61, Old Broad-street, City, on June 2, 1868, under the provisions of Section 42 of the London Building Act, 1844, delivered on behalf of Messrs. N. and R. Davis, at the County Hall, plans of three blocks of intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site between Brady-street dwellings, Salomon's Alms Houses and the Jews' disused burial-ground, Brady-street, Whitechapel, which plans were accompanied by an application in writing for the sanction of the Council

thereto, and by the particulars in relation thereto required by the printed regulations issued by the Council; and whereas the Council has taken the said plans, application, and particulars into consideration; now the Council does by this order disapprove of, and refuse to sanction, the said plans.—Agreed.

*Means of Escape from the Top of High Buildings.*

*Strand*.—That Messrs. Few & Co. be informed, in reply to their letter, forwarding, on behalf of the Duke of Norfolk, a further plan of the means of escape, in case of fire, to be used by the persons dwelling or employed in the two top floors of Clun House, Surrey-street, and in the floor of an extension of the Howard Hotel, Norfolk-street, to about upon Surrey-street, and asking for a reconsideration of the application and plan submitted by Messrs. White & Co. in respect of the means of escape at the premises referred to; that, the matter having been further considered, the Council sees no reason to depart from its decision not to grant the application.—Agreed.

## Buildings for the Supply of Electricity.

*Lambeth, North.*—That the Council do approve of the plans submitted with the application of Mr. W. B. Pinhey for the Charing Cross and Strand Electricity Supply Corporation, Limited, for the construction of an addition to the generating station and works at No. 85, Commercial-road.—Agreed.

Recommendations marked † are contrary to the views of the Local Authorities.

### Illustrations.

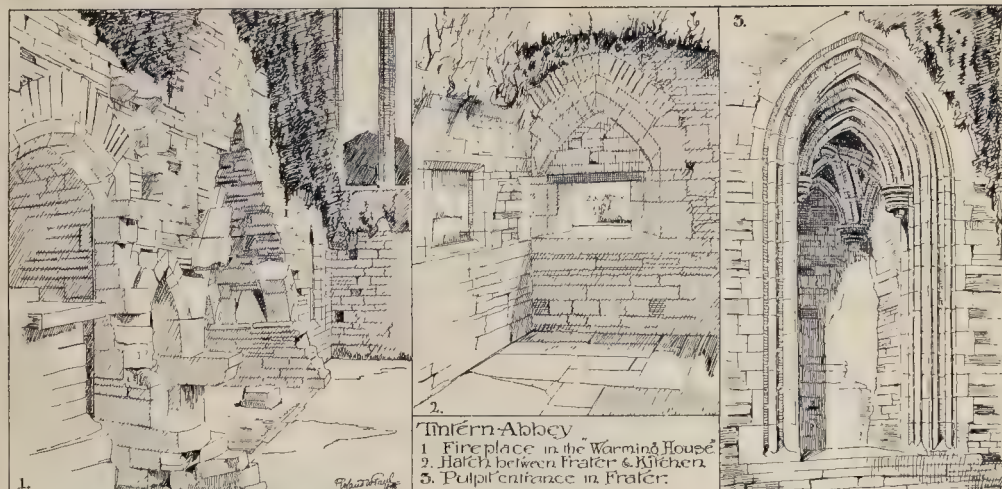
ST. PATRICK'S CATHEDRAL, DUBLIN.

**T**HIS Cathedral—one of the two which Dublin possesses—was illustrated in the *Builder* series of Cathedrals under date April 7, 1894.

The additions which are now contemplated are not without some connexion with its original scheme, uncompleted since its first design early in the thirteenth century. The first of the Anglo-Norman prelates who found themselves among the Irish in their exclusive Anglo-Norman colony in Dublin designed to have a new Cathedral on English lines, which would in time supersede the older City Cathedral of Danish origin and fashion.

Archbishop Henry, the 'Londoner', Luke, Dean of St. Martin's, London, and Fulke de Sandford, Treasurer of St. Paul's, of London, were successive builders (1220-56) of an English church on Irish soil, by the hands of English masons, and mainly with materials water-borne from England, with the exception of the oak derived from the Archbishop's hunting forests in Wicklow. After 1270 the completion of the design went no further. The south transept remained walled off to serve as a chapter-house; the north transept as a parish church of St. Nicholas Without; the Lady Chapel separated and assigned to some other use until 1804, when the late Sir Benjamin St. John Guinness found funds to remove the nar-





tioning walls, and the original design was seen as a whole for the first time.

Since that time the cathedral has been practically without any offices or accommodation for its large staff of clergy and choristers, and a movement is on foot to supply subsidiary buildings which are absolutely necessary, and no doubt intended by its original founders. The scheme proposed by Mr. Thomas Drew, the consulting architect to the two Dublin Cathedrals, has received the attention of the Fine Arts Committee of the R.I.B.A., which has reported its opinion that such an addition is a legitimate one. Unfortunately, in process of time the ample lines laid out by Archbishop Comyn around his proposed cathedral have been encroached on, and its boundary restricted, and in the plan presented the buildings are necessarily somewhat crowded. It is understood, however, that a great scheme of improvement in the surroundings of the cathedral is in view, and the church may hope to extend its borders. A private Bill was obtained last session by Lords Ardilaun and Iveagh, and Mr. James Talbot Power of Dublin, as Trustees for creating a St. Patrick's Park on the north side of the cathedral. What form this will take is not yet before the public, but a great area of slum property has already been cleared, and it is believed that, in concert with the Corporation of Dublin, these trustees have in view a vast scheme of civic improvement which extends to a regeneration of the whole miserable quarter lying partly within and partly without the old city walls between the two cathedrals of Christchurch and St. Patrick's. Widened and rebuilt approaching streets are part of the scheme, the development of which is a civic improvement of such importance as to be watched with interest, and which may also have the effect of enabling the proposed additions to the cathedral to be pushed further northward than shown on this plan, and not crowd so much on the main building.

#### TINTERN ABBEY.\*

THERE is probably no Cistercian monastery better known than Tintern, and if inferior in extent to Fountains, it claims the first place for beauty of situation, and rivals most in its architectural interest. Situated, as it is, on the banks of the Wye, about six miles above its junction with the estuary of the Severn at Chepstow, it is a good example of the romantic position that so often characterises the spots chosen by the Cistercians for the sites of their monasteries. We have already, in the present series, given descriptions and illustrations of some of the most important homes of the White Monks—Fountains, Byland, Rievaulx, and Kirkstall (all in Yorkshire), Netley in Hampshire, and Dore in Herefordshire, and we have drawn attention in former articles to the strong resemblance in



general planning that is exhibited amongst them. Tintern, besides conforming in general arrangement in planning, possesses in its church an added interest from the fact that it was practically rebuilt at a period when, at most of the above-mentioned religious houses, building operations on a large scale had ceased.

It was originally founded by Walter, son of Richard de Clare, in 1131. Nearly a century and a half later his descendant, Roger de Bigod, Earl of Norfolk, began to rebuild the church. It was commenced in 1260 and completed in 1287, Mass being said at the High Altar on October 5, 1288. In 1460, William Herbert, Earl of Pembroke, directed by his will that a hundred tons of stone should be provided for the rebuilding of the cloisters. These three points are the only ones that we have bearing on its architectural history, although the visit of the ill-fated King Edward II. to claim its

"sanctuary" on his flight from London in October, 1326, to Llantrissant, where he was captured a month afterwards, will always remain an important incident in the history of the monastery.

As will be seen by the ground plan, which has been specially measured for this series, the buildings are practically of two dates. The cloister and conventual buildings, are of the thirteenth century "Early English" in style, while the church is of very beautiful fourteenth century or "Decorated" work of at least two periods, and perhaps of three. The only later work now visible is in the south-east angle of the cloister, where there are evidences of the new design at least partially carried out, in the rebuilding of the cloisters in Perpendicular times, and also an upper story over the "warming-house" and day stairs adjoining the Frater on its east side which may be ascribed to perhaps a still later period—not long in fact before the monastery was dissolved in 1537, and surrendered by its last abbot, Richard Wych, on September 1, of that year.

Of the church built by Walter de Clare there is no trace to any extent, although, as we shall hereafter describe, one portion of the existing church may possibly be of this date. And in the monastic buildings, if we except a round-headed window over the "warming-house," none of the detail can be called "transitional." All is "Early English" work. We must therefore conclude that if any previous group of buildings existed they were entirely swept away. It seems more probable, however, that de Clare's church was built first of all, and the present conventual buildings followed in the course of years, and partook of the later developments in the architecture of the time.

The cloister court was, roughly speaking, 100 ft. square—rather more, in fact, from east to west, and rather less from north to south. The nave of the church occupied its south side (the buildings were placed north of the church, the river being on that side, and the public approach being on the south), and the other three sides were occupied by buildings on the usual Cistercian plan. On the east, beyond the north transept of the church, came the vestry or sacristy; the chapter house; a room, the use of which is not known, commonly called a parlour; and beyond again, a passage which gave access to the ground east of the monastery, and formed one of the means of connexion between it and the infirmary, a detached building some little distance eastward of which traces remain in the uneven ground. On the north of the cloister at its north-east angle is a passage which in its second bay was subdivided, the part on the east or right hand containing the "day" stairs which led to the dormitory. A doorway on the right of this passage in its first or southern bay led to a room or vestibule, which in its turn had a doorway in its north wall giving access to what is sometimes called the "Day Room," in this case a vaulted apartment six bays in length, divided into two

\* The series of the "Abbeys of Great Britain" is continued this month with illustrations of Tintern Abbey. For the list of Abbeys which have already appeared, and for particulars of future arrangements, see p. xviii.



alleys by a row of octagonal columns. Over this room, as well as over the other buildings on the east side of the cloister, was the great dortor, having at its southern end a doorway communicating with the church by the "night" stairs in the north transept. This doorway is shown on the plan, and also in the sketch of the north transept, &c., from the "Day Room." On the east of this "Day Room" are two walls, one considerably thicker than the other, probably denoting the position of the rere dortor and latrines. The traces of the drain are still to be seen in the walls, where shown.\*

The remainder of the north side of the cloister is occupied by three interesting rooms, the "warming house," the Frater, and the kitchen. The warming house was when perfect, probably a building of five bays, the central one having a hearth with a flue in the stone roof above, occupying nearly the whole width of the room, but with space for a narrow passage on each side. Everything north of the hearth or fireplace has disappeared, but its arrangement is clearly shown on the ground plan, and we give a sketch of the fireplace itself and its surroundings as seen from the north end. The Frater was a fine room divided into four bays, 83 ft. in length and 29 ft. in width. There was a large entrance from the cloister, the wall on either side of it being arcaded. The large recess east of this entrance was the lavatory. The first or southernmost bay of the Frater was not pierced, but simply arcaded. The other three bays were, however, pierced apparently on both sides by large windows, each having two pairs of trefoiled lancets with a circle in the head, an example of the "plate" tracery of the period. These windows remain tolerably perfect in two bays on the east side; the others have been destroyed. On the west side is a richly-moulded arch with a vaulted space behind it, and traces of a passage leading north from it in the thickness of the wall. This was the entrance to the reader's pulpit (it is, from the low level of its floor, evidently not the pulpit itself), and resembled formerly, perhaps, the other examples existing at Cheshire, Beaulieu in Hampshire, and Shrewsbury. We give a sketch of this pulpit entrance, and also of the hatch between the Frater and the kitchen, remaining in a very perfect state at the south-west angle of the room. Near it, on the south wall, is a square recess (also shown in the sketch). Opposite, on the east side, is a doorway leading to a small room vaulted in two bays, with a fireplace in its west wall, and lighted by a single lancet at the north end.

In the south wall of the Frater is a smaller lavatory, the drain being carried into the larger one outside. Of the kitchen little remains beyond the walls, and some traces of the fireplace and recesses.

The west side of the cloister was entirely occupied by the long range of building in which the Lay Brethren lived. It was of two stories, the lower divided into a series of rooms by cross-walls, the upper forming in part, at least, their dormitory. There were stairs at its south end, and from this point a pentice extended to the north-west angle of the church, where a short passage, carried diagonally through the north-west angle, led to the north aisle of the nave. A similar arrangement exists at Netley Abbey (see *Builder*, April 6, 1895).

The architectural features of interest in these buildings consist of a pair of lancets on the west side, with a buttress between them, and a window in what was the west gable, which has had a later window inserted in "Decorated" times. Apart from this insertion the whole is of thirteenth century date.

Of other remains of the monastic buildings are some walls north and east of the "Day Room" already noticed, traces of the water-gate of the Abbey near the river, in a north-westerly direction, and a house known as St. Ann's, now the private residence of Lady Edward Somerset, said to have been the Almonry. There is also a wall shown on Potter's plan, on the north side of the Frater, &c., about 40 ft. away, part of which is doubtless ancient.

We now come to the great church itself. The rebuilding in the fourteenth century practically destroyed de Clare's church. But at the north-west angle of the transept part of the wall shows strong indications of being of earlier date. This is shown on the plan by a thick black line. It coincides on its north side with the width of the thirteenth-century dormi-

"Tintern Abbey"  
The North Transept & Presbytery  
from the "Day Room"



tory, and although altered above and much masked by the later work below, was probably left as a support to the south end of the conventual buildings during the rebuilding. The whole of this north transept requires very careful examination, and is of interest as being the point of junction between the new church of de Bigod and the conventual buildings which at that time already existed and were incorporated with the new building.

Although the church as we see it now took eighteen years in building, the original scheme was probably pretty closely followed, if, indeed, the foundations of the whole were not, as at Salisbury Cathedral, laid down at first. It consists of a nave of six bays with aisles, a "crossing" forming, with the adjoining bay of the nave, the ritual choir, and a presbytery of four bays also with aisles. The transepts projected two bays beyond these aisles, and had two eastern chapels in each wing. There were six doorways: the principal entrance at the west end of the nave, with a smaller one at the end of the south aisle, one at the east end of the north nave aisle leading to the cloister, a fourth under the great window of the south transept, a fifth on the north side of the presbytery, and lastly the doorway to the vestry. The small doorway at the north-west angle has already been noticed.

With the exception of the westernmost bay of the nave on the north side, the central portion of the church for its entire length was divided from the side aisles by stone screens, about 11 ft. in height in the nave and 8 ft. in height in the presbytery. They vary in thickness, those in the south arcade of the nave being 2 ft. 6 in. in thickness, those on the opposite side and under the "crossing," 2 ft., while those in the presbytery and the walls which divided the chapels in the transept from each other and from the aisle were only 1 ft. in thickness.

And whereas on the south side of the nave nothing projects beyond the inner face of the screen, on the north side the plinths of the columns project except where covered by the "pulpitum" wall. This wall was about 6 ft. in thickness, and crossed the nave one bay west of the "crossing." It had, perhaps, an altar on either side of its central door.\*

This pulpitum, or screen wall, with the exception of a small fragment of paving at its southern end (shown on the plan), has been cleared away within the last twenty years. It is shown on Potter's plan, and has been copied on

the present plan from that source. Several fine fragments, which formed part of it, are now piled up on the site of the north arcade of the nave; it is shown in old engravings, and photographs of it exist.

Between the next pair of columns, west of this screen, was probably another screen, against which the nave altar was placed. Three gravestones still exist a short distance west of this. The west bay on the north side was left free to allow access for the lay brethren to their "choir" in the nave. There were doorways in the side screens also immediately west of the "pulpitum" wall, and two others, forming the "upper" entrances to the choir, near the eastern piers of the crossing.

In the presbytery it is evident from the one existing tomb, or base of a tomb *in situ*, in the first bay on the south, that the monuments were placed against the inner faces of the screen walls. This tomb has a very beautiful border of Early English foliage. The site of the high altar was probably where shown on the plan, occupying half of the bay. The remaining half would have formed the procession path, allowing the easternmost bay to be entirely given up to the two altars which were placed under the great east window, and formed, with the two at the ends of the aisles, a series of altars similar to the arrangement at Dore and Byland.\* Two altars remain in the north transept, and one in the south. At the east end of the south aisle is a recess, perhaps either for an effigy, or possibly the remains of a piscina and ambury; but it is somewhat remarkable that not a single example remains of a piscina or ambury in the church.

There are a number of gravestones, some with inscriptions, in various parts of the church. Most have crosses and one or two other devices, indicating the rank of the person interred. The only effigy remaining is now at the east end of the vestry or sacristy, and is reputed to be that of one of the Earls of Pembroke, a son of the "Strongbow," buried at Christchurch Cathedral, Dublin.† It is said to have been removed from the tomb already described, near the "crossing."

There are some slight traces of the charge on the "chief" of the shield, but not enough to identify it with certainty.

In this vestry are also numbers of paving tiles, some heraldic, including the three chevrons of de Clare, and the arms of de Bigod. In the chapter house is also a good deal of the paving still in position, and traces

\* Compare this with Netley, where the Rere Dortor remains. See *Builder*, April 6, 1895.

† See *Builder*, "Cathedral Series," March 4, 1893.

\* The arrangement here should be compared with the screens and altars recently found at Abbey Dore, described in the *Builder*, April 4, 1896.

\* Also at Rievaulx. See *Builder*, July 7, 1894.

† We gave an illustration of this effigy in the *Builder*, May 5, 1894.



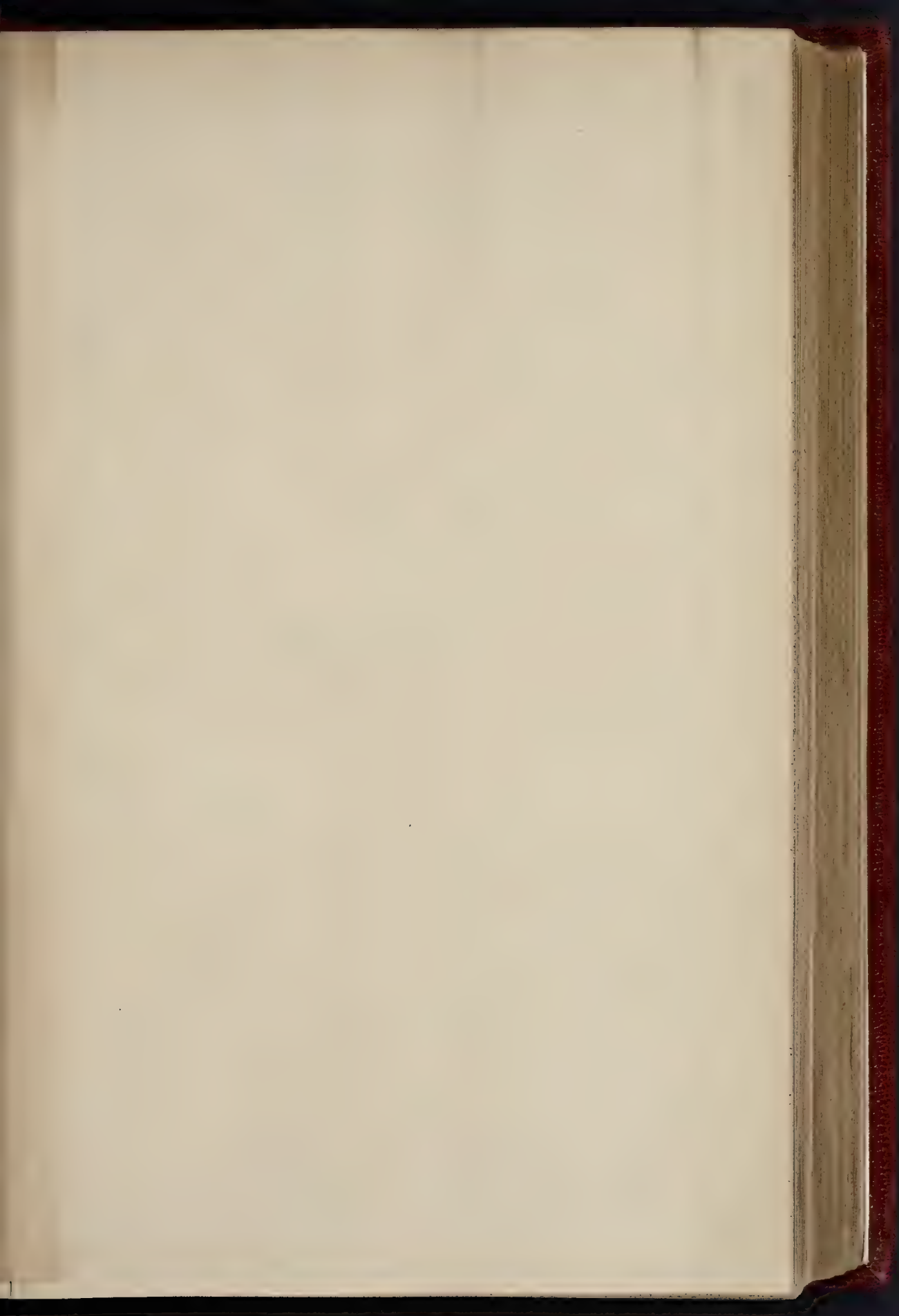


VIEW SHOWING RAISED ADDITIONS. ST. PATRICK'S CATHEDRAL, DUBLIN. MR. THOMAS DEWE RCHA, ARCHT.

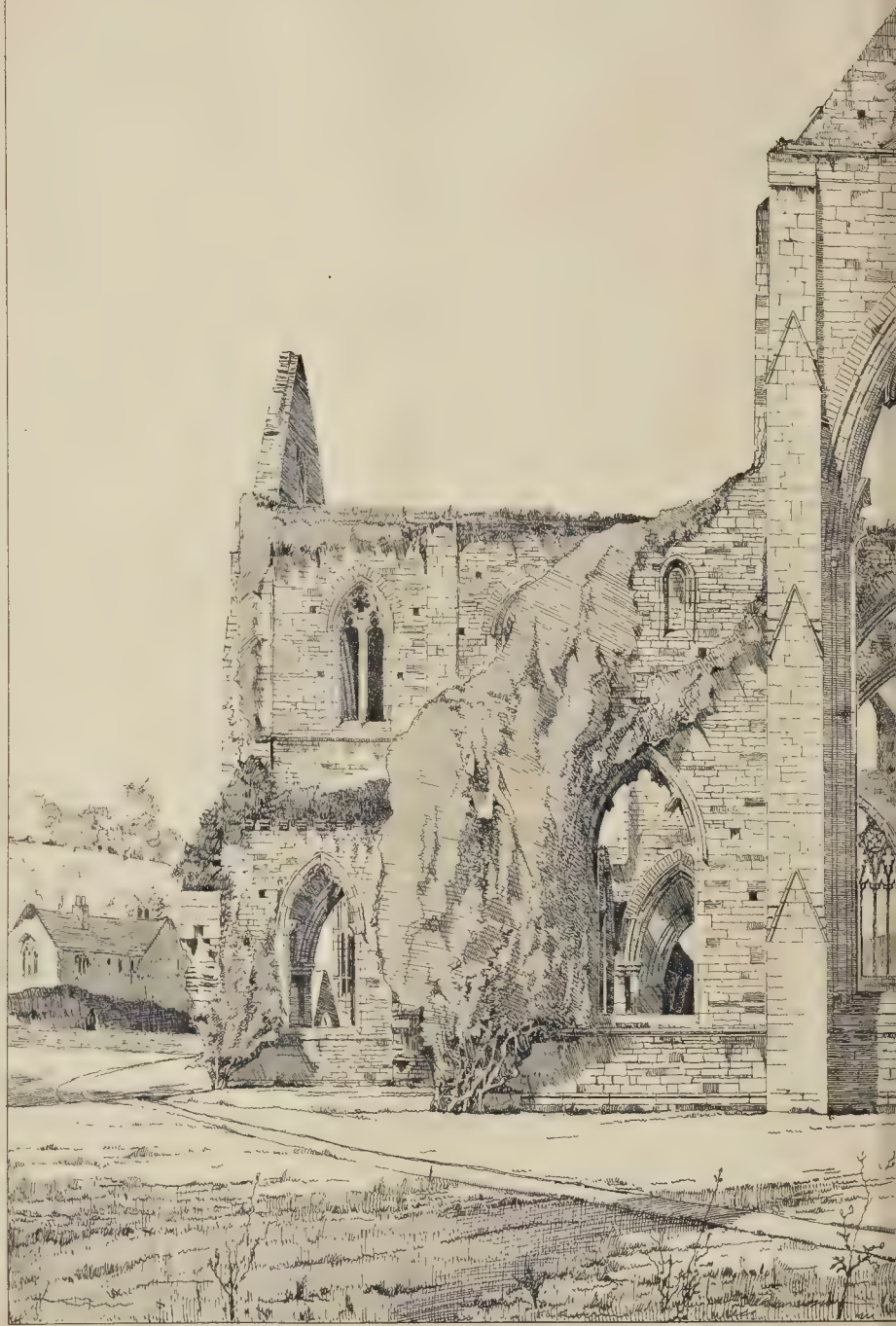












THE ABBEYS OF GREY

DRAWN BY M.



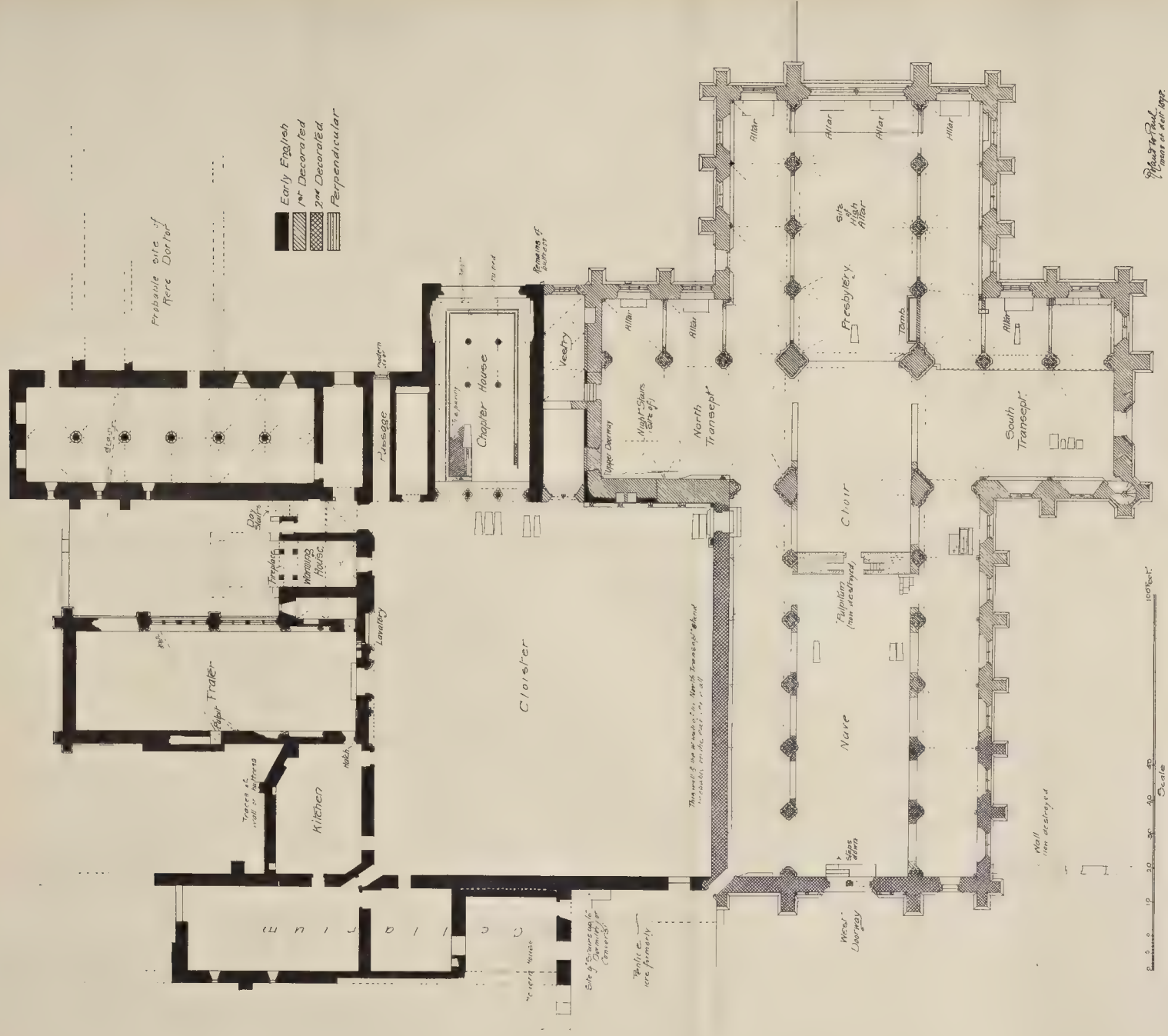


PHOTO. LITHO. SPRAGUE & CO. L. 445 EAST HARDING STREET CHICAGO ILL. E.C.



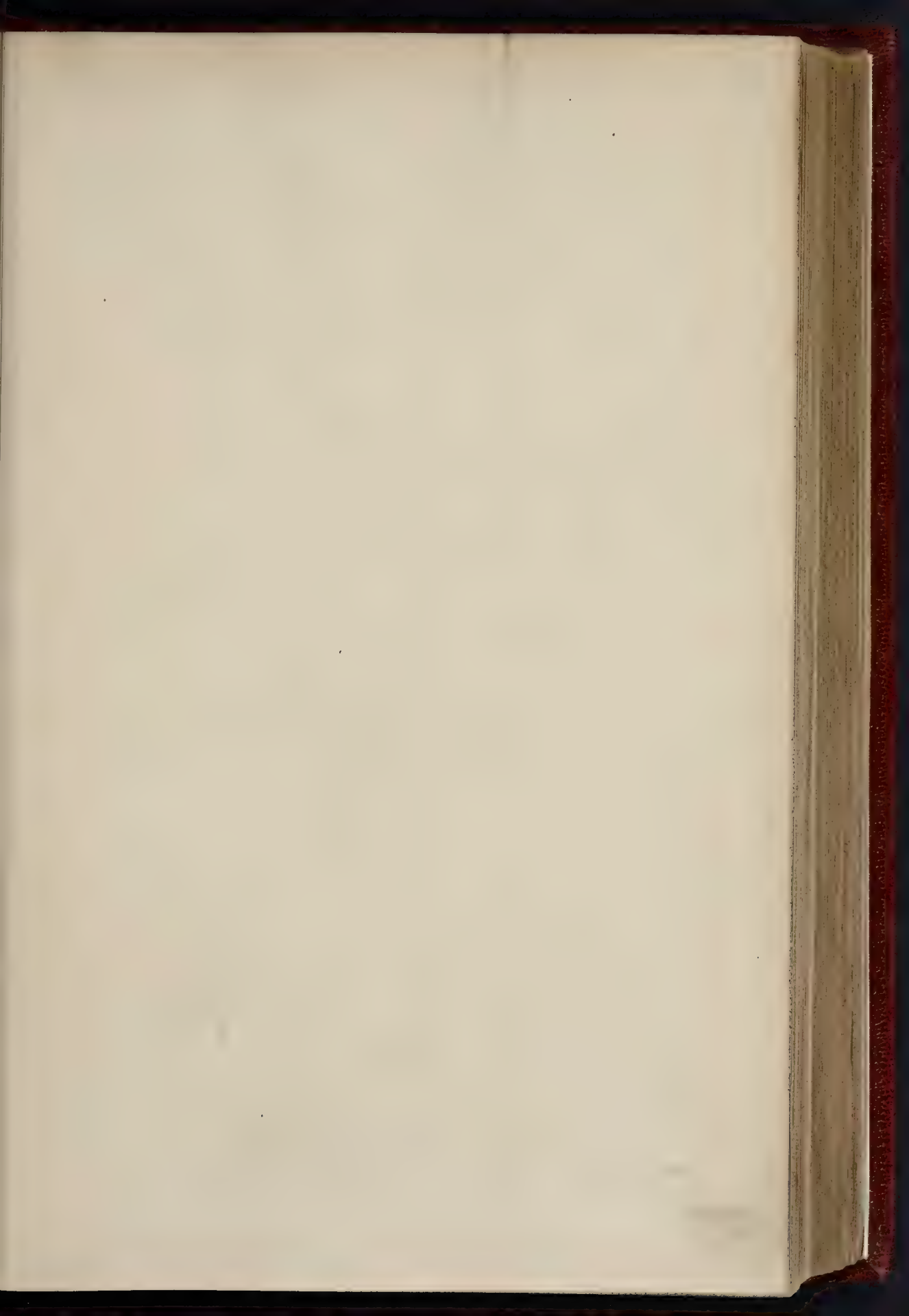


**TINTERN ABBEY**  
*Ground Plan.*









THE BUILDER JULY 2 1948



"JOAN OF ARC" BY MR. F. V. TUDMAN



"DIANA" BY MR. GUSTAV NATORE





CASKET, SILVER AND ENAMEL: BY NELSON & EDITH DAWSON.



"THE KINGDOM OF CHRIST": BY MISS ELLEN M. ROPE.

SCULPTURE AT THE ROYAL ACADEMY.







of the stone bench which surrounded the room on its east, north, and south sides.

The general features of the church are well known, but we may enumerate the chief points, with the help of the illustrations given. All the principal walls remain except the north arcade of the nave. The columns, however, remain to a height just above the plinths. The most important features of the design are undoubtedly the great windows at the east and west ends, and those of the transepts. The east window, magnificent even in its ruin, is shown in the large view. The west window, more complete, we give in the sketch of the west end. The north transept window, shortened by the gable of the dotor, we also illustrate. That in the south transept is almost completely ruined. The aisles and cloister were pierced by two-light windows throughout. The east ends of the aisles and the transept chapels had windows of three lights. The two western windows of the south aisle of the nave, and all except one (that over the cloister door) on the north side, have quatrefoiled circles in the head; the others and earlier ones have cinquefoiled or sexfoiled circles. The window over the cloister doorway more resembles those in the transept chapels and the little window at the south end of the cellarium (shown in the sketch). The three-light window at the west end of the south aisle (see sketch) appears to be an insertion, and a space is left between the label and the relieving arch, giving the appearance of old material re-used. The vaulting of the entire church has been destroyed, but the springs remain.

There seems little doubt that the presbytery, south transept and part of the nave, including the first four bays of the south aisle, are of the earliest date of the rebuilding, and the north transept was probably completed next the old wall on the west and north being used. That on the west is the thickest wall in the church, and the way it was covered on the outside by a series of weatherings is seen at



the top of the sketch we give of the cloister doorway. It is also probable that the whole of the outer wall of the north aisle of the nave is built on the foundations of the earlier church. The two round-headed recesses in the west wall of the transept should be noticed, and also the remains of the later cloister begun in the fifteenth century, and apparently to some extent completed. Hardly less beautiful than the cloister doorway is the

doorway to the vestry. The western doorway of the nave was illustrated by a measured drawing in the *Builder*, March 22, 1884, and its general design is shown in the sketch of the west front. Two walls to which we have not drawn attention should be mentioned—one, apparently on old lines, running eastward from the northern buttress of the east end; the other shown in Potter's plan, and in photographs, but now destroyed, which ran south-east of the angle buttresses of the south nave aisle, forming part of a boundary wall pierced with a simply moulded doorway of apparently "Decorated" date.

The east view of the church has been taken from the private grounds belonging to Lady Edward Somerset, by whose kind permission it was possible to complete the details of the plan on its east, north, and south sides.

Added interest has recently been given to Tintern by the announcement that it was for sale, and it is to be hoped that it may fall into hands that will deal reverently with its beautiful ruins, and preserve them as far as possible to future generations. Much damage has already been done to the ruins by the growth of ivy, and the upper portions of the walls are in serious need of attention.



#### SCULPTURE AT THE ROYAL ACADEMY.

To one of the illustrations here given, Mr. Natorp's "Diana," we referred in an article last week on "Sculpture at the Royal Academy," and need say nothing more here except to regret that the sculptor was not able to send us a photograph on a large scale, which would have done more justice to the work.

Mr. Taubman's "Joan of Arc" represents the heroine as a child, seeing visions even at that age. The work is in tinted plaster, and was exhibited last year at the Brussels International Exhibition.

The silver and enamel casket by Nelson and Edith Dawson was made for presentation to the Prince of Wales by the City of Oxford last year, on the occasion of the opening of the new City Buildings. The commission was placed in their hands by Mr. H. T. Hare, the architect of the buildings. The casket contained the key, in gold and enamel, which was used at the opening ceremony. The arms of the town are at one end and those of the University at the other, in enamel; a small panel of St. Frideswide, the patron saint of Oxford, in the lid, being also in enamel. The arms of the Prince of Wales: i.e., the Royal shield, with the label of the eldest son, surmounted by the Royal crown, and with the Royal supporters, are in front, the shield being in enamel, the other parts in beaten silver. The seated lions on the lid were chiselled out of the solid metal, as were those supporting the legs. The sides of the casket are decorated with small lions, passant guardant, and roses as national emblems.

The medallion by Miss Rope is wrongly named on the plate; it should be "The Kingdom of the Child" (a title certainly much more in keeping with the design); the mistake is due to the Royal Academy Catalogue,\* and we did not hear of it from the artist till after the plate was printed. The design is for a church decoration, to be reproduced in Della Robbia ware.

In addition to the illustrations on the plates, we give an engraving (see page 12) of Mr. Schenck's Triton panel for Shoreditch Baths, to which we referred in our article of last week.

**HADDON HALL IN DANGER.**—According to the *Sheffield Telegraph*, the entrance tower of Haddon Hall is in a dangerous state, and the Society for the Protection of Ancient Buildings has been examining and reporting on the means to be taken to protect it against possible collapse. It is recommended, we understand, that a new interior cross wall should be built as a bond to the ancient wall which is overhanging.

\* Probably it is corrected in later issues of the catalogue, but it stood so in both the large and small editions of the catalogue which came into our hands the first week of the exhibition.





"A Trilon": Bas-relief Panel for Shoreditch Public Baths. Mr. F. E. E. Schenck, Sculptor.  
[See page 11.]

#### CARPENTERS' COMPANY EXAMINATIONS.

THE annual examinations for shop and out-door foremen, &c., took place at the Company's Hall in London Wall and at their Technical Schools in Great Fitchfield-street during last week. The usual course of lectures given for the benefit of the candidates during the previous weeks had been very numerous attended. These lectures are delivered by professors of architecture and engineering and other eminent men. The number of candidates who entered for the examination was well up to that of the last two years. The average number of marks gained was in excess of that of any previous year, showing that each year a higher standard is reached. The Carpenters' Company was assisted by the usual representative Board of Examiners. The names of the successful candidates, in order of merit, are:—

*First Class:* Jno. Crowdon (Gold Medal); W. H. Betambeau and F. Hartnoll (Silver Medals); W. B. Sweet (Bronze Medal); J. Packham, T. E. Kinch; G. M. McCorquodale, and J. H. Davies. *Second Class:* W. J. Barnes; W. J. Collins; Ernest White; A. H. Walker; G. H. Griffiths; H. S. Jones; G. W. Adkins; A. H. Imber; A. Norton; W. Wintersgill; W. Forth; G. W. Filby; C. R. Tinson; A. Pringle; F. J. Griffiths. Candidates already holding the Company's certificate, who came up to improve their position and failed to do so, do not appear in this list, although they may have maintained their former position.

#### BOOKS RECEIVED.

THE STONES OF VENICE.—By John Ruskin: new edition in small form (George Allen).  
MANUAL OF FIRE DRILL.—By Commander Lionel Wells, R.N. (P. S. King & Son).  
A GUIDE TO THE ROMAN CITY OF URICONIUM.—By G. E. Fox (Adnitt & Naunton, Shrewsbury).  
"WOLFE-LAND," A HANDBOOK TO WESTERHAM.—By Gibson Thompson (Beccings, Limited).  
COPENHAGEN.—By the Danish Tourist Society (Simpkin Marshall & Co.).  
HANDBOOK TO THE WORKMEN'S COMPENSATION ACT, 1897.—By R. M. Minton-Senhouse and G. F. Emery (Demrose & Sons).  
THE OXYRHYNCHUS PAPYRI: PART I.—By B. P. Grenfell and A. S. Hunt (Kegan Paul & Co.).  
Bernard Quaritch, and Henry Frowde.

VILLAGE CROSS, MINSHULL VERNON, CHESHIRE.—At Minshull Vernon, Cheshire, recently, a village cross, which has been erected to commemorate the Queen's Diamond Jubilee, was unveiled. The design was prepared by Mr. C. E. Davenport, and the work was carried out by Mr. Henry Harding, both of Nantwich.

#### Correspondence.

To the Editor of THE BUILDER.

#### THE INSTITUTE SCALE OF CHARGES.

SIR,—I have no fault to find with the revised scale of charges as passed at the Institute meeting last Monday. But it was raised at a very small meeting, and it is not creditable to the leading architects who are old members of the Institute that they should nearly all absent themselves on the occasion of the consideration of an important document like this, and leave the questions to the consideration of a meeting only just large enough to provide a quorum, and where the places generally and naturally occupied by the most eminent members were represented by two nearly empty benches. Discussions of this kind are necessarily rather dull, but they are important, and leading-members who turn their back upon them are hardly, it seems to me, doing their duty to the Institute.

ONE WHO WAS PRESENT.

#### THE GEOLOGICAL MUSEUM.

SIR,—It may not be generally known that the Geological Museum, Jernyn-street, has been the home of good work to the working-man—carpenters, masons, metal-workers, &c.—by means of courses of practical illustrated lectures by such popular men as Professors Roberts-Austen, Rutley, Le Neve Foster, &c. Is all this to be denied to the crowded appreciative audiences which I have seen in the theatre, who could not go to South Kensington in the evenings?

ALEX. BLACK.

#### WATER TANK.

SIR,—I have to construct a water tank, to hold 100,000 gallons, which will stand on the roof of a building. The tank is to be about 100 ft. long by 60 ft. wide by 3 ft. deep of steel plates.

Would any of your readers kindly give me information as to scantlings of plates and stiffening brackets required for a tank of these dimensions, or refer me to a book or other source of information on this subject.

CONSTANT READER

\* The thickness of plates for a tank of the above dimensions is a practical question and cannot be determined by calculation due to the pressure of the water it contains. Mild steel plates or wrought-iron plates  $\frac{1}{2}$  in. thick would be quite suitable, as this thickness would allow the joints to be properly caulked and would provide sufficiently for corrosion.

The edges of the plates should be planed so that the caulking could be properly done.

The sides should be stiffened by vertical T bars 5 in. by 3 in. by  $\frac{3}{4}$  in., placed about 4 ft. apart.—E.D.

#### The Student's Column.

SOUND, LIGHT, AND HEAT.—I.

INTRODUCTION.

IN introducing this series of articles on certain phases of elementary physics to our readers it will be well to state how far we are prepared to go in considering the various subjects laid down. In the first place, we entirely exclude electricity and magnetism except so far as they may have a direct bearing upon sound, or light, or heat. We do not intend to present to deal with matter, force, motion, gravitation, and molecular attraction, or to treat specially of the chief properties of liquids and gases—all of which subjects should be included in a perception of elementary physics. Yet it is impossible to treat of either sound, light, or heat without in some way bringing in main facts concerning liquids and gases, and discussing a few of the properties of matter, force, and motion. It will be understood that with reference to these latter, however, we make no attempt at a complete or even adequate description, and that they will only be considered in their relation to the chief subjects of this series.

Neither shall we pretend to deal with all the principles included in the physics of sound, light, and heat; we shall only consider such as may be of interest to architects.

In regard to sound it will be readily surmised that the consideration of acoustic properties of buildings will be a central feature, but much preliminary work must be done in leading up to that. Although hundreds of books have been written on sound, we do not find that much is known concerning its application to the building arts. The scientist, accustomed to experimental work in the laboratory, very rarely troubles himself to inquire into the practical applications of the science on the large scale, so that, whilst we understand a great deal about sounding boards, vibration instruments, &c., there is yet much to be learned concerning the best modes of constructing interiors of public buildings from an acoustic standpoint. Indeed, when these latter are really good, the result has often been brought about more by accident than design. We are not proposing in this series to set up a number of original sketches for interiors, except in skeleton, and in explanation of principles discussed, but we shall criticise various designs and show why they have failed to produce the desired effect.

A principal part of our work will consist in describing materials specially suited for the internal construction of large public halls and for lining the walls, and we shall be compelled to say something also concerning the furnishing and decoration of the same. Methods and devices for strengthening sound and for its transmission on the large scale, its velocity in various substances, and especially in regard to its reflection, will all be considered in much detail. The subjects of echoes and resonances, the production and modification of acoustic force, the dispersion and refraction of sound come so near to the student of architecture, that although they can only be regarded as by-paths of the main roads in physics, they must here be well trodden. On the other hand, the actual methods of measuring vibrations and the production of musical notes in that connexion can only be reviewed in a very elementary way. We make this reservation, however, that so much of the science of musical sounds as is applicable to the practical designing of interiors from an acoustic point of view will receive a considerable amount of attention in this series. It sometimes happens that a hall well suited for public speaking is by no means desirable for a concert or orchestral performance, and we shall endeavor to show why this is, by an analysis of the different degrees of sounds emitted in each case, and their treatment by the surfaces with which they come in contact. The organ is often placed in a wrong position in churches, and not infrequently that instrument is turned the wrong way about, even when its location is theoretically good from an acoustic standpoint; instead of coming out into the body of the cathe-



dral, the musical notes issuing from the organ are frequently sent vibrating and reflecting from one wall to another and have to dodge round pillars and the like, which kill or mutilate the sounds. We do not say that this difficulty can always be done away with, but it can often be modified. The student will understand that in a question of this kind we shall not treat of the position of musical instruments in a cathedral in an artistic sense, but purely from a scientific one.

Consonance and resonance on the large scale (not as directly applied to music, of course), the analysis of sounds, beats, vibration of rods and plates, the study of vibratory motions, determination of the intensity of sounds, and allied subjects, will also be separately treated.

Passing to the consideration of *light*, the student will at once perceive that we are not here much concerned with artificial light, and still less with problems connected with the manufacture and nature of artificial illuminants. Daylight both direct and transmitted is the principal form we shall treat of. Our observations will arrange themselves around two subjects as centres, (1) the effect of obstructions as in "light and air" cases, though these latter will not be treated of from a legal point of view; and (2) the transmission and reflection of light from specially prepared surfaces and prisms; this includes a little optics, and has special reference to badly-lighted buildings and rooms.

By way of preparation for this part of our programme the student will be led to consider also the intensity of light, its propagation, the nature, properties, and determination of problems connected with shadows, the velocity of light, and the measurement of angles by reflection. In regard to the special subject of reflection we shall treat of the reflection of light from curved surfaces, spherical aberration, and the application of mirrors generally.

A very large portion of this department of physics is comprised under the general and practically indefinable term "optics." We have experienced some difficulty in making up our minds as to how much of this should here be given. The broad outlines of the science of "optics" are of much use to the student of architecture, but we have deemed it expedient, at any rate for the present, to select only those portions referring to prisms of different kinds, and certain forms of lenses. Lighthouse lenses will be noticed, for instance, but not those used in the construction of the microscope and telescope. The decomposition of white light, and a general account of the spectroscopic and its practical applications, the differences between spectral and pigment colours, phosphorescence, double refraction, polarisation, and problems connected with the inference of light are, amongst other things, to be alluded to in this section.

Turning to the subject of *heat*, it may be remarked that the primary points to be kept in view are the physical phenomena as applicable to heating; apparatus for heating houses will not be adverted to except by way of illustration. After explaining the prevalent views as to the theory of heat—as to its nature—we shall pass on to the general effects of heat such as expansion and contraction, also to certain phases connected with temperature. Linear and cubical expansion, coefficients of expansion and their determination in different substances used in building, expansion of liquids and gases, pressure, absorption and radiation and screens, will all come in for a large share of recognition.

#### OBITUARY.

**EX-PROVOST MATTHEWS, ABERDEEN.**—The death has just occurred, at the age of seventy-eight, of Mr. Jas. Matthews, LL.D., of Springhill, formerly Lord Provost and architect in Aberdeen. He served his professional apprenticeship with Mr. Archibald Simpson, Aberdeen, and was subsequently in the service of Sir Gilbert Scott, London. Thereafter he was in business in his native city of Aberdeen—at first in company with Mr. Thomas Mackenzie, Elgin, and afterwards in partnership with Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen.

**WESLEYAN METHODIST CHURCH, WEST STANLEY.**—The foundation-stones of new Wesleyan church and schools, which are to be built at West Stanley, at a cost of about 4,000l., were laid recently. The contract has been let to Mr. Alfred Routledge, Stanley, at 3,700l., and the designs have been prepared by Messrs. Green & Brockbank, of Liverpool. There will be a church to seat 850, with a suite of rooms on the ground level, including a schoolroom, lecture-hall, church parlour, reading-room, &c.

#### GENERAL BUILDING NEWS.

**CHAPEL, &c., CITY OF LONDON ASYLUM, STONE, NEAR DARTFORD.**—The new chapel of the City of London Asylum at Stone—the foundation-stone of which was laid by the Lord Mayor on the 18th ult.—is being erected on an isolated site to the north of the main building. The present chapel is situated over the dining hall, but owing to the necessity of providing a recreation room for the patients, it was decided, with the consent of the Commissioners in Lunacy, to make the chapel the recreation room, and erect a detached chapel, as is now done in all new asylums. The new building consists of a nave, with sloping floor, 72 ft. by 36 ft.; chancel, with octagonal end, 20 ft. by 24 ft.; and a transept on the north side, containing vestry and organ chamber. The main entrances are at the west end, one at either side for male and female patients respectively, with a small room adjoining for epileptic patients. The style adopted by the architect, Mr. Andrew Murray, is early fifteenth century Gothic. The nave is divided into five bays with buttresses, and there is a two-light window in each bay. The chancel will be lighted with five single-light windows. The roof will be on the hammer beam principle, and of oak. The exterior walls will have Portland stone dressings and flint facings, the latter being got from the cement works in the vicinity of the asylum. Extensive additions are also being carried out to the laundry. New bath blocks are being built, and all water-closets are being collected into separate blocks, with ventilated cross passages. Two infirmaries are also being erected, one for male and the other for female patients, and a new mortuary and pathological room will also be built. The total cost will be about 70,000l. Mr. Wall, Chelsea, is the builder.

**CHURCH, HINDLEY GREEN, WIGAN.**—The foundation stone has just been laid of the Church of St. John the Evangelist at Hindley Green. The portion of the church now proposed to be built consists of a nave of four bays, 54 ft. long and 23 ft. 6 in. wide, with north aisle 11 ft. 6 in. wide, chancel 31 ft. 6 in. long by 20 ft. wide, organ chamber, clergy and choir vestries. The roof is of pitch-pine, continuous through nave and chancel, the division being marked by more richly designed principals carrying an ornamental belfry. The walls and various features thereof will be treated, both inside and out, with brickwork. The complete design gives accommodation for 450 to 500 worshippers. The work now taken in hand will be seated for about 320. Mr. C. E. Deacon, of Liverpool, is the architect, and the contractors are Messrs. Preston & Hirst, of Wigan. The clerk of works is Mr. William Goulbourn.

**CHURCH EXTENSION, DERBY.**—The foundation stone has just been laid of the new tower at St. Peter's Church, Derby. The architect is Mr. Hawley Lloyd, of Birmingham, and the builders are Messrs. Walker & Slater, Derby. The cost of the work, including an extension of the aisles, amounts to 6,000l.

**CHURCH, HAWARDEN.**—Plans for the new church in the Shotton district of the parish of Hawarden have been prepared by Mr. Douglas, architect. The church, when completed, will have nave, chancel, north and south aisles, vestry, sacristy and apse. The style will be Early English, and the building will accommodate 450 persons.

**MISSION SCHOOL-CHURCH, ST. HELENS.**—The foundation-stone has just been laid of a new mission school-church in Knowsley-road, St. Helen's, in connexion with the parish of Christ Church, Eccleston. The estimated cost of the present buildings, including site, is 3,150l. The chief features of the building will be a room, 60 ft. square, with chancel, for services, and for school purposes this room will be divided by folding partitions. The building will be constructed of pressed bricks with red stone dressings. The floors of the rooms will be laid with wood blocks, and round the rooms will be a dado of glazed bricks. The contractor is Mr. Fred Brown, and the architect, Mr. G. S. Packer, of Southport.

**CATHOLIC CHURCH, DENABY MAIN.**—The new St. Alban's Catholic Church, Denaby Main, has just been opened. The building is of stone, worked in the neighbourhood. The architects are Messrs. Empsall & Clarkson, of Bradford. The mason's work has been carried out by Mr. F. Robinson, of Thornton, near Bradford; Messrs. Broadhead & Pickering, also of Bradford, have carried out the joiner's work; Mr. Lindsay, of Leeds, the plumber's work; Mr. Andrew Taylor, of Ecclehill, near Bradford, the plasterer's work; Mr. Thornton, of the same place, the slater's work; and Mr. S. Walton, of Frizinghall, near Bradford, the painter's work. The church was erected at a cost of about 5,000l.

**ST. ALBAN'S CHURCH, SOUTHEND.**—The foundation stone has just been laid at Southend of St. Alban's Church. The church will be situated in St. John's-road, in the western part of the borough. For the present, the nave and aisles only will be erected. When completed, the new church will seat about 425 worshippers, the portion at present being undertaken giving space for 300. Mr. F. Dupont is the builder, and Messrs. Nicholson and Corlette are the architects.

**CHURCH, ACCRINGTON.**—The foundation and corner stones have just been laid of the Church of St. Mary Magdalen, Accrington. The boundaries

are, to the east Devonshire-street; to the north Eccles-street; and to the west Westwood-street. The building will comprise a chancel with an organ chamber adjoining, a nave, north and south aisles with transepts, and a chapel for week-day service. Owing to the slope of the ground from north to south, the vestries will be placed under the chancel. It is intended to build the church of stone throughout. When completed it will afford accommodation for 530 adult worshippers, and the estimated cost is: for the structure, 5,260l., for the tower and spire 1,770l., and for the boundary walls 270l. The total amount required will be not less than 7,800l. The architect is Mr. Ross.

**CHURCH, WESTON-SUPER-MARE.**—The foundation stone of the permanent church for All Saints' District, Weston-super-Mare, has just been laid. The cost of the new church when completed is estimated at 6,000l. It will consist of a nave, sanctuary, north and south aisles, side chapel, vestry, sacristy, organ chamber, and north and south porches. The tower will stand separate from the church, and will form a lych gate. The church—which will accommodate some 675 persons—will be built of local stone, the external dressings being of Box ground stone, and those of the interior of Corsham Down stone. Mr. G. F. Bodley is the architect.

**RESTORATION OF THUNTON CHURCH, NORFOLK.**—The restoration of this building has just been completed, under the direction of Mr. J. B. Pearce, architect, Norwich. Mr. J. Springall, of Swanton Morley, was the contractor.

**PEOPLE'S HALL, STOKE, IPSWICH.**—The memorial stones have just been laid of this building, which is being erected for the Wesleyans. The architects are Messrs. Eade & Johns, of Ipswich. The building will be of red brick, ornamented with Gunton's white bricks. The main hall will be 56 ft. long by 46 ft. wide, and capable of accommodating about 800 persons. Out of that space are taken two gallery entrances and staircase, the gallery being over the end next the street. There will be a corridor entrance from the street on either side of the large hall, at the further end being a platform, 11 ft. by 24 ft. At the back of this are a class-room and two retiring-rooms, the floors being higher than that of the hall, as these three rooms will ultimately become the platform, when the hall is extended its full length, as it is intended to be later on. Behind this, provision is made for an organ-chamber. On the right of the large hall is a smaller one, 39 ft. long by 22 ft. 6 in., accommodating 250 persons, with a platform running the entire width at one end and recesses at the back, after the plan of the other hall.

**PRIMITIVE METHODIST CHURCH, OSWESTRY.**—The memorial-stones have just been laid of the new Primitive Methodist Church at Oswestry. The architect is Mr. J. D. Mould, of Manchester, and the builder is Mr. Jabez Higgins. The building will occupy the plot of land at the corner of Castle-street and Chapel-street, the main entrance will be from Chapel-street. The extreme length will be 69 ft., the width of the nave 36 ft. 8 in., and on each side there will be transepts. The end facing Chapel-street will be apsidal, and will contain the rostrum and seats for over sixty singers. The building will have a battlemented tower at the entrance corner, surmounted by a spire. Mr. William Hudson, of Gobowen, is the clerk of the works.

**BAPTIST CHAPEL, COMPTON, TORQUAY.**—A new chapel has just been erected at Compton for the Baptists. It will be 33 ft. by 24 ft., with vestibule, vestry, and school offices adjoining. The architects are Messrs. Bridgman & Bridgman, of Torquay, and the contractor is Mr. C. Blatchford, of Torquay.

**WESLEYAN CHAPEL AND SCHOOLS, CASTLETON, DERBYSHIRE.**—On the 23rd ult. new chapel and Sunday schools were opened at Castleton. Accommodation is provided in the chapel for 300 people. Mr. H. W. Lockwood, of Sheffield, has been the architect. The estimated cost of the new premises is over 2,000l.

**SCHOOL CHAPEL, LINCOLN.**—On the 23rd ult. the foundation-stone was laid of a new school-chapel in connexion with the Newland Congregational Church, Lincoln. The building is an extension of the Croft-street Mission. The complete scheme will entail an expenditure of about 2,000l., but the present portion will involve about 1,400l. The building, of which Mr. J. H. Cooper is the architect, will be of brick, with Ancaster stone dressings. The interior will include a mission hall, 60 ft. by 30 ft., an infants' class-room 20 ft. by 24 ft., and two smaller class-rooms, all on the ground level. The contractors are Messrs. H. S. & W. Close.

**METHODIST CHURCH, BARRIPPER, CORNWALL.**—Memorial-stones have been laid of a new church for the Free Methodists of Barrripper. Mr. S. Hill, of Redruth, is the architect, and Mr. White, of Crowan, is the builder.

**CONGREGATIONAL CHAPEL ENLARGEMENT, CALLOW, DERBYSHIRE.**—The Congregational chapel at Callow, near Chesterfield, is about to be altered and enlarged. The architect is Mr. John Parker, of Staveley.

**WESLEYAN BUILDINGS, WEST BROMWICH.**—The foundation-stones have just been laid of new buildings in connexion with the Lyng Wesleyan Church. The new premises will consist of an infants' school



and minister's vestry, and they are being erected at the rear of the present buildings. Accommodation will be provided for over fifty children. Messrs. Lloyd & Brann are the builders, and Mr. E. Pincher is the architect.

**WESLEYAN COLLEGE, SCARBOROUGH.**—A new Wesleyan College is to be erected on the Weaponness Estate, South Cliff, Scarborough. The total cost will be 7,818l. Messrs. Hall, Cooper, & Davis are the architects.

**PRIMITIVE METHODIST CHURCH, NOTTINGHAM.**—A new Primitive Methodist Church is being erected in Hartley-road, Nottingham. The new church is to be erected in accordance with plans prepared by Mr. J. Willis, of Derby. It is to provide sitting accommodation for 450 persons, and will cost 1,600l. The builder is Mr. A. G. Bell, Nottingham.

**WESLEYAN CHURCH, CARDIFF.**—New buildings are being erected by the Wesleyans in Albany-road, Cardiff. The architects are Messrs. Jones, Richards, & Bugden.

**BAPTIST CHAPEL, HORSNEY.**—The foundation-stone has just been laid of a new Baptist chapel at Ferme Park, Horsney. The new chapel will seat 150 persons; the present building, which is contiguous, being used as a school and lecture hall. The cost of the new chapel, exclusive of this sum, but including the new organ, will be 9,700l. The architect is Mr. George Baines.

**BOYS' SCHOOLS, BEXHILL.**—The foundation-stone has just been laid of a new school for Bexhill. The site is on the Hastings-road. The architects are Messrs. Jeffery & Skiller, of All floors and Hastings, and the builder is Mr. A. H. White, of St. Leonards.

**ADDITIONS TO PUBLIC SCHOOL, CRIEFF.**—A west wing is to be added to these schools. The addition consists of new classrooms, offices, and cloakrooms, &c. Contracts have been entered into for the work, and the following are the successful tradesmen:—Mr. A. Crerar, builder; Messrs. Stothard & Sons, joiners; Messrs. John Don & Son, slaters; Mr. Charles Anderson, plumber; and Mr. Forbes, plasterer. It is anticipated that the addition will cost about 1,200l. The architect is Mr. Ewan Glasgow.

**CHURCH SCHOOLS, OPENSHAW.**—New day and Sunday schools, in connexion with St. Clement's Church, Higher Openshaw, are being erected. The site is at the junction of Grasmoor-road and Tosteth-street. The buildings are designed to provide accommodation for 604 scholars. The cost will be over 3,000l. Mr. Percy B. Lodge is the architect, and Messrs. Hill & Heys, also of Manchester, the builders.

**DEAN CLOSE MEMORIAL SCHOOL, CHELTENHAM.**—A new wing is being added to the Dean Close Memorial School, Cheltenham. The new structure will be situated at the back or west side of the main body of the buildings, and parallel to it, being connected therewith by means of three corridors. The annex will be three stories in height, of red brick with stone dressings. The dining-hall, covering the whole ground plan of the building, will measure 85 ft. by 24 ft. The first and second floors are both divided by a central wall into sick-room and sleeping accommodation. The dormitories are at the north end, and on each floor provision is made for twelve boys' cubicles, with master's bedroom, together with baths, lavatories, &c. The sick-rooms consist of three wards on the first floor, containing eleven beds, with a nurse's sitting-room, bath, &c., and kitchen arrangements. On the floor above will be a sick ward, measuring 46 ft. by 24 ft. The ground floor will be connected with the present building by means of two corridors, one for the boys' use and the other giving access from the kitchen and domestic offices. The present dining-rooms, as soon as the new buildings are complete, will be converted into a physical laboratory, and library and museum, respectively. Messrs. Knight & Chatters are the architects, and Messrs. Collins & Godfrey the contractors. The price of the contract is 3,300l.

**CLUB, SOUTH SHIELDS.**—A new Unionist club is to be opened at South Shields on the 27th inst. The architect is Mr. J. H. Morton.

**NEW HOTEL, NEWCASTLE, COUNTY DOWN.**—A new hotel has been erected by the County Down Railway Company at Newcastle, County Down. The architect was Mr. J. J. Farrall, of Dublin.

**OWENS COLLEGE, MANCHESTER.**—On the 22nd ult., the Duke of Devonshire visited Owens College, Manchester, and opened the new library building, the gift of Dr. C. Christie, and laid the foundation-stone of the new Whitworth Hall. The Whitworth Hall, like the library, is from designs by Mr. Alfred Waterhouse, the original architect of the college buildings. It is to afford a hall large enough for all ceremonial purposes connected with the College and the Victoria University, and will communicate with the Christie Library through a covered cloister, the library being in turn connected with the main building by means of a bridge. The hall will be 120 ft. long, and 50 ft. wide. The dimensions of the Christie Library are: length, 100 ft.; width, 46 ft.; height to the top of the parapet, 46 ft.; and to the ridge of the roof, 71 ft. An illustration of Christie Library appeared in our issue for November 14, 1896.

**INSTITUTE BUILDINGS, ST. GEORGE'S, NEWPORT (MON.).**—The foundation-stone has just been laid in Watling-street, Newport, of new institute buildings

The buildings will be in the Gothic style, of brick with terra-cotta dressings. On the ground floor there will be a reading-room, a library, and a committee and debating-room; on the upper floor, billiard-room and a room for amateurs. The reading-room will have a flat roof, which can be used as a promenade. The library and news-room will measure 36 ft. by 18 ft. The architect is Mr. W. Fleming, of Wolverhampton; and Mr. Lavender, of Dava, will be the builder.

**PUBLIC BUILDINGS, WEST BROMWICH.**—A reading-room and police-station have been erected by the West Bromwich Corporation at the entrance to the Hill Top Park. The buildings, which have been erected by Messrs. H. Smith & Son, at a cost of 2,449l, from the design of the Borough Surveyor (Mr. A. D. Greatorex), consist of a reading-room, police premises (including two cells, and also a sergeant's house), together with a branch fire station.

**PEOPLE'S HOMES, LIVERPOOL.**—The foundation-stone was laid on the 21st ult. of "Bevington House," a model lodging-house for men, to be erected by the People's Homes Company, Limited. The building has been designed by Messrs. C. O. Ellison & Son, architects. The site has frontages of about forty-five yards to Bevington Bush, thirty yards to Nicholas-street, thirty-five yards to Aldersey-street, and forty-nine yards to Arden-street. Only a portion of this area is actually being built upon, the remainder being reserved for extensions; but the present building will accommodate 450 lodgers, whilst the scheme, when fully carried out, will provide 650 beds. The building will be six stories high with the main entrance from Bevington Bush, and the stairs will be fireproof; there will be a large open courtyard containing the water-closets, &c. The work is being carried out by Messrs. Kelly Brothers, Walton, Mr. Parsons acting as clerk of works.

**PREMISES, SHEFFIELD.**—Messrs. Harrison Bros. and Howells, cutlers, manufacturers, and electroplaters, Sheffield, have had erected a new building in Carver-street and Division-street. The architects for the building are Messrs. Holmes & Watson, and Messrs. W. & A. Forsdike are the contractors.

**VICARAGE, PENANCE.**—At Penance on the 21st ult. the foundation-stone was laid of a new vicarage for St. John's parish. The plans have been prepared by Mr. O. Caldwell, and the total cost will be about 1,300l.

**WAREHOUSE PREMISES, LEITH WALK, EDINBURGH.**—A new building has been erected for Mr. J. Brown, put-bag maker and printer, on the ground opened up at McDonald-road, Leith-walk. The entrance for the workers is at the south-east end of the building, and a few yards further west is the main entrance leading to the counting-house and offices. In the main building there is an under warehouse on the basement floor, while above there is a main warehouse. Above this is the machine-room and bag-making department, with drying-room, lithographic artists' room, case-room, stereotyping and electrotyping rooms opening off it. Messrs. Cooper & Taylor were the architects.

**RAILWAY STATION AND HOTEL, FELIXSTOWE.**—A new railway station has been erected at Felixstowe, from the designs and under the supervision of Mr. John Wilson, the chief engineer to the Great Eastern Railway. The contractors are Messrs. Kirke, Knight, & Co., of Sleaford, who have executed the work under the superintendence of Mr. Biew, of the G.E.R.'s engineering department, Mr. F. Weeber being their superintendent of works. Mr. Geo. Munnings, of Walton, is responsible for the plumbing. Facing the new station is the Orwell Hotel, the architect for which was Mr. John S. Corder. Mr. F. Bennett, of Ipswich, was the contractor.

**NEW BATHS, MORLEY.**—The foundation-stone has just been laid of new baths for Morley. The architect is Mr. G. A. Fox, of the firm of Messrs. Holton & Fox, Dewsbury. Messrs. J. & J. Sugden are the contractors for the mason's work.

**NEW LIBRARY, SOUTHWARK.**—On the 18th ult. Mr. R. K. Causton, M.P., opened the new Christ Church Public Library, in Blackfriars-road. The architect of the new building is Mr. A. W. Tribe, of Clapham-road, and the work has been carried out by Messrs. Hoare & Son of Blackfriars-road. The new building comprises a general reading-room, ladies' reading-room, and lending library.

**NEW BATHS FOR STRATFORD.**—The West Ham Corporation have instructed Mr. A. Saxon Snell, architect, to prepare plans for the erection of public swimming and private baths and other buildings in Romford-road, Stratford, E. (opposite the new T.chnical Institute).

**NEW BANK, BISHOP ACKLAND.**—Large banking premises are in course of erection at Bishop Ackland for the North-Eastern Banking Company. The premises have a frontage of 36 ft. and a depth of 52 ft. The building is three stories high, besides attics and cellars. The ground floor comprises banking-room, manager's offices, and two general offices, the rooms above being appropriated by a residence for the banking manager. The building is faced with a stone from the local quarries. The architect is Mr. Nathan Watson, of Bishop Ackland. The work has been planned and carried out by Messrs. W. and T. R. Milburn, architects, Sunderland.

**CATTLE MARKET, BIDEFORD.**—The new cattle market at Bideford is situated just a short distance from the panner market, with two entrances, one

from Honestone-street and another from Meddon-street. The total length of the market is 400 ft., and on an average it is 47 ft. wide. The whole of the pens are laid with Marlband brick, and the entrances are of Marlband brick with granite caps. In the centre of the market, occupying 27 ft. 6 in. by 49 ft. of one side, is the new public slaughter-house. The contractors for the work were Messrs. W. & H. Glover, of Bideford. The architect is Mr. R. T. Hooley, also of Bideford.

**NEW FLATS, HAMPESTEAD.**—A large building with a frontage of 250 ft. is to be erected at Mazeod-avenue, Hampstead, to be called "Priory-court," and arranged as residential flats. The site is elevated about 4 ft. above the road in front, and the building will be set back with returning wings right and left. The elevation will be somewhat "Georgian" in style, with gauged brick arches and aprons, surmounted with a heavy stone cornice and green Venetian shutters. An ornamental garden court and fountain forms part of the scheme. The architects are Messrs. Palgrave & Co., of Westminster.

**NEW BUILDING ESTATE, BENVILLE, NEWCASTLE.**—A new building estate has been opened out at Benwell. This estate is being developed by "The Tyneside Land and Property Corporation, Limited." The first contract for an entire street has been let to Mr. J. Hutchinson, of Newcastle. The work of construction will be supervised by Mr. C. T. Marshall, architect, from whose plans the houses are to be erected. In addition to this, plans are being prepared for blocks of shops and buildings of a public character by Messrs. Dunn, Hansom, & Fenwick, architects. The directors of the company have given instructions to Mr. C. T. Marshall to prepare the plans of a large building to be erected opposite the church, at the corner of the main turnpike and Charlotte Pitt-road. Bricks are about to be made on the site, machinery and plant having been laid down by Mr. Burnard of Southwood for this purpose. The surveyor to the estate is Mr. Welton, of Hexham, who has laid out the whole in streets, the drainage being carried out also under his direction.—*Newcastle Leader.*

**BRITISH DAIRY INSTITUTE, READING.**—This building, which has recently been erected in connexion with the University Extension College, Reading, consists of three departments, viz., one portion devoted to the manufacture of cheese, another to the manufacture of butter, and the third to the purposes of study in connexion with the other two. There are also offices for the manager and instructors, for the lady pupils, and a caretaker. The rooms set apart for the manufacture of butter and cheese are lined with glazed bricks, finished with concrete floors, and are supplied with hot and cold water, steam, &c. All these parts of the building are approached through a hall into which milk and other materials are delivered. The library and lecture-room is on the first-floor story. The buildings throughout are heated with hot water and fitted with the electric light. There is a basement. Externally the materials used in the building are chiefly brick and stone. The work has been executed by Mr. McCarthy & Fitt, the warming and lighting having been carried out by Messrs. Williams, the whole being from the design and under the superintendence of Mr. Ravenscroft, F.S.A., of Reading.

**NEW MANSIONS.**—The tender of Messrs. Spencer & Co., of Longwell Green, at 10,000l. for the erection of "Victoria Mansions," West End-lane, N.W. Messrs. Palgrave & Co. are the architects, and Mr. W. Pearson their clerk of works.

## SANITARY AND ENGINEERING NEWS.

**BENWELL AND FENHAM SEWERAGE.**—The Benwell and Fenham Urban District Council have instructed Mr. Harry W. Taylor, of Newcastle and Birmingham, to prepare a scheme of main sewerage for the Fenham portion of their district.

**SEWAGE OF ACTON.**—On the 21st ult. the Acton (Sewage) Bill, whereby the London County Council sought to compel the Acton District Council to contribute towards the expense of the Metropolitan drainage scheme, was considered by a Select Committee of the House of Lords. The Committee decided that the preamble of the Bill was proved, the Chairman suggesting that counsel should agree upon a clause as to the contribution to be made to the London County Council.

**WATER SUPPLY TO EAST OTTERBURN.**—The tender of Mr. Edmund Dobson, of Norpeth, has been accepted for the carrying out of the water supply to the Towers and East Otterburn. Mr. Edward Brown, of Newcastle, is the engineer.

**WATER SUPPLY, WOBURN.**—A detailed report has been submitted to the Rural District Council for a scheme of water supply for the district of Wavendon, including Woburn Sands, by the engineers for the work, Messrs. D'Albort & Son, Civil Engineers, London and Newcastle, which recommends a trial shaft being sunk about 100 ft. into the lower green sand, after which continuous pumping tests will be made for fourteen days at the rate of 10,000 gallons per hour. The site chosen is to the south of Woburn Sands, on land belonging to the Duke of Bedford, and sufficiently far from the escarpment of the lower green sand to obtain a good supply. It is probable, if the quantity of water found will allow, that several neighbouring places may be arranged to be



supplied. At present the supply is got from wells of moderate depth, many of which are liable to pollution. The water will be pumped into an elevated tower on high land adjoining, from which it will gravitate in mains over the district. If the scheme is successful, Woburn Sands, with its almost Highland scenery, will have an excellent water supply.

#### STAINED GLASS AND DECORATION.

**WINDOW, MAIDS MORETON CHURCH, BUCKINGHAM.**—The east window of this church was unveiled on the 20th ult. The ancient tracery still remains, while the glass has been destroyed, probably during the ascendancy of the Puritans. The new glass is made to match the remains of the old tracery, and depicts in five lights the doctrine of the Incarnation. The left-hand light contains a representation of the Nativity. The second light shows His entry into the ministerial life by the baptism of John in the Jordan; the third or centre light the Crucifixion, the fourth light depicts the Magdalen at the Tomb, and the fifth the Ascension. On the recommendation of Mr. Cottrell Scholefield, the architect, the work was entrusted for execution to Messrs. Percy Bacon & Brothers, of London.

**WINDOWS, &c. ST. SAVIOUR'S CHURCH, SOUTH-WARK.**—A special service was held in the Collegiate Church of St. Saviour, Southwark, on the 22nd ult., on the occasion of the unveiling of the stained-glass window in memory of the late Prince Consort, the starting of the new clock and chimes, and the unveiling of the memorial windows to Edward Alleyn and Elizabeth Newcomen by the Duke of Connaught, and the dedication of the pulpit and lectern by the Bishop of Rochester. The three windows were all designed by Mr. C. A. Kempe. That in memory of the late Prince Consort is in the north transept, and comprises four subjects. The memorial window to Edward Alleyn is in the south aisle. The Elizabeth Newcomen memorial window is in the south transept. The pulpit is of carved oak, and the lectern is of bronze, over 6 ft. high.

#### FOREIGN.

**FRANCE.**—The work of enlarging the Ecole de Médecine will soon be finished. The buildings, which are in the same style as those on the Boulevard St. Germain, will contain on the ground floor a large salle des pas perdus, a room for physical laboratory experiments, a room for the Conseil de la Faculté, and several examination rooms. A monumental staircase will lead to the first floor, on which is the library, other examination rooms, and the new galleries of the Musée Orfila. The work is expected to be completed about April. The Directors of the Louvre are shortly going to open to the public the new hall containing casts taken from the chefs d'œuvres of the principal museums in Europe. The new collection is in the old riding-school of the Prince Imperial, and is ornamented with columns, the capitals of which are sculptured by M. Frémiet.

In preparation for the 1900 Exhibition, M. Nenot is making a model of the new Sorbonne. The scale is two centimetres to the metre. When finished the model will cover a surface of twelve square metres. This delicate piece of work will cost about 25,000 francs.—The new buildings of the National Library will soon be commenced. They will extend down the Rue Colbert as far as the Rue Vivienne, and will be contiguous to the street as far as the Rue des Petits Champs.—M. Roty, the medalist, has just finished the dies for a medal in memory of the assassination of President Carnot. On the face the artist has engraved a panorama of the town of Lyons, above which is a figure of the Republic draped in mourning; by the side is the figure of Carnot stretched on a bed. The reverse shows a group of women carrying Carnot's body to the Panthéon.—Four new rooms have been opened in the Versailles Museum. They contain an interesting collection of drawings and water-colours, representing the wars in the First Revolution, and in the First Empire; also portraits of the Bonaparte family, the work of Baron Gérard.—The old church of the feastival of the Jesters de Fecamp, which is situated at the Portes de Corbeil, near Essonnes, has been put into the hands of the Société Historique de Corbeil, and an archaeological museum is to be opened in it.—In pulling down an old house at Arles belonging to the archbishopric, a portion of some ancient Roman remains was discovered. It appears to be the "Aula palatina" of the Roman Emperor.

This building, which is in stone in good preservation, has two openings in it. It probably extends under the archbishopric and under the church of Saint Trophime.—The death is announced, at the age of seventy years, of Leopold Durangel, painter. He was a pupil of Wachsmuth and Horace Vernet. He has left several interesting works, amongst them a portrait of the Chevalier d'Aguesseau, which is in the Palais de Justice, and several mural paintings in the Marseilles Museum.—The death is also announced of Madame Charles Landelle, known as a genre painter by the name of "Anais Beauvais." She was a pupil of MM. Carolus Duran and Henner.

**CONGRESS OF PUBLIC ART, BRUSSELS.**—The Department of Science and Art has received

information, through the Foreign Office, that the first International Congress of Public Art, organised by *L'Œuvre Nationale d'Art*, will be held at Brussels from September 24 to 28 next.

**MACHINERY AND MANUFACTURES EXHIBITION AT LIMA.**—We have received a circular from the Peruvian Consulate, calling attention to the permanent exhibition of manufactures and machinery now open at Lima, in the machinery hall of the Exhibition Palace, under the auspices of the Government of Peru, and under the management of the Peruvian National Society of Industry. No charge is made for space. Particulars of the exhibition can be obtained from the Consul-General of Peru, 237 Winchester House, Old Broad-street. The opportunity may be worth the attention of English manufacturers who wish for a new opening for manufactures or patents.

#### MISCELLANEOUS.

**BUILDERS' CLERKS' BENEVOLENT INSTITUTION.**—A special general meeting of the subscribers and members of the Institution, 21, New Bridge-street, E.C., on the 28th ult. Mr. Edwin Brooks, the Treasurer, presided in the unavoidable absence of the President, Mr. R. C. Foster. At this meeting, Mrs. Lydia Smith, being the only candidate, was elected by show of hands to the widows' pension of 24*l.* per annum. The proceedings closed with a vote of thanks to the Chairman.

**APPOINTMENT.**—At the usual meeting of the Middlesex County Council, held on Thursday of last week, the Highways Committee reported that there had been sixty-two applicants for the post of County Surveyor at a commencing salary of 700*l.* a year, rising to 850*l.* Ten were disqualified, and the Committee selected four, and recommended, after interviewing them, Mr. Henry T. Wakelam, of Hereford. The motion to appoint upon the terms of the advertisement was agreed to by 31 to 20.

**PUBLIC IMPROVEMENTS, DERBY.**—At the Guildhall, Derby, on the 23rd ult., Colonel W. R. Slacke, R.E., held a public inquiry on behalf of the Local Government Board into the application of the Derby Corporation to borrow the sums of 20,000*l.* for purposes of electric lighting, 5,500*l.* for the provision of a depot on the Nottingham-road, 1,000*l.* for the construction of a six-cell refuse destructor at Little Chester, 2,300*l.* for the purchase of land for the purposes of street improvement, 750*l.* and 340*l.* for the installation of the electric light at the borough asylum and Ford-street depot respectively, 340*l.* for market purposes, and 120*l.* for the erection of a convenience at the Markston recreation ground. Amongst those present at the inquiry were Mr. H. F. Gadsby (Town Clerk), Mr. J. Ward (Borough Surveyor), Mr. W. A. H. Clarry (Assistant Borough Surveyor), Mr. J. E. Stewart (Electrical Engineer), and Mr. W. Wilkinson (Chief Sanitary Inspector).

**STREET WORKS, NORWICH.**—On the 22nd ult. Major J. H. Darley Crozier, R.E., held an inquiry at the Norwich Guildhall on behalf of the Local Government Board, consequent upon an application by the Town Council for leave to borrow 5,700*l.* for street improvements. Mr. G. B. Kennett (Town Clerk) and the City Engineer (Mr. A. E. Collins) explained that this was an application for sanction to borrow a sum of money which it was estimated would be required to do certain paving, channelling, and kerbing in Tinkler's-lane, Sayer's-street, Teigham-street, Barr-road, and Station-road, which at the present time are some of the old macadamised roads of the city. These roads were all in the neighbourhood of the Midland and Great Northern Station, where the traffic had become very heavy, and granite paving was very necessary.

**MASTER BUILDERS' ASSOCIATION, MORECAMBE.**—At a meeting of the Morecambe Master Builders' Association, held on the 21st ult. in the Albert Hall, the question of insurance against the new Employers' Liability Act was discussed. The lowest rates that had been quoted to members was stated to be 22*s.* 6*d.* per hundred pounds of wages paid. The proposal to insure in the Building Assurance and Accident Association, to which special terms were offered to members of the Association of Building Employers, was favourably considered, the terms being 1*s.*

**CENTRAL SCHOOL OF ARTS AND CRAFTS.**—An exhibition of students' work in the various crafts embraced by this school (established by the Technical Education Board of the London County Council at 310, Regent-street), will be opened to the public on Monday, July 4, and will remain open daily throughout the week from 12 to 8.30 p.m. Specimens will be shown of bookbinding, silversmiths', goldsmiths' and jewellers' work, chasing and engraving, enamelling, stained glass, leadwork, stonework, woodcuts in colour (by a method based on Japanese practice), also modelling and designs for various processes. New classes are contemplated for next session, commencing September 19, in writing and illumination, wood-carving and gilding, and tapestry and other weaving. Full information as to these or other classes can be had from the Curator at the school.

**CONGRESS OF THE SANITARY INSTITUTE.**—The preliminary programme of the sixteenth Congress, to be held in Birmingham, from September 27 to October 1, has now been issued. The President of

the Congress is Sir Joseph Fayrer, Bart. Dr. Christopher Childs will deliver the lecture to the Congress, and Dr. Alex. Hill, Master of Downing College and Vice-chancellor of Cambridge University, will deliver the popular lecture. Excursions to places of interest in connexion with sanitation will be arranged for those attending the Congress. A conversation will be given by the Lord Mayor (Councillor C. G. Beale), and a garden party, at the Botanical Gardens, Edgbaston, will be given by members of the Sanitary Committee. It appears from the programme that over 300 authorities, including several County Councils, have already appointed delegates to the Congress, and as there are also over 2,000 members and associates in the Institute, there will probably be a large attendance in addition to the local members of the Congress. In connexion with the Congress, a Health Exhibition of Apparatus and Appliances relating to health and domestic use will be held as a practical illustration of the application and carrying out of the principles and methods discussed at the meetings. The Congress will include three general addresses and lectures, and three sections, meeting for two days each, dealing with (1) Sanitary Science and Preventive Medicine, presided over by Dr. Alfred Hill; (2) Engineering and Architecture, presided over by Mr. W. Henman; (3) Physics, Chemistry, and Biology, presided over by Dr. G. Sims Woodhead. There will also be five Special Conferences: Municipal Representatives, presided over by Alderman W. Cook, Chairman of the Health Committee, Birmingham City Council; Medical Officers of Health, presided over by Dr. McVail; Municipal and County Engineers, presided over by Mr. T. de Courcy Meade; Sanitary Inspectors, presided over by Mr. W. W. West, Chief Sanitary Inspector, Walthamstow; Domestic Hygiene, presided over by Mrs. C. G. Beale (the Lady Mayores). The local arrangements are in the hands of an influential Committee, presided over by the Lord Mayor of Birmingham, with Professor A. Bostock Hill, Mr. W. Bayley Marshall and Mr. J. E. Wilcox, as Honorary Secretaries.

**CARR'S PATENT LETTER BOX.**—The name of the inventor of this, mentioned and illustrated on page 621 of last volume, should have been given as "J. Carr," not "T. Carr."

**VALUE OF CITY LAND.**—A claim for compensation under the London County Council (Improvements) Act, 1897, Tower Bridge Northern Approach, was heard on Friday last week, at the London Sheriff's Court. The property is situate at the corner of Royal Mint-street and Queen-street, and covers an area of 6,716 square feet, and was announced for sale by auction by Messrs. H. E. Foster & Cranfield, the claimants' surveyors, on February last. The jury awarded 11,020*l.*

**PATENT SCAFFOLDS AND LADDERS.**—Messrs. J. H. Heathman & Co., of Endell-street, have purchased a large freehold site near Chiswick, on which they intend to erect new factory buildings to enable them to manufacture upon an extensive scale. They will also there establish a branch depot for letting out on hire their patent telescopic scaffolds as well as general builders' ladders, swing painters' cradles, and tressels, &c.

**GREAT EASTERN RAILWAY COMPANY'S TOURISTS' GUIDE.**—The Great Eastern Railway Company send us their "Tourists' Guide to the Continent," among the new features of which are particulars of the new express service to Norway, Denmark, and Sweden, viz. the Royal Mail Harwich Hook of Holland route; a series of Continental maps; a chapter upon "Cycling Routes in Holland, Belgium, and Germany"; and a chapter "Dull Useful Information," giving particulars as to the cost of Continental travel.

**THE PROPOSED EXTENSION OF HAMSTEAD HEATH.**—On the 28th ult., at the Mart, Tokenhouse-yard, Messrs. Debenham, Tewson, Farmer, & Bridgewater offered for sale by auction the freehold estate of the late Sir T. Spencer Wells, Bart., known as Golder's Hill, Hampstead Heath, and described as "a perfect country seat within five miles of Charing Cross." The biddings started at 25,000*l.*, which gradually rose to 38,500*l.*, at which price the property was declared sold. The movement to secure Golder's Hill for the public as an extension of Hampstead Heath is likely to be successful.

#### CAPITAL AND LABOUR.

**JOINERS' STRIKE, AUCKLAND.**—The joiners in the various shops at Bishop Auckland have come out on strike, after a three months' notice. They are asking for an advance of one penny per hour, a code of rules, and a reduction of the weekly hours from fifty-three to fifty. The labourers are also on strike for one penny per hour.

**ADVANCE OF WAGES TO BERWICK JOINERS.**—The joiners of Berwick a few weeks ago asked for an advance of wages, to take effect from July 1, and the masters have now agreed to raise their rate of pay from 7*d.* to 7½*d.* per hour.

**STRIKE OF WARRINGTON PLUMBERS.**—The notices served on the Warrington masters having expired, the plumbers in Warrington and district have come out on strike. The men demand an increase of 3*d.* per hour, which will bring their wages up to 9*d.* per hour.

**THE STRIKE OF SWANSEA MASONS.**—A special mass meeting of Swansea masons was held on the



22nd ult. to consider the proposal of the master builders to submit the dispute now pending to arbitration. The feeling of the men was against the interference of a third party, and a proposition to accept the offer of the masters could not find a second. It was decided not to accede to the request of the employers.

**THE BUILDING TRADE, MARAZON, CORNWALL.**—Marazon master builders have agreed to pay by the hour instead of by the day. The terms are fifty-six hours in summer, forty-eight in winter, leaving work on Saturdays at 1 p.m.; masons, 53d. per hour; carpenters, 54d.

**THE STRIKE IN THE NOTTINGHAM BUILDING TRADE.**—A full meeting of the Nottingham Master Builders' Association was held on the 20th ult. at the Mechanics' Hall, when a previous resolution, that no further advance on the present standard rate of 6d. per hour should be given to labourers, was unanimously reaffirmed. The reasons assigned for this resolution are that labourers' wages are as high in Nottingham as in most provincial cities and towns, and that plenty of men can be obtained to do the work at this wage. Builders' work in the city is practically at a standstill in consequence of the bricklayers having decided that they will not work with other labourers whom the builders may obtain. In other words, they have struck work till the Nottingham labourers are paid 6 1/2d. per hour. The meeting considered that this action on the part of the bricklayers was a distinct breach of faith with the builders and a direct violation of the signed working rules between employers and employed. It was further unanimously resolved that this action of the bricklayers, together with the whole circumstances of the present dispute, should be laid forth before the Executive Council of the National Federation of Master Builders. — *Nottingham Guardian.*

### LEGAL.

#### BUILDING DISPUTE AT BLACKPOOL.

CASE IN THE COURT OF APPEAL.

The case of the Attorney-General v. Siddall came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Chitty and Collins, on the 23rd ult. on the appeal of the defendant against a decision of Mr. Justice Kekewich in the Chancery Division restraining him building houses, without the leave of the Local Authority, fronting New-road, Blackpool, nearer the road than the front wall of the house on one side. It appeared that the defendant was the owner of the land fronting the road on the north side. At the east end of the land he had commenced to build a house on a house he had himself erected standing back some 30 ft. At the west end of the plots he was going to build on, separated by a narrow back way, there was a house more forward (about 23 ft. back). Notwithstanding that the Corporation objected, the defendant commenced to build five houses occupying the space between his own existing house and the back way, with a frontage sloping so that the end of the east house was level with the house already built next it, and the west end of the row of houses was brought forward so as to be at the same depth from the road as the house on the west of it. The question to be determined was whether what the defendant was doing contravened the provisions of Section 3 of the Public Health Amendment Act, 1888, which provided that buildings were not to be erected or brought forward in any street in an urban district beyond the main front wall of the house on either side. New-road leads out of Blackpool in an easterly direction into the country. At the end near the town there are many houses, but further on the road becomes a country road bounded by hedges and fields. The defendant contended that the houses were so far back that they could not properly be said to be built "in the street," if the road was a street, and also that the road at the spot where the houses were being placed was not a street within the meaning of the Act.

Their Lordships, without calling upon counsel for the respondents, held that the question whether the road was a street was one of fact, and also one of degree; that the road in question at one end was clearly a street, and that there could be no doubt that the houses were in the street. They, therefore, affirmed the decision of Mr. Justice Kekewich, and dismissed the appeal with costs.

Lord Coleridge, Q.C., and Mr. Cave appeared for the appellant, and Mr. Warrington, Q.C., and Mr. R. J. Parker for the respondents.

#### THE WESTMINSTER BUILDING DISASTER.

At the Westminster Police-court on Tuesday, the County Council and also the District Surveyor (Mr. Drury) had summonses in the list in reference to the collapse of Abbey-mansions, Orchard-street, Westminster. The owner was summoned for neglecting to take down the loose, cracked, overhanging portions of the walls, and Mr. W. R. Rickard, the builder, attended to answer charges under the Building Act of 1894 of omitting to construct flooring at a height of above 60 ft. from the street level of fire-resisting materials.

Mr. Sheil, the magistrate, intimated that he should adjourn the cases for Mr. Marsham to hear.

#### THE TUDOR-STREET ANCIENT LIGHT CASE.

The case of the *Christian Herald* Company, Limited, v. the Co-operative Printing Society, Limited, came before Mr. Justice Kekewich in the Chancery Division on the 28th ult.

Mr. Renshaw, Q.C., who appeared with Mr. Sergeant for the plaintiffs, said the action was brought by the plaintiffs to restrain interference with their ancient lights, which involved the necessity of a mandatory injunction. The plaintiffs were the assignees of the lease of premises in Tudor-street, Blackfriars, for a period of twenty-eight years, which was still running. The defendants were printers in John Carpenter street, and their premises which were complained of were partly in that street and partly in Tudor-street. The premises were situated in what might be called cross roads. On the opposite side of Tudor-street to the office of the *Christian Herald* Company was the former offices of the Co-operative Printing Society, which was put up about four or five years ago. This building to some extent interfered with the plaintiffs' light, and an action was brought for damages, but not for an injunction. They had nothing to do with that now. The building of which the plaintiffs now complained was erected some three or four years ago. The defendants' present building was erected on a piece of vacant land which probably his Lordship would know.

His Lordship: Yes, I think there used to be some exhibitions there?

Mr. Renshaw said there were. There was a boundary wall which might be taken as being 12 ft. high facing Tudor-street, and that was the only thing obstructing the passage of light. What the defendants did was to begin the erection of a building which, as far as he (Counsel) could make out, was originally intended to be 62 ft. high, but which the defendants had finished at 50 ft. high.

Mr. Ashton Cross (appearing with Mr. Warrington, Q.C., for the defendants) said it was never intended to have the building 62 ft. high.

Mr. Renshaw, continuing, said that Tudor-street was 30 ft. wide from wall to wall. The obstruction of which the plaintiff complained was to the windows in the basement and the windows of what was called the manager's room on the ground floor. The plaintiffs also complained of the obstruction of the access of light to two windows on the first floor.

His Lordship: I suppose the main defence is that it is lateral?

Mr. Renshaw replied that he thought the main defence was that there was no obstruction.

Mr. Ashton Cross said that the defendants were most desirous that his Lordship should go down and personally see the premises. The defendants thought that his Lordship should see the premises in the interests of justice.

Mr. Renshaw replied that the plaintiffs had not the slightest objection to his Lordship seeing the premises, but he (counsel) could not agree that it was any more desirable that his Lordship should see the premises in the interests of justice in the present case than in any other.

His Lordship said that if both parties agreed to his viewing the *locus in quo*, he would do so.

Mr. Ashton Cross: We are quite content that your Lordship should see the premises, and decide the question without hearing the evidence at all.

Mr. Renshaw: That might be the desirable from my learned friend's point of view; but I am going to call evidence to prove what I am the amount of light the plaintiffs enjoyed before the erection complained of, and what it is now. On the other part of the case, I have not the slightest doubt about it that your Lordship's offer will be accepted.

Mr. Ashton Cross: I am quite willing to leave the matter to your Lordship as arbitrator. What I mean is that we will agree not to appeal, or anything of that sort, and to leave it to your Lordship to say what shall be done in every respect.

Mr. Renshaw pointed out that the correspondence showed that the defendants had undertaken not to build higher than 30 ft. without giving the plaintiffs four days' notice, but the defendants had broken this undertaking.

Mr. Ashton Cross remarked that the defendants had gone on steadily building, and that the plaintiffs had not taken any action until the premises complained of were 48 ft. high.

Mr. Andrew Macaskie, the manager of the plaintiff company, gave evidence that the light now having access to their offices was much diminished since the erection by the defendants of the building complained of.

Mr. Michael Paget Baxter, the editor of the *Christian Herald* since its commencement, examined, said he occupied a room just above the manager's room. The new building which the defendants had put up sensibly decreased and diminished the access of light to the window of that room.

Mr. Walter Percy Hicks, assistant editor of the *Christian Herald*, corroborated the evidence of the last witness.

Mr. Renshaw said that this was all the evidence he had to call.

Mr. Arthur Beresford Pile, an architect practising at 48, Harvey-street, was the first witness called for the defendants. The witness said that he had paid several visits to the *locus in quo* to observe the sun-

shine at all hours of the morning since the defendants' building was finished. From observations he made during the course of last Saturday morning, he found that the defendants' new building did not appreciably obstruct the sunshine from the plaintiffs' building. He had measured the whole of the horizon according to the plaintiffs' windows, and found that the proportion obstructed by the defendants' new building now, which was not obstructed before its erection, was between 3 and 4 per cent.

Examined as to the manager's room in the plaintiffs' premises, the witness said that he had observed carefully that there was a sufficiency of light there for testing papers, &c.

His Lordship: Sometimes I am told that a man has got so much light he can spare some, and sometimes I hear that he has got so little that if he loses some it does not matter. I hear both arguments several times in the course of the year.

Cross-examined by Mr. Renshaw, the witness admitted that the defendants' former building affected the plaintiffs' light, but he would not say "seriously" affected it. In his opinion the word "seriously" would relate to the use made of the premises.

Mr. Jasper Keeble, the defendants' solicitor, gave evidence to the effect that he had paid several visits to the plaintiffs' premises for the purpose of observing the light to their windows, so as to be able to advise his clients on the matter. In his opinion, the defendants' building had caused no appreciable diminution of light to the plaintiffs' building. It was now abundantly lighted.

At the conclusion of this witness's examination in chief his Lordship, addressing Mr. Renshaw, said he hoped the learned counsel would keep the cross-examination within limits. In his Lordship's opinion, it would never do to allow solicitors to give evidence as experts in matters of this kind. It was bad enough to have a solicitor in the box at all.

The witness said he did not give evidence as an expert, but was simply expressing an opinion.

This conclusion of the evidence the defendants proposed to call it was arranged that his Lordship should go and view the premises in question on the following morning, after which he would give judgment.

On Wednesday, Mr. Justice Kekewich, who had been to visit the premises, said he had no alternative but to grant a mandatory injunction for the defendants to reduce the height of their building to 30 ft. by October 31. If the parties did not come to terms the question of damage would be referred to the official referee, who would inspect the premises. The defendants must pay the costs of the action.

#### REGINA v. PAWLEY.

The following is the complete report of the judge's summing-up, the result of which was briefly given in our last issue:—

"Mr. Justice Grantham: Gentlemen, this is a very important question which has been discussed by the learned counsel, because a course has been taken which perhaps will disappoint some people very much. It is quite right that this course should have been taken openly, so that every one may understand what has happened. It was a very lamentable accident, a large building suddenly falling and sending seven men into eternity at once and injuring others. Naturally people said somebody must be to blame, and somebody must be punished, and naturally somebody ought to be punished, and naturally they searched about to see who was to blame, and the first thing that was suggested was who was the architect. That is the view taken by the majority of the public generally, at any rate. Unfortunately it does seem to have been initiated by a letter written by one of the witnesses who for some reason or other was apparently so interested in some way, at any rate he seems to have made a statement in his letter which was not justified by his facts, and undoubtedly that letter seems to have influenced the minds of the jury and also the mind of the coroner. It was a very difficult matter to investigate, and I have no fault to find with the way in which the inquest was held. After a very long inquiry and a mass of evidence which took me five hours to read, the coroner came to the conclusion, on the finding of the jury, that the defendant was solely responsible for this accident, and that the negligence was culpable, and that therefore a verdict of manslaughter had been found by his jury. It was certainly unfortunate that the whole verdict was not put upon the coroner's depositions. I am not blaming any of the officers that I had not before me the exact finding of the jury. The Treasury, very properly, were desirous of knowing what view I took of this case, and I was requested specially to go through the evidence to tell them, and advise them whether in my opinion they would be justified in occupying your time for at least a week, when at the end of that time it would have been impossible to say that he was guilty.

I must say, therefore, from what I read, for the jury to have found a verdict of manslaughter against the defendant I think was a very extraordinary thing and quite wrong. I had no hesitation in advising the Treasury that they would not be justified in asking the jury to find the defendant guilty of manslaughter.

In my judgment the primary cause of the accident



was clearly the removing of the centring from the concrete.

Not being an architect, and not knowing at first what that centring meant, in going through the evidence I endeavored to find whether the exact construction of the roof was described, but failed to find any such description, and that was why I asked whether the roof was arched or not.

The conclusion I came to was—if I had to come to any conclusion as to what was the cause of the accident—that it was certainly the removal of this centring; and the accident happened immediately upon its removal. It is a very remarkable thing that the accident happened simultaneously with the removing of the centring.

While the centring, unfortunately, is being so removed a crash or a rumble or something is heard, and down it goes on to the girder below. That fell on to the girder on the next floor below, and as that fell the weight of the falling mass would be increased, and as it fell to the next floor below the weight would be greater by the weight of that floor, and so it goes right the way down with increasing weight, but it must all have happened so simultaneously that it was difficult to know whether it had fallen first. You cannot imagine how short a time the whole thing falling on the iron girder would occupy, it would only be a few seconds. Therefore I am not at all surprised that the jury found it difficult to say which fell first. You must look at the case as well as the evidence on which it is based. The allegation contained in Mr. Pawley was that there was faulty construction of the pier in two ways, that soft bricks instead of hard bricks were used and mortar instead of cement. It appeared that some one had sold 100,000 bad bricks for this work, and the statement was that they were found to be bad and were ground up for mortar, but no doubt some of them had been used for building, and the evidence of each witness is that the pier had to take the weight of something like five or seven tons per foot square, it would have made the man guilty of culpable negligence. It is also said that mortar had been used instead of cement. That, of course, would influence the jury. It is rather difficult for me to know the course the evidence took. The evidence of each witness is all put together, and the great many other witnesses were called in the interval before a particular witness was recalled, and so the matter went on, and it is almost impossible for me to follow the various statements.

I come to the conclusion, after having gone through the whole of the evidence, that there was no evidence to justify the statement that in the construction of the pier soft bricks and mortar had been used. I find there was nothing to justify the statement except Collina's statement. In my opinion, that is a false statement; but whether intentional or not, I do not say. I come to the conclusion that it was a false statement of fact, and that the pier was not made of soft bricks, but of proper hard bricks and cement, and that when it was examined it was found to be of good solid construction.

That being so, and there being no evidence whatsoever that the cause of the accident was the collapse of the pier and the accident being through no fault of the accused, and the fact being that this concrete does require a considerable time to set, and you ought to take the extreme view with regard to the period of setting, instead of the shortest time; and again there being a doubt as to the composition of the concrete, and whether a certain class of material had been used and required a lengthy period to dry; on these questions I came to the view that the real cause of the accident was the removing of the centring from the concrete, and at any rate so far as this trial was concerned, it would be most unfair to ask any one to find the prisoner guilty where some one else, if any one, was guilty, and consequently the whole time would have been wasted by holding the inquiry over again, and therefore I advised the Treasury, perhaps I should not say that, but I did suggest this course should be adopted. The whole matter has been thoroughly investigated, and you will say, therefore, that the prisoner is not guilty.

The Clerk of the Court: You say, gentlemen, the prisoner is not guilty?

The Foreman: Not guilty."

## MEETINGS.

MONDAY, JULY 2.

*Liverpool Architectural Society.*—Third excursion. By permission of Mr. T. H. Ismay, a visit of inspection will be made to Dawpool, Thurston.

*Northern Architectural Association.*—Excursion meeting at Durham.

WEDNESDAY, JULY 6.

*Royal Archaeological Institute.*—Professor B. Lewis, M.A., F.S.A., on "Roman Antiquities in South Germany."

*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting of the members. 8 p.m.

SATURDAY, JULY 9.

*Institution of Junior Engineers.*—Excursion down the river by P.S. Alexandra. Leave Westminster Pier 15 p.m., calling at Temple, Old Swan, and Woolwich.

## RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until August 8.

[1897] 13,553.—CHIMNEY AND VENTILATING: *T. A. H. Jordan.*—The top or pot has a cover fitted at a fixed or variable distance above it; the space between them is surrounded with a band made in the shape of two truncated cones fixed to the walls.

13,554.—ELECTRICAL AND PREPAYMENT ELECTRICAL METERS: *C. O. Bastian.*—A U-shaped tube, whose two parts are secured together by a rubber block, is filled with water, which is decomposed by a current flowing through adjoining electrodes; the consequent variation in the height of the water is registered by an index or scale on the arms of the tube for a current meter, or for a prepayment meter, by means of a float (in one of the arms), to which is attached a wire forming one of the two contacts in a "local" circuit; the other contact is effected by mechanism as described in Patents 2,224 and 16,342 of 1896.

13,559.—CLIMBER, LEVEL, AND PLUMBING INSTRUMENT: *M. G. J. Clemen.*—This consists of the combination of a metallic box, whose upper and lateral sides are open, with a balance oscillating on an axle and bearing a counterpoise at its lower end and hands at its upper end; the hands move over a circular graduated scale, the gradient in lineal measure or the angle in degrees, and a sight-glass is adjusted for levelling purposes.

13,571.—RELIEFS, MOULDS, AND THE LIKE: *F. Rieder.*—This device, of metal, is formed by the electrolytic process of casting or cutting in a block of say, gypsum or earthenware, a negative of the article, treating as an anode the metal to be formed, and pressing it gently on the block's negative face, saturating the block with a suitable electrolyte, and connecting it with a cathode.

13,585.—TO FACILITATE THE DRAWING OF OBJECTS IN CORRECT PERSPECTIVE: *J. H. Appleton.*—The instrument has two flexible arms joined with a bolt and thumb-screw in position of adjustment, one of a disc and screw; a scale of degrees radiates from the point of rotation, and the two arms are scaled so that the relative proportions of parts may be ascertained.

13,604.—DRAWING BOARD: *J. S. Wilkes.*—A series of rows of punches is combined with a moveable perforated bottom-plate or plug in the die, and with a rising and falling perforated guide plate and indent plate, the guide plate having a series of holes, the die and indent plate withdrawal of the punches, when side rods raise the plates to permit removal of the pressed and perforated brick from the die, and feeding of another moulded brick thereinto.

13,625.—CREATING CHIMNEYS: *E. G. A. Prendergast.*—The stopper has a double bottom, and is retained in position by a cross-piece and two flat bolts; the false bottom is divided into two parts, whereby the upper turns on hinges on the lower, the fall is so arranged that the stop the chimney, its fall is caused by the melting, at an abnormal temperature, of a nut which sets in motion a spiral spring.

13,631.—CASEMENTS AND WINDOW FRAMES: *W. A. S. Benson.*—The casements or frames have mullions made of cylindrical metal rods or tubes, and with metal transoms having annular or segmental sockets at each end to fit around the mullions so that they can be set at any angle around them, when, e.g., a bay window is to be made.

13,648.—BRUSHES FOR PAINTING, &c.: *A. Hibbert.*—The whole catch is formed of wire catches or metal rings projecting just above the binding at each side of "sash tools," varnishing, painting, whitewashing, and all other such brushes as need to be bridled; as the bristles wear away the bridling may be used easily, and on unwinding a few coils, the ends may be passed through the rings to tie the twine again without removing the entire bridling.

13,657.—FRESH WATER CLOSETS: *J. Duckett & Son and J. Duckett.*—For securing the seats the usual metal supports are dispensed with, by forming in one piece of ware with the closet a table or shelf that extends backwards to within three inches from the wall and receives a water-lack; integral with the table or shelf are formed a vertical inlet for the fall-pipe, and two conduits, one on either side of the basin, to communicate with the flushing rin.

[1898.] 110.—ANTI-CORROSION COMPOSITION OR PAINT: *W. Pease.*—The inventor takes ten parts of gum euphorbia dissolved in fusel oil, five parts of coal-tar mixed with one part of slaked lime, and one part of gum dammar dissolved in benzine; he then takes one part of graphite, one of oxide of zinc, and the pigment for colour, adds these latter to the base, and thins the admixture with benzine, or turpentine, or other spirits; when ground it is ready for use.

6,595.—KEY OR WRENCH FOR STOP COCKS OR SCREW-DOWN FERULES ON HOUSE SUPPLIES FOR THE USE OF TURNCOCKS, PLUMBERS, GAS FITTERS, &c.: *C. Sainty.*—For stop and supply cocks below the ground's surface, and to provide a grip when the tap's crutch is broken off, the inventor forms a crutch or a cross-bar on one end of a tube, the other end having a ferrule, screw, &c.; a portion of the tube is threaded or coned for engagement over grip-pieces or jaws joined to the rod's end, and the rod has a cross-bar; the grip-pieces can open or close to fit any size of tap crutch, spindle, &c.; or the ferrule of a screw-down tap if a fresh washer is required.

6,593.—SHEET METAL LATHING: *J. A. Willmore.*—The sheets are prepared by making long perforations in pairs, so that the metal is cut or slit along one side of each perforation only, and is then forced downwards to leave the displaced metal at nearly a right angle to the sheet, each pair of perforations have a thin strip of metal left between them, and the portions forced down are on the side of each perforation removed from the central strip, so that the parts forced down form a dovetail key for the plaster; the roller machine consists of fluting, slitting, and shaping discs built up into rollers, with fixed bottom knives and scrapers.

8,246.—ROOFING TILE: *W. Borgolte.*—The quadrangular tiles for diagonal and for rectilinear roofing have interlocking grooves and ribs, for air-spaces therein; each tile has a threshold support, lower side having also three projections, one at the corner, to support it in diagonal roofing, the two others, at the sides, in rectilinear roofing.

9,165.—FLOORS, WALLS, PARTITIONS, &c.: *H. L. Cunniff & H. A. Hughes.*—To obviate the necessity for centring, the foundation or support of the plastic material is made of corrugated, dovetailed, and perforated metal, imbedded therein; the framework of a wall or partition is made of I or channel iron or steel uprights secured by similar sills at top and bottom; the sheets, with their corrugations horizontal, are lowered into the uprights, or inserted sideways.

9,331.—DIVIDERS, APPLICABLE FOR THE DEMONSTRATION OF MATHEMATICAL AND ANALOGOUS PROBLEMS: *F. H. de Tray & T. R. Stedding.*—The oppositely-extending long and short arms are so mounted as to enable the points of the short arms to lay off decimal parts, or a multiple, of a unit that is indicated by the points of the long arms. The arms have segmental scales set concentrically with the pivot of the members, which consist of quadrant plates whereof each carries a long and a short arm.

NEW APPLICATIONS.

June 13/98.

13,164, H. S. Verity, Electric Switches. 13,165, E. H. Parkinson, N. Lines; and 13,537, R. G. Howson, Flushing Clusters. 13,166, Besson & O'Brien, Micrometer Callipers. 13,190, E. T. Phillips, Wrenches or Spanners. 13,194, G. Wilkinson, Outdoor Electric Lighting. 13,206, Watson & Sandford, Scales. 13,210, R. Lundell, Electric Heaters. 13,230, Lucas & White, Fire Escapes and the like. 13,241, J. McKay, for Magnetically Treating Tool Blades, &c. 13,248, O. E. Winger, Glass Panes. 13,257, Ellis & Street, and 13,473, S. Saunders, Ventilators. 13,259, W. Schooling, Micrometers. 13,260, F. Schunian, Wire-Glass. 13,267, W. Black, 13,272, D. Barnold, Moulding Machines. 13,273-4, C. P. Steinmetz, Electrical Distribution. 13,276, J. McCammon, Flushing Tanks. 13,278, Cook & Hubbard, Revolving Cutters for Moulding, Tenoning, Relieving, and similar Machines. 13,291, W. R. Baird, Grilled and Venetian Ironwork. 13,292, La Soc. Aubrey & Morel and A. Blondeau, a Gas Motor. 13,293, R. D. Workman, Spacing Mechanism for Brick-cutting and Other Machinery. 13,300, C. Bruns, Electric Shades, and Covers for Electric Lights. 13,301, G. Florack, Filtering Apparatus. 13,304, A. M. Arter, Electric Arc Lamps. 13,311, E. S. Prentice, for Gauging the Rate of Flow of Water from Outlets or through Pipes. 13,316, J. L. Lara, Telephone Installations. 13,323, D. Griffiths, a Building Brick. 13,324, Ward & Toms, Street and Other Gully Traps. 13,329, E. F. Irtam, an Adjustable Cramp. 13,337, Hindle & Warburton, Bricks, Tiles, and Other Clay Goods. 13,346, F. Pulda, Fireproof Floors or Ceilings. 13,347, Brearley & Tomson, Refuse Bucket for Sinks, Drains, Fall Pipes, Urinals, &c. 13,348, A. Hogg, Road-edge Trimming and Scarifying Machinery. 13,354, Taylor, Lang, & Co. and Others, Moulding Machinery. 13,370, Wilders, joint for Rail Tanks, &c. 13,372, Donnelly & Milroy, Drain and Sewer Traps. 13,379, Smithurst & Greig, Attachment of Fencing-wire. 13,377, Olsson & Brims, Tool for Excavating Clay or other Hard Material. 13,384, H. Chauden, Rotary Motors. 13,386, La Soc. A. des Faïenceries de Cécil et Montcaumon and Another, Kilns or Ovens with Travelling Hearth. 13,389, R. T. Hughes, Perforated Bricks, &c. 13,398, F. von Erhardt, Boring Machines. 13,399, M. Dery, Combined Application of Continuous Alternating Currents for Exciting Magnetic Fields, and Apparatus for so Producing Electrical Energy and Mechanical Power. 13,407, J. Hargreaves, Flexible Ladders, Fire-escapes, &c. 13,409, W. D. Mauld, Combined Boiler, Bath, Sink, and the like. 13,421, W. C. Williams, "Improvement on the Ordinary Standard for Measuring Height Presently in Use." 13,435, S. Farnell, Window Casements, &c. 13,438, Wanklyn & Cooper, Treatment and Purification of Sewage. 13,446, R. G. C. Burn, Expandable Drain Plugs or Stoppers. 13,447, R. G. C. Burn and Others, Apparatus or Appliances for Use with Drain Plugs or Stoppers. 13,450, J. W. von Pütler, Lathes. 13,468, L. T. B. Sanderson, a System of Telephone. 13,471, G. F. Wright, Astragals, and for Securing Glass in Roofs. 13,478, Johnson & Lundell, Electric Control. 13,487-8, "Canon" Hollow-Ware Co. & Another, Gas Cooking Stoves. 13,505, C. H. Bee, Slide Rules, Measuring Rules, and Tabulated Rules. 13,518, R. G. Restall, Cleaning and Repairing Drain and Other Pipes or Conduits. 13,526, A. Fauch, Firing Wells. 13,527, L. T. B. Sanderson, Telephone Cables. 13,567, H. W. Wollaston, for Increasing the Pressure of Gas Supplied to Burners. 13,569, J. H. Barker, Joining Electric Cables. 13,583, A. Hogg, Water Taps. 13,594, J. Miley, Fast Head Stocks of Lathes. 13,599, D. J. Peebles, Coin-fired Prepayment of Fluid Meters. 13,603, W. Johnson, Pressing Perforated Ventilating or Ornamental Bricks, &c. 13,611, A. Burridge, an Iron Joint. 13,617, J. J. Tylor, Rotary Water Meters. 13,621, H. Stammel, Safety Lock. 13,635, J. T. Szek, Floors and Walls.

## SOME RECENT SALES OF PROPERTY

### ESTATE EXCHANGE REPORT.

June 13.—By LEOPOLD FARMER.  
Willesden.—18 and 20, Connaught-rd., u.t. 73 yrs., g.t. 164, e.r. 90d. .... £885  
Hanover-sq.—7, George-st., area 2,600 ft. s. .... 7,250  
Aston, Herts.—"Bareleigh House" and 6 a., u.t. 105 yrs., g.t. nil. .... 2,800  
By KING & CHASEMORE.  
Rudgwick, Surrey.—"Hyes Farm," 200 a. r.r. 9 p., f. and c. .... 3,000  
Sinfold, Sussex.—Four enclosures of land, 28 a. 8 p., f. .... 1,125  
By INMAN, SHARP, HARRINGTON & ROBERTS.  
Notting Hill.—75, Chesterton-rd., u.t. 73 yrs., g.t. 37. .... 390  
Lambeth.—A two-min. walk to the station, 10 a., u.t. 41 yrs., g.t. 175d., l. 1,023d. 8s. .... 1,450  
By C. SPARROW & SON.  
Finchley.—1 and 8, Grove-rd., u.t. 97 yrs., g.t. 111, r.r. 8, 54d. .... 540  
By A. THOMAS, PEYER, & MILES.  
Little Compton, Warwick.—The Compton Steam Brewery, with 30 licensed houses attached, f. .... 35,200  
By J. H. BETHELL (at Barking).  
Barking, Essex.—Longbridge-rd., &c., 154 plots of building land, f. (in lots) .... 7,542  
June 14.—By A. BLACKFORD.  
Paddington.—39, Cirencester-st., f., r. 55f. 18s. .... 365  
Hackney.—5, Queen's Down-rd., f., r. 55f. .... 250  
Kensington Town.—35, Haverstock-rd., u.t. 65 yrs., g.t. 6d., e.r. 36d. .... 355  
Hampstead.—26, Lisburne-rd., u.t. 82 yrs., g.t. 7d., l. 42d. .... 420  
By DRIVER & CO.  
Welford, Northants.—"Welford Estate," 1,504 a. r.r. 13 p., f. .... 25,000  
Camden Town.—Camden-rd., i.g.t. 130f., u.t. 21 yrs., g.t. 30d. .... 1,200



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Reconstruction Works, King street, and New Wynd	Glasgow Corp.	100l. 50s. 25s.	Aug. 31

## CONTRACTS

[illegible]

## CONTRACTS—Continued.

[illegible]

### PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
Drainage and Buildings Inspector.....	With U.D.C.	140 per annum .....	July 4
Chief of Works .....	Boardford Union	30 per week .....	do.
Superintending Foreman .....	Boardford Vestry	8 14 per week .....	July 6
Assistant Inspector .....	Gloverston Corp.	55 14 per week .....	July 11
Chief Engineer and Surveying .....			
Assistant Building and Drainage .....	Huddersfield Corp.	180 per annum .....	July 12
Inspector .....	do.	120 per annum .....	do.
Temporary Surveying Assistant .....	do.	1 10 per week .....	do.
Head of Sewer .....	do.	180 per annum .....	do.
Chief of Works .....	Strimlingham Corp.	300 rising to 400 per ann.	July 13
Inspector .....	Barnford	14 per week .....	do.
Chief of Works .....	Harast U.D.C.	50 per week .....	July 16
Tierce Assistant Surveyors .....	Six Rivers and Coast of Africa	paid to 400 per ann and free passage .....	No date

Those marked with an asterisk (\*) are advertised in this Number. Competition, p. — Contracts, pp. iv, vi. & viii. Public Appointments, pp. xix. & xxi.

By BEAN, BURNETT, & ELDRIDGE.	35 and 37, Viceroy-st., ut. 44 yrs, g.r. 154, r. 744, r. 100.	£560	Pimlico—63, Winchester-st., ut. 30 yrs, g.r. 94, r. 604, r. 100.	£355
Horton.—St. John's-rd., "The Ivy House" p.h., and 1 and 3, Evelyn-f., ut. 34 yrs, g.r. 104, r. 1,040, r. 1,040.	£5,450	300	By WILKINSON & SHELTON.	
St. John's-rd., g.r. 94, reversion in 254 yrs.	300	274.	Sidcup, Cent.—Highview-rd., "Redcot," f. 100, r. 104, r. 104.	1,700
Ivy-st., f.g.r. 7, 135; also a peppercorn g.r., reversion in 25 and 26 yrs.	1,509	199.	104, Otley-ter, f. r. 104.	3,700
Ivy-st., f.g.r. 135, reversion in 26 yrs.	1,509	199.	St. George's-rd., 13 freehold cottages, r. 264, 124, r. 104.	3,020
Ivy-st., two peppercorn g.r.'s, reversion in 26 yrs.	605.	By G. HEAR & CO.		
St. John's-rd., ut. 31 yrs, g.r. 34.	1,115	Cierkenwell.—9, 80, & 81, Myddelton-st., and 14, and 15, Garland-st., ut. 12 yrs, g.r. 804, r. 1884.		
By FIELD & SONS.		By HARLAND & SON.		
St. John's-rd., ut. 244, 145, r. 1394.	2,860	Arkeley, Herts.—"Arkeley Rise" and 49, a. o. 36 p. 1.	6,020	By MESSRS. POSTER (at Pall Mall).
Ankerley.—78, 80, and 82, Croydon-rd., f. r. 1904.	930	Belgravian.—9, William-st., ut. 304 yrs, g.r. 54, r. 260.	3,870	Maida Hill.—59, Howley-pl., ut. 39 yrs, g.r. 154.
Peage.—50 to 64 (even), Maple-rd., ut. 494 yrs, g.r. 254.	930	85, Westminster, ut. 23 yrs, g.r. 54, r. 554.	400	By MORETON RICHES (at Clapham Junction).
St. John's-rd., and Cottage Grove, ut. 70 yrs, g.r. 104.	5,880	By HUNTER & HUNTER.		
Wandsworth.—22 and 24, Elsiepl-rd., ut. 92 yrs, g.r. 144, r. 144.	5,880	Camden Town.—Little Randolph-pl., ut. 144 yrs, reversion in 144 yrs.	835	By STEPHENSON & ALEXANDER (at Cardiff).
St. John's-rd., and Cottage Grove, ut. 70 yrs, g.r. 144, r. 144.	5,880	Kennington.—Abingdon-rd., ut. 144 yrs, reversion in 64 yrs.	470	Porthcawl, Glamorgan.—14, West-st., & Co. g.r. 254, 154, 54, reversion varying from 10 to 97 yrs. (in lots).
St. John's-rd., ut. 704, r. 7704.				7,400



# TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 4 p.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list but the lowest. Tender is understood to be, unless in some exceptional cases and for special reasons.]

**ABERAVON (Wales).—**For additions to the parish church, for the Rev. Henry Morris and Building Committee. Mr. G. E. Halliday, architect, 14, High-street, Cardiff. Quantities by John W. Rogers, surveyor, 14, High-street, Cardiff:—  
 E. J. Davies ..... £594 1 1  
 N. Cox ..... 1,976 0  
 D. Jenkins, Swansea? ..... 1,724 1  
 T. Watkins & Co. .... 1,971      \* Accepted.

**BERKS.—**For the foundations for the proposed new buildings of the County Hospital, at St. Giles, High-street, Reading:—  
 K. Talbot ..... £4,754 A. Walters Spencer ..... £4,321  
 C. Ford ..... 4,404 Bennett & Linsley, Oxford? 3,962  
 W. Hawkins ..... 4,404      \* Accepted.  
 E. W. Thomas ..... 4,404

**DEWSBURY.—**Accepted 4 tenders, &c., to Mosaic Tissue, Halifax-road. Mr. J. Lane-Fox, architect, Bond-street, Dewsbury:—  
 Mowbray, &c. .... Mark Scott, Earlestown ..... £348  
 Tailors and Carpetmen ..... Armitage & Son, Dewsbury 191  
 C. Ford ..... W. K. Thompson, Dewsbury ..... 97  
 Plumbing and Glazing ..... Henry Blackburn, Dewsbury 119  
 Plastering ..... C. Newall, Batley ..... 70

**EYEMOUTH (Berwickshire).—**For the construction of a sea-wall, for Messrs. Muir & Sons, engineers, 7, York-place, Edinburgh:—  
 L. Miller ..... £5,742 to 0 J. Morris & Sons ..... £5,670  
 Milner Fortune ..... 5,693 6 A. Alex. Brunton & Co. .... 5,670  
 Archibald ..... 5,129 4 Scott ..... 5,670  
 H. C. Bechoer & Co. 7,905 8      \* Accepted.

**FEATHERSTONE.—**For the erection of a new mixed school, for the Featherstone School Board. Mr. W. Hamilton Pearmain, architect, Featherstone, Cheshire. Quantities by John H. McEwen ..... £5,553 Milson Dixon, Ackworth? 7,945  
 J. Clement ..... 5,553 A. S. Sutton ..... 3,664  
 Jackson Bros. .... 5,597 P. H. Curry ..... 7,793  
 \* Accepted subject to the Education Department's consent.  
 † Tender withdrawn.

**HATFIELD (Herts).—**For the erection of two pairs villas, for Mr. John De Vail, Mr. F. J. Ballam, architect:—  
 W. Rhind & Son, 21, Pall-mall-old, St. W. .... £1,579

**LONDON.—**For the erection of Wesleyan Church in Bermondsey New Church, with shop &c., for Messrs. J. Chas. Bell, architect. Quantities by Messrs. C. Stanger & Sons:—  
 W. Downes ..... £9,593 Gold ..... £1,400  
 J. Greenwood ..... 53,469 J. Smith & Son ..... 30,093  
 Howell J. Williams ..... 23,360 J. Casmichael ..... 19,954  
 J. Clement ..... 53,469 J. C. Sutton ..... 3,664  
 Balsam ..... 51,543 W. Shepherd ..... 11,490  
 Rudd & Son ..... 21,068 J. Chessum & Son ..... 10,573

**LONDON.—**For new receiving-rooms, &c., Latimer-road, W. for Messrs. Eastman & Son, Messrs. Northcott, Son, & Neighbour, surveyors:—  
 Mowlem & Co. .... £5,065 H. Wall & Co. .... £4,444  
 J. Greenwood ..... 53,469 J. Whitehead & Co. .... 4,073  
 Bywaters & Son ..... 4,498 F. T. Clincham ..... 3,995  
 Godson & Son ..... 4,497

**LONDON.—**For erecting national schools, Warwick-road, Kensington. W. Mr. John Butler, architect:—  
 J. Greenwood ..... £5,071 Chincham ..... £5,041  
 General Builders, Ltd. .... 6,140 G. F. Kent ..... 5,924  
 Spencer, Sants, & Co. .... 6,140 B. E. Nightingale ..... 5,924

**LONDON.—**Accepted for erecting warehouse at back of the T. Lovey House, &c., for Mr. G. Fugeter, architect:—  
 J. W. Hoops ..... £5,380

**LONDON.—**For alterations, additions, and fittings at the "Black Horse" beer-house, Broadway, W. for E. F. de S. Leheup, Mr. Fred. A. Ashton, architect, 179, Monmouth-road, Stratford, E. Quantities by Messrs. A. Estem & Co., Printing, Total:—  
 A. E. Symes ..... £84 ..... £598 ..... £1,368  
 J. W. Hoops ..... 1,579 ..... 1,579 ..... 3,157  
 W. G. Maddison ..... 780 ..... 492 ..... 1,272  
 J. & H. Cocks ..... 778 ..... 408 ..... 1,186  
 C. Sumner ..... 69 ..... 53 ..... 1,240

\* Accepted.

**LONDON DERRY.—**Accepted for the erection of a house, Northland-road, for Miss Scott. Mr. E. J. Toye, architect, Strand, London:—  
 Building ..... Robert Colburn, Strand, Derry ..... £1,840  
 Plumbing ..... James McLean, Llandau James-street, Derry ..... 118

**MANCHESTER.—**For taking down and rebuilding "The Long Vaults" Weston, for the Oakington Brewery Co. Messrs. K. & T. Lower, Messrs. Architects, Linton-chambers, at John Dalton-street, Manchester. Quantities by Mr. H. of Stone, King-street, Manchester:—  
 W. Hoops ..... £5,851 Geo. Macfarlane ..... £5,680  
 F. E. Haynes ..... 8,880 R. Whittle ..... 2,673  
 T. Lower House, 15, St. James-street, Manchester ..... 1,579  
 Burgess & Cah ..... 7,773 Bluckley (accepted) ..... 7,485  
 Wm. Shaw ..... 8,993

**NEWBURY.—**For re-building Sandford Farm, Newbury, for Mr. Alan MacGregor, Mr. Walter J. Ebbetts, architect and surveyor, Savoy House, 15, St. James-street, Manchester:—  
 J. M. Macey & Son ..... £393 Winsler & Co. .... £352  
 J. M. Macey & Son ..... 3,933 J. Warner, Nottingham ..... 2,040  
 C. H. & A. Bywaters & Son ..... 755 Lampell, Smith, & Co. .... 685

**NORFOLK.—**For additional accommodation at the Royal Cambridge Asylum, for the instruction of pauper children:—  
 Walter Holt & Sons, Crofton ..... £2,540

**PLYMOUTH.—**For the erection of chimney, &c., at Prince Rock Mr. Jas. Paton, Borough Engineer, Plymouth:—  
 Finca ..... £2,897 to 0 Goldford, Massey, & Locking Jones, 15, St. James-street, Manchester, Nottingham:—  
 Skanes ..... 5,674 14 7 ham ..... £5,372 to 0  
 Dart & Pollard? ..... 5,374      \* Accepted.

Withdrawn.

**PORTSEA.**—For the erection of St. Stephen's Church, Portsea, Portsmouth. Plans by Mr. Reginald A. Crowley, architect, 22, High-street, Croydon. Quantities by Messrs. E. M. Whittaker and Charles G. Maynard, architects, London, E.C. 4.

	Amount included	Amount
Learmouth .....	£9,130 0	21 2 1/2
W. Potter .....	0 0	1 1/2
Clark & Sons .....	0 0	1 1/2
Stephens, Baston & Co., Ltd. ....	0 0	1 1/2
J. M. Perkins .....	0 0	1 1/2
J. Crookrell .....	0 0	1 1/2
Light & Co. ....	425 0	1 1/2
T. P. Hall .....	5,586 12	1 1/2

**PORT TALBOT (South Wales).**—For conversion of school house at Port Talbot for the School Board. Mr. F. B. Smith, architect, 22, High-street, Croydon. Quantities by Messrs. E. M. Whittaker and Charles G. Maynard, architects, London, E.C. 4.

Evans Thomas .....	£195 0 0	0 0
Morgan Cox .....	218 0 0	0 0
Johns Jones .....	389 0 0	0 0
Jno. Davis .....	207 10 0	0 0

**SILBY (York).**—For the erection of punter-house, meter-house, drainage works, &c., for the Urban District Council. Mr. W. J. Mori, Engineer, Council's Offices, Silby.

H. Goodall .....	£1,250 0 0	0 0
Johns Jones .....	389 0 0	0 0
H. Foster .....	1,014 5 0	0 0

**SOUTHAMPTON.**—For conversion of No. 3, Upper Main, place, into business premises, for Messrs. Tyrell & Green. Mr. William Burroughs, architect, Southampton.

A. Wright & Son .....	£2,950 0 0	0 0
Johns Jones .....	389 0 0	0 0
H. Foster .....	1,014 5 0	0 0

**SOUTHAMPTON.**—For the erection of a house at Butts Ash, near Southampton. Mr. C. W. Wray, Messrs. J. & S. Dunder, architects, Southampton.

A. Warden .....	£500 0 0	0 0
E. F. Barrow .....	254 0 0	0 0
Hood & Rabbitts .....	791 0 0	0 0

**SURBITON.**—Accepted for erecting a detached residence. Mr. R. Lano Pearce, architect.

Geo. Burrage, Sutton .....	£1,175 0 0	0 0
----------------------------	------------	-----

**SURBITON.**—For the erection and completion of certain alterations and additions to "The Crescent Lodge, Clarendon-road, for Mr. P. C. Shaw. Mr. R. Lano Pearce, architect.

Geo. Burrage, Sutton .....	£1,175 0 0	0 0
----------------------------	------------	-----

**SURBITON.**—Accepted for the erection and completion of a detached residence in Clarendon-road. Mr. R. Lano Pearce, architect.

Geo. Burrage, Sutton .....	£1,175 0 0	0 0
----------------------------	------------	-----

**THAMES DITTON.**—For the erection and completion of two shops and premises, with residences over, in Thorblith-road, for Mr. P. C. Shaw. Mr. R. Lano Pearce, architect.

Geo. Burrage, Sutton .....	£1,175 0 0	0 0
----------------------------	------------	-----

**WATFORD.**—For various sanitary works at the London Orphan Asylum, Watford. Mr. Walter J. Ebbetts, architect and surveyor, Watford.

J. Bolding & Sons .....	£1,175 0 0	0 0
C. Jennings & Co. ....	499 10 0	0 0

**WATFORD.**—For various sanitary works at the London Orphan Asylum, Watford. Mr. Walter J. Ebbetts, architect and surveyor, Watford.

J. Bolding & Sons .....	£1,175 0 0	0 0
C. Jennings & Co. ....	499 10 0	0 0

**WATFORD.**—For various sanitary works at the London Orphan Asylum, Watford. Mr. Walter J. Ebbetts, architect and surveyor, Watford.

J. Bolding & Sons .....	£1,175 0 0	0 0
C. Jennings & Co. ....	499 10 0	0 0

**WATFORD.**—For various sanitary works at the London Orphan Asylum, Watford. Mr. Walter J. Ebbetts, architect and surveyor, Watford.

J. Bolding & Sons .....	£1,175 0 0	0 0
C. Jennings & Co. ....	499 10 0	0 0

**WATFORD.**—For various sanitary works at the London Orphan Asylum, Watford. Mr. Walter J. Ebbetts, architect and surveyor, Watford.

J. Bolding & Sons .....	£1,175 0 0	0 0
C. Jennings & Co. ....	499 10 0	0 0

**WATFORD.**—For various sanitary works at the London Orphan Asylum, Watford. Mr. Walter J. Ebbetts, architect and surveyor, Watford.

J. Bolding & Sons .....	£1,175 0 0	0 0
C. Jennings & Co. ....	499 10 0	0 0

**WESTON-SUPER-MARE.**—Accepted for the erection of a residence at the corner of Eastcombe and Bristol roads. Mr. H. Dare Bryan, architect, Bristol.

H. Rogers .....	£451 15 0	0 0
-----------------	-----------	-----

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

**WINDSOR.**—For the erection of new Douglas Stores, Thames, &c., Windsor, for Mr. Mrs. Newell Reid & Co. Mr. John (Geo. Care), architect, Windsor.

E. Bampfylde .....	£4,732 0 0	0 0
A. H. Revell .....	4,332 18 0	0 0
H. Burford .....	4,332 18 0	0 0

## THE BATH STONE FIRMS, Ltd.

FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

## HAM HILL STONE.

**DOULTING STONE.**  
The Ham Hill and Douling Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son  
The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-Ham,  
Somerset.  
London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava  
Asphalte Company (Mr. H. Glenn), Office, 42,  
Poultry, E.C. 4.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-rooms,  
granaries, tun-rooms, and terraces. Asphalte  
Contractors to the Forth Bridge Co. [ADVT.]

## SPRAGUE & CO'S, Ltd.,

INK-PHOTO PROCESS,  
4 & 5, East Harding-street,  
Fetter-Lane, E.C. [ADVT.]

## QUANTITIES, &c., LITHOGRAPHED

accurately and with despatch.  
**METCHIM & SON**, 10, PRINCE STREET,  
ST. GEORGE ST. WESTMINSTER  
"QUANTITY SURVEYORS' DIARY AND TABLES."  
For 1898, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

**SLATES, SLABWORK,**  
Enamelled Slate,  
Marble,  
Permanent Green Slates.

WORKS:  
Bow, London, E. and  
Aberllefenny, North Wales.  
BRANCH HOUSE:  
37, Victoria-street, Bristol.

## PILKINGTON & CO

(ESTABLISHED 1838),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.  
Telephone No., 2751 Avenue

Registered Trade Mark,

## Polonceau Asphalte.

PATENT ASPHALTE and FELT ROOFING,  
ACID-RESISTING ASPHALTE.

WHITE SILICA PAVING  
SEYSSSEL ASPHALTE.

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and TIMBER MERCHANT,  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
HATTON GARDEN, and 29, BAY STREET,  
FABRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
Telephone, No. 274 Holborn. Tele. Address "SNEWIN, London."

# BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

## DIRECTORS.

**CHARLES CREMER, Esq.,** Faversham, Kent, Brick Manufacturer.  
**E. L. CURTIS, Esq.,** 120, London-wall, E.C., Brick Manufacturer.  
**GEO. H. DEAN, Esq., J.P.,** of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.  
**E. W. GOODENOUGH, Esq.,** 27, Walbrook, E.C., Brick Manufacturer.  
**A. J. KNIGHT, Esq.,** Rainham, Kent, Brick Manufacturer.  
**RY. PACKHAM, Esq.,** of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.  
**A. RUTHER, Esq.,** of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
**J. WILLSON, Esq., J.P.,** of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
**GEO. E. WRAGGE, Esq.,** of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—**E. J. COLEBY, Esq.,** 148, Gresham House, Old Broad-street, E.C.



# The Builder.

VOL. LXXV. NO. 2822.

JULY 9, 1893.

## ILLUSTRATIONS.

### Glasgow Architecture:—

The Town Hall.—(Mr. W. Young) .....	Double-Page Ink-Photo.
The Athenaeum.—(Mr. J. J. Burnet) .....	Two Single-Page Ink-Photos.
Barony Church (Mr. J. J. Burnet); Camp Hill Church (Mr. W. Leiper); St. Vincent U.P. Church (the late A. Thomson) .....	
Wellington-road U.P. Church (Mr. T. L. Watson); Free College Church (the late C. H. Wilson); Queen's Park .....	Double-Page Ink-Photo.
Established Church (Messrs. Campbell Douglas & Sellars) .....	
The University (the late Sir G. Scott); Western Infirmary (Mr. John Burnet); National Bank of Scotland; Central Station (Dr. Rowand Anderson) .....	Double-Page Ink-Photo.
Chambers, St. Vincent-street (Messrs. F. Burnet & Boston); Carpet Factory (Mr. W. Leiper); Citizen Buildings (Mr. T. L. Watson); Saw Buildings (Mr. W. Leiper) .....	Double-Page Ink-Photo.

### Blocks in Text.

Glasgow Architecture:—		Portions of the Old University Reused on the Park Entrance Lodge	Page 26
New Club .....	Page 23	Business Premises .....	" 27
The Herald Building .....	" 23	The School Board of Glasgow .....	" 28
The Corn Exchange .....	" 24	The Infirmary .....	" 28
Bank of Scotland Buildings .....	" 25	Street Front .....	" 29
Bargemen's Institute .....	" 26	Scottish Temperance League Building .....	" 30
Cast-iron Mantel modelled by Alfred Stevens .....			Page 33

## CONTENTS.

The Architecture of Our Large Provincial Towns.—XVI.—Glasgow .....	21	Archæological Societies .....	34	General Building News .....	40
Notes .....	0	The Association of Municipal and County Engineers .....	34	Stained Glass and Decoration .....	42
The Guildhall Loan Exhibition .....	37	The London County Council .....	37	Foreign .....	" 42
The Architectural Association Summer Visits: Haver Castle .....	38	Lancashire and Cheshire Building Trades Employers' Federation .....	38	Miscellaneous .....	" 42
Cast-iron Mantel modelled by Alfred Stevens .....	33	Applications under the 1893 London Building Act .....	38	Capital and Labour .....	43
Magazines and Reviews .....	33	New Directories .....	39	Legal .....	43
Illustrations of Glasgow Architecture .....	34	Books Received .....	39	Meetings .....	44
Competitions .....	34	Tudor-street Ancient Light Case .....	39	Recent Patents .....	44
Architectural Societies .....	34	Libraries of the Middle Ages .....	39	Some Recent Sales of Property .....	44
		The Students' Column: Sound, Light, and Heat.—II. ....	39	Prices Current of Materials .....	47

### The Architecture of Our Large Provincial Towns.

XVI.—GLASGOW.



GLASGOW is often spoken of as a "dirty manufacturing town," with the implication that it has little or no architectural interest, and that its generally unattractive appearance is not noticeably mitigated by the energetic enterprise of what every one acknowledges to be a model municipal government. It is, however, far from so impressing an unprejudiced visitor, who finds, in the large central and west central districts, broad straight streets, laid out with great regularity, and bordered by handsome buildings, in the production of which neither architectural skill nor money have been lacking. Even some of those districts that are given up to factories and workmen's dwellings have the substantial air conferred by the use of stone, and are less dismally depressing than their brick-built counterparts in the English Midlands.

Nor is Glasgow, though its past is altogether overshadowed by its present, without a history. The figures of Roman conquerors and even of St. Mungo or Kentigern are, no doubt, indistinct enough; but the existence, before the end of the twelfth century, of the cathedral, and of charters for the holding of a market and an annual fair, and the establishment of the University in the fifteenth century, are historic facts which show that the place was a considerable one even in those days. The site of the mediæval town is, indeed, one that must have early invited settlement; easily defensible, close to an important river, and overlooking the gentle slope, with its southern aspect, now covered by the business quarter of the city, but

then valuable for cultivation, it must have at once recommended itself to the first comers capable of appreciating its advantages. It was, however, only after the establishment of the university that the place began to be of real importance, and not until nearly the end of the seventeenth century that the tide of commercial prosperity began to rise which has lifted it into the position of second city in the Empire. It now covers, with its suburbs, an area of nearly six miles long, and four and a half miles wide, and contains within that area about three-quarters of a million of inhabitants. The architecture of the modern city may be described in general terms as traditionally scholarly, cold and severe, founded exclusively on the Classic and Italian Renaissance styles, and entirely uninfluenced in the main by either Gothic work or the remains of the beautiful Scottish Renaissance. The severity of aspect is doubtless enhanced by the coldness of the grey stone with which, until recently, all important buildings were faced; and it is also, no doubt, a recognition of this fact which has made an apparently newly-discovered red sandstone so popular that it is being used almost to the exclusion of the other at the present time. In many cases one could wish that such a change of material were the only, or at any rate the chief, one; but here, as elsewhere in the Kingdom, there is an attempt on the part of architects to escape in all directions as far as possible from the leading strings of tradition; and though, no doubt, those few who have something to say succeed in being very interesting, it is among the refined classicism of such a city as this that the weakness of the average designer, when he attempts to run alone, becomes most distressingly apparent.

In considering the architecture of Glasgow in detail, the new municipal buildings, erected by Mr. William Young, as the result of a competition in which more than a hundred architects took part, naturally come first.

This enormous edifice, which stands at the east end of George-square, in the north-east part of the central district, occupies the whole of one of the almost square blocks into which this part of the city is cut up. It is of four stories, built round a small courtyard, and each of its four façades measures, roughly speaking, about 240 ft. in length. At each corner there is a well-proportioned pavilion surmounted by a dome, and behind the broad western pediment rises a substantial looking tower, a clever paraphrase of that of the U.P. church in St. Vincent-street, which makes a satisfactory centre to a simple and dignified group. The architectural arrangement of the stories is also well managed, the two lower ones containing the offices being included in a high basement that gives prominence to the principal floor on which the council and committee rooms, the reception rooms, banqueting hall, and so on, are situated. Of the four fronts, that to the north seems to us the most satisfactory, no doubt because the internal arrangements permitted the use in this part of one large order, instead of the two superimposed smaller ones that are carried round the rest. The architectural details are those of the Italian Renaissance, but it does not seem to us that either they or some of the incidental sculpture are quite worthy of the occasion; they are no doubt respectable, but they are certainly not interesting, nor do they everywhere show much appreciation of the smaller refinements of which such detail is capable. Internally the more public parts are extremely richly finished. The two spacious main staircases, from the top story to the bottom, are of marble, with balustrades, arcades, and panelled wall linings of marble and alabaster, and vaults and ceilings of modelled plaster richly gilded. For richness of effect there is probably nothing to surpass them in the country. The floors of the public corridors, halls, and landings are laid with ceramic mosaic, which is beautiful enough, though it lacks the softness of marble;



and the domes and vaults of the entrance-hall are decorated with the same material in a manner imitative of Roman painted ceiling decoration. The great banquetting hall still lacks the paintings with which, no doubt, it is intended to ornament the panels on the walls, and, though the ceiling and architectural details are richly gilded, has a somewhat bare appearance. The council, committee, and reception rooms, on the other hand, are finished with panelling, very richly moulded and carved in various fancy woods, and have an eminently luxurious aspect. There are a few good paintings in one of the reception rooms, but mostly such things have still to come.

Facing the municipal buildings on the north is the Inland Revenue Office, and flanking it on the south the General Post Office, both of them respectable examples of the Italian Renaissance style, the latter having in its upper stories a certain breadth and dignity. The block on the west side of the square is in a similar style and rather more interesting; the tower at its north end especially is good in proportion and outline and an effective feature. It is time that the hotels facing the square on the north were rebuilt; their shabby appearance is not creditable. The centre of the open space is occupied by a statue of Sir Walter Scott "masted" on a Doric column that stands on a very effectively designed pedestal; and there are no less than eleven other statues in the square, the best of which is perhaps that of Lord Clyde. Passing to the east along George-street, one notes, at the first turning on the left, St. Paul's parish church, a small building with a Grecian-Ionic portico and well-proportioned turret, and a few paces further on Anderson's College, a neat little two-storied edifice in the Adam style, almost opposite to which is a Gothic church with a many-pinnacled spire, of the architecture of which the less said the better. Beyond this is the unfinished red sandstone front of a tobacco factory, on which it is difficult at present to express an opinion. It will be nearly all glass, but the designer has attempted to give it architectural character by means of flanking turrets and rather elongated and superfluous-looking three-quarter columns, planted on the face of the piers. At the corner of Montrose and Cochran streets are the City Sanitary Offices, designed in what may be called the fashionable rusticated style, which by its effective depth and richness seems to justify the choice of those who support the fashion; and further west, at the corner of John-street, a curious church with a range of heavy Roman Ionic columns forming the mullions of what may be called one vast window. Then, after passing George-square and the handsome and refined Bank of Scotland (by Mr. Rockhead), in St. Vincent-place, one comes to the new red stone lofty front of the *Glasgow* newspaper offices, a fairly effective, rather ornate, Dutch Renaissance design, by Mr. T. L. Watson, with two steep-stepped gables surmounting a story of deeply recessed elliptical arches and flanked by an octagonal turret; and, next to it, the older and rather more sober front of the Clydesdale Bank (the late James Sellars), with its super-imposed orders and arched and rusticated basement. Opposite to the latter is the more recent front of the Scottish Amicable Assurance Society; and, at the corner of Buchanan-street, the Western Club, both of them, as regards architecture, in the Italian Renaissance style and of respectable quality. It is, however, impossible to merely enumerate all such buildings; for the better quarters are full of them. One must pass on along St. Vincent-street to the corner of Hope-street, where the lofty premises called Norwich Union Chambers (Mr. Hutchison) arrest attention by the newness of their red stone fronts, their steep gables, and their circular angle tower; in the exception of the gables, which are much broken up, they are, however, very plain and not especially remarkable in any way.



New Club. (Messrs. Campbell Douglas & Sellars.)

Almost opposite to them is a branch of the Commercial Bank of Scotland, with a new front of three bays, flanked by narrow pilaster strips and surmounted by a rather curly gable. After this there is nothing very noticeable in St. Vincent-street before the celebrated U.P. church, designed by the late Alexander Thomson (Greek Thomson), is reached. It is a curious, heavy-looking structure, very effectively placed at the angle of two streets on the side of a steep hill. Externally the building appears to consist of a cella with hexastyle Ionic porticos at the ends and low flat-roofed aisles, all mounted on a lofty podium, on an extension of which stands also the tower, a plain square banded stalk with a very marked entasis, surmounted by a lantern which may be described as consisting of four doorways and a sort of drawn-out, egg-shaped, dome. The details throughout are scholarly, and it is evident that a vast amount of thought and skill must have been expended in welding them into a satisfactory whole, for the result certainly is satisfactory in its way.

Returning by the prosperous-looking West George-street and the New Club (illustrated above) towards the centre of the city, one comes, at the corner of Renfield-street, to a group of several large new blocks of offices, the best of which, architecturally, is that occupied by the "Sun" Insurance Company, and designed by Mr. Wm. Leiper.

It is a six-story building with several gables, or rather large dormers, on the fronts, and a large, slightly corbelled-out, octagonal angle tower with a dome covered with green slates and surmounted by a small lantern; the details are in the François I. style, and used with knowledge and discretion. Then, in St. George's-place is the not very handsome St. George's church (Mr. Stark), the tower of which is, however, picturesque in outline and a conspicuous feature, terminating the view along the street in both directions. In the rear of the church is the Faculty Hall, an excellent piece of work by the late C. H. Wilson; and to the south of it, at the corner of Buchanan-street, there is a block of offices in the heavy early French Gothic style, at one time popular, and a fair example of its class, one of the very few in Glasgow. The two-story front of the Athenaeum building, which faces the church on the north (by Mr. J. J. Burnet, A.R.S.A.) is broad and simple—beautifully grouped and proportioned, and altogether the most pleasing design yet noticed, but less pleasing than the other and very different front to the same building, by the same architect, in Buchanan-street (see lithograph illustrations); a high, narrow-gabled façade of five stories flanked by a tower. While in the former case the lines are mainly horizontal, in this they are altogether vertical, and it will be extremely interesting to see how the two





The Herald Buildings. (Messrs. Honeyman & Keppie.)

striking and ambitious red structure rears its stepped gable above the adjacent roofs; it consists of a series of three-storied bay windows set in arched recesses under a balustrade which projects over them in ogee curves: the head of the arch facing the main street is flanked by a pair of female figures under projecting canopies, and this front would probably strike one very favourably but for the ugly and heavy hood over the window in the gable. The offices of the *Herald* newspaper opposite, designed by the late Jas. Sellars, are worthy of note, if only to contrast their correct classicism and wealth of detail with the curious, plain, but interesting building just erected for the same paper in Mitchell-street by Messrs. Honeyman & Keppie, in the very latest, entirely original, style, with big simple mouldings, long flat curves, and a heavy angle tower surmounted by an ogee roof so flat that hardly more than the edge is visible from anywhere in the immediate neighbourhood. There are one or two other new buildings in Buchanan-street, but nothing of note architecturally.

The great mass of the St. Enoch railway station is a Gothic revival effort that one can no longer sympathise with; considered a success in its day, its pointed segmental arches and heavy mock machicolations now seem the acme of ugliness; possibly five-and-twenty years hence the same may be said of the architectural fashions of to-day; but meanwhile one need not fear to praise the delightful little François I. subway station in the square: it is only a doll's house beside its big neighbour, but it is simply charming. The old parish church behind it is a plain building, with a Grecian Ionic portico, and a very well designed, though rather thin, steeple.

The National Bank in Queen-street, by Mr. Gibson, is a little two-storied edifice in the Roman Renaissance style of exceptional merit and thoroughly well studied in every detail. The same may be said of the more important Royal Exchange by the late Mr. Hamilton in the same street, a building partly of two and partly of three stories, but with a single large Corinthian order on three sides, very cleverly treated, and a deep portico with a still larger order and broad pediment in front. The unnecessary turret, good as it is in itself, rather takes away from the dignity of the edifice, but it at least serves to hide from Ingram-street some of the ugly network of telegraph poles and wires that covers the roof. In front of the Exchange is a good equestrian statue of Wellington, and behind it the Ionic portico of the Bank of Scotland, flanked by two well-designed archways which give access to Buchanan-street. On either side, too, of Exchange-square care has been taken to support the main edifice by well-designed and harmonious buildings, in a manner too rarely accomplished or even attempted in this country.

Among many important buildings in Ingram-street, the additions in rear of the General Post-office on one side and the Union Bank on the other are prominent. The former is interesting more from being a not altogether unsuccessful attempt to combine a large area of window with traditional classic details, than for the refinement of the details themselves. On either side of it, on the other hand, are curious little old buildings in the Adam manner, the chief charm of which is their refinement. The Union Bank strikes the eye—rather forcibly than pleasantly—with its polished red granite columns and pilasters; it is, however, a vigorous composition, and its deeply-recessed windows and strong cornice go far to redeem its lack of repose. Next to it is the new Savings Bank building by Mr. Burnet, the banking-room of which, a one-story structure, with a dome and lantern standing rather oddly in front of a four-story block of offices, is a very fine composition in the later Italian Renaissance style, with those broken pediments and curly shields that used to be anathema, and generally deep and

fronts are to be harmoniously connected when the intervening buildings are pulled down to make way for an extension of the Athenæum, as we understand they are destined eventually to be. The only other building to be noted in West George-street is the simple Roman Doric portico of the North British Railway Office.

Lower down Buchanan-street there are, on the left, the Royal Insurance Buildings, and, on the right, the head office of the Commercial Bank of Scotland, new buildings, somewhat alike in the freedom with which their Renaissance details are treated, in their octagonal angle towers, and in the attempt to obtain effect by means of a series of small

openings in the top story; the larger scale of its parts, however, gives to the Bank—a design by Messrs. Mitchell & Wilson—a considerable advantage. It adjoins in Gordon-street the older building of the English and Scottish Law Life Office, an effective example of the more orthodox Florentine Renaissance. The pretty little gabled front of some tea-rooms lower down Buchanan-street was, we believe, designed by Mr. G. Washington Browne; it is charmingly detailed in a very refined manner, and the two-storied oriel over the door is an exceedingly picturesque feature, notwithstanding its ugly shaped pediment. Beyond this, on the other side of the way, a





*The Corn Exchange. (Mr. W. F. McGibbon.)*

strongly-marked features. It is built in a pleasant light brown stone, with a grey granite plinth. We understand that Mr. Frampton executed the incidental sculpture, yet the only things that do not seem quite happy are the crouching figures supporting the pediments; they are almost too much doubled up, and yet too small in scale for the work they appear to be doing. Further on is the new front of the County Buildings, in a similar brown stone, a composition in regulation Classic style, harmonising with the older parts, with the exception that the order is Corinthian instead of Ionic, as at the other end. Next to this is a warehouse, which makes a very poor attempt to be Scottish in style; and at the bottom of Montrose-street a plain, unfinished red stone building, which seems to be designed on much the same lines. Then comes a Gothic revival church, with a square tower facing the end of "Candlerigg," in which and in Albion-street are the two fronts of the City Hall, neither of them very interesting. In Candlerigg also are the markets, which, however, have no architectural pretensions.

Returning, one finds in Glassford-street two fronts worthy of note, that of the old Trades House, a mutilated but still interesting example of the style one knows by the name of the brothers Adam, and the offices of Messrs. Mann & Byars. At the corner of Wilson-street and Virginia-street is the ornate Legal Life Assurance building, and in Virginia-street a good imitation of a Florentine palace in the offices of Messrs. Blair & Co. The block in Miller-street, in which Stirling's Library is situated, is a similar

imitation but simpler, while the large building opposite reminds one of the coarser and richer work of Venice.

Passing to the district west of Buchanan-street, there are in Renfield-street and Union-street several large blocks of shops and offices that one would like to have space to notice, but it must suffice to mention the effective new premises at the corner of Gordon-street, and the curious, heavy, half-Grecian, half-Egyptian building on the east side of Union-street, known as the Egyptian Halls, and designed by the late Alexander Thomson. In Hope-street is the gigantic Central railway-station and hotel designed by Dr. Rowand Anderson. One hesitates a little to classify its style. At the time it was built it might have been called "Queen Anne," but it is more restrained than most of the architecture that was then perpetrated in that Royal lady's name—at any rate, it is thoroughly well adapted to the purpose of the building, which, with its long ranges of windows, looks like what it is, and nothing else; while the steep gables and high dormers save it from too great a monotony. The tower alone does not appear quite a success; it seems to lack the belfry or open stage between the plain stalk and the roof, or, failing that, a much stronger cornice or projecting eaves to throw a shadow. On the other side of Hope-street the new Corn Exchange presents its four stories to the world under the guise of two; by which means its architect, Mr. W. F. McGibbon, has succeeded in producing a far handsomer and better building than he could otherwise have done. It is a simple and unaffected but solid and

satisfactory composition. The "Standard" buildings, and the block opposite the end of Bothwell-street, are rather commonplace, but the little one occupied by the Temperance League is decidedly pretty, notwithstanding the long drawn-out columns that would give a certain shock to the purists; the well-designed gable is, however, very near to being spoiled by the too large window in it. Of the several large new blocks of offices in Bothwell-street, the Mercantile Chambers by Messrs. Jas. Salmon & Son is at least the most singular and original. It is excessively plain, and its few thin and scattered ornaments seem merely to accentuate its severe simplicity. Its most attractive features are the four female figures under the cornels at the level of the second-floor windows, those on the left, representing Prosperity and Prudence, being particularly fine works. Poor Mercury, in his sentry box over the door, seems to have collapsed after the fatigues of some long journey. There is no doubt that the composition as a whole has the merit of daring originality and is not wanting in skill of a kind, but it looks more like the design of a clever academy student than one put forward for execution by a practical architect; and we are not sure that we like its originality much better than the coarse commonplace of some of its neighbours. Only a few paces further on, in the same street, stands the enormous seven-story block containing the offices of the Christian Institute and other kindred societies; a structure in a sort of round-arched Gothic style that would offend by its coarseness far more seriously were it not used with considerable skill in a building which is also very cleverly





*Bank of Scotland Buildings. (Messrs. Campbell Douglas & Sellars.)*

grouped as a whole, and impressive on account of its enormous mass. In the streets just south of Bothwell-street, may be noticed the Free Gaelic Church and the Pillar Hall in Waterloo-street, besides several blocks of offices in Wellington-street, notably the Baltic Chambers in course of erection.

A short walk up Mains-street to the corner of Sauchiehall-street, brings one to the Corporation Art Galleries, an extensive building of no special interest, but containing an excellent collection of pictures, among which most of the great schools, but especially the Dutch and Flemish ones, are well represented. There is also a small collection of sculpture, and the glass cases in the rooms contain some good bronzes, ivories, and other interesting objects. The Congregational Church in Pitt-street is a learned imitation of a Grecian Ionic temple, but not more effective than the cleverly grouped Baptist Church at the opposite corner, notwithstanding the comparative inferiority of detail in the latter; nor than the United Presbyterian Church a little further west, which is a very similar structure. The parish church opposite the last named is a good specimen of modern Decorated Gothic, we believe by Mr. Emmet, and has a very well-proportioned spire; it is altogether a much better piece of architecture than the Free Church at the next corner, which is also Gothic, or would be. A little further south, in Elmbank-street, is the High School, a broad, simple, well-designed building of two stories, with a good cornice, and with four piers carrying statues which flank the middle bays and look much better than one would have expected. Large wings, connected with the main block by screens, have been

added as memorials of the Queen's two Jubilee years. St. Matthew's Free Church in Bath-street is an elaborate, but not very successful, example of modern Gothic. At the corner of Sauchiehall-street, at Charing Cross, are two very pleasing new blocks of shops and chambers, Albany Chambers and Charing Cross Mansion, by Mr. J. J. Burnet. Of the two we like Albany Chambers the better, especially the narrower side, with its two three-storied bay windows under a gable terminating in a well-designed pedimented niche. Both buildings are in the fashionable red stone. A little west of these, opposite the end of North-street, is a pretty little terra-cotta drinking fountain, erected in memory of Sir Charles Cameron.

St. Andrew's Hall in Granville-street is a very striking composition in Classical Greek style by the late Jas. Sellars, the main feature being a large Ionic colonnade raised on a high podium and surmounted by an attic, plain in the middle, but having a caryatide order in the end bays; the main wall is set well back behind the order, which gives a very fine depth and some good shadows. The weakest features are the four groups of sculpture, the figures in which are squat and out of proportion as well as badly posed. St. George's Free Church in Elderslie-street is also a rather striking structure in its way, though far less learned in its details. It is a cruciform building with a shallow dome and good lantern, and the main entrance is by a deeply-recessed portico with a nondescript Ionic order, the entablature of which is surmounted by an arch of the same depth; the same composition, without the recess, is repeated in the other arms of the cross, and a very good general grouping and effect is produced. The Glasgow Eye In-

firmary is a simple building, in Domestic thirteenth-century Gothic, with trefoil-headed windows; and the Trinity Congregational Church is one of the better modern Gothic churches in the town; as is also the church at the top of Claremont-street. The Queen's Rooms, in Clifton-street, is a rectangular building, with a row of high, narrow, semi-circular-headed windows in the lower part, with an effective blank wall and deep frieze carved in bas-relief above them; it was designed by the late C. H. Wilson; the detail is refined and the general effect good, though the sculpture is but moderate. The Italian-looking Wesleyan Church at the bottom of Claremont-street is chiefly noticeable for its campanile-like tower; but the Board school in the same street is a really fine building, of a simple, massive type, very far removed from the typical English Board school. The Kelvingrove United Presbyterian Church, opposite the park gates, is a Gothic Church of a rather French type, with a large rose window over the porch, and a pair of massive-looking flanking turrets; it has an apsidal east end, and is well proportioned and detailed. The Free Church facing the side of the last is a little Grecian building with a good Ionic tetrastyle portico and a refined though rather elongated turret. St. Enoch's Free Church, opposite the new Art Galleries, is noticeable for its tower, which is finished with the four flying buttresses supporting a little turret, which are peculiar to Scotland and a church at Newcastle. It is difficult to form any opinion at present as to what Messrs. Simpson & Allen's Art Galleries are going to be like. Some of the balustrades and pinnacles on the end blocks are set, but none of the roofs are on, and the middle block is far behind



the ends. The details look a little as if they had been originally intended for execution in terra-cotta, and are small in scale, and there is a great deal of block stone left in various places for the carver; we hope that the one main pinnacle at present covered with lead is only an experiment; it looks incongruous and might just as well be stone.

Sir Gilbert Scott's University Buildings look much better close at hand, where the detail can be seen, than at a distance that only shows the general outline: at a distance one only notices the thin and rather top-heavy tower and the ugly masses of the end pavilions; when near, the effective and scholarly mouldings of the deeply-recessed windows, and the carefully-designed niche canopies on the buttresses attract attention—to say nothing of the marvellous traceried spire. Any one can tell now that the spiky angle pinnacles are a mistake, and that the red stone and polished granite shafts in the windows strike an inharmonious note; but though we have learned so much since Scott's day, and though no architect who valued his reputation would now attempt to put up a similar building, we are compelled to acknowledge in it, as in every thing Scott did, the presence of a master's hand. The best piece of composition is, however, the Bute hall between the internal courtyards which, moreover, has, owing to its round angle turrets, the distinction of looking a little Scottish, a merit which is rather rare in Glasgow architecture; perhaps the stepped gables of the residential parts are intended to have the same effect, but they hardly succeed alone. The adjoining Western Infirmary (Messrs. J. Burnet and J. J. Burnet) has, however, stepped gables which, with the help of some characteristic strapwork over the window-heads, succeed better; at any rate the middle block succeeds, in which such window-heads are combined with the characteristic short round turrets on the upper part of the angles. The little joint lodge at the entrances to the University and Infirmary is a pretty little building, and also perhaps aims, though in a rather half-hearted way, at looking Scotch. Anderson's College Medical School, beyond the Infirmary, is unlike the University in that from a distance it invites closer inspection, which is poorly repaid. At the western entrance to the Infirmary, in Church-street, is the new Pathological Institute,\* a truly delightful piece of architecture, as original as any one could wish, without being in the least eccentric. At first sight, its gable end and large lead turret give it, on one side, the aspect of a church, or the chapel of the Institution, but that is no doubt unintentional; the turret has, probably, a very practical use as a ventilator, and the square-headed windows and skylights are evidently not meant to deceive. The one large window in the gable, with its queer deep treatment, the broad wall spaces, and the evidence of thought and design in every detail gives us a pleasure for which we feel deeply grateful to Mr. Burnet, its architect. The Wellington United Presbyterian Church (designed by Mr. T. L. Watson), facing the University grounds on the north, is a very effective Classical structure, with a Roman Corinthian order, a great deal of the effect being due to its situation on a steep incline, which has allowed of its being set upon a high base, with a magnificent arrangement of flights of steps leading up to its deep, pedimented portico; the detail is good and the side walls are well set back to get the shadow behind the great columns—altogether it is a striking building. A little lower down the hill is a charming lodge, built from remains of the old University building, and now forming one entrance to the new University: the entrance arch, with the panel and coat-of-arms and strapwork over it, all the windows, including dormers and some deep, many corbelled balconies seem to be old; perhaps the cornice, with its corded roll, is so also; these details are put

\* Illustrated some years ago in the *Builder*.



Barmen's Institute. (Messrs. Honeyman & Kippie.)



together in a simple, natural way, and with the addition of a round turret on the angle, make a very pretty and characteristic little piece of work. One wishes the two neighbouring Gothic churches were as good as the last few buildings described.

In making from this point an excursion towards the Observatory, the new Belmont

Church is passed, a red stone Gothic edifice of plain but good character, with nave and transepts only. In Huntley-gardens there is the Hillhead parish church, an older, but also good example of nineteenth-century Gothic, of a French type in many of its details, with a large wheel window under an arch in the west front, and large—almost too large—angels in the spandrels over it; there are a pair of plain turrets at the west end with a marked entasis in their spires, and an apsidal east end. The Observatory is a plain one-story building with mullioned windows and four centred arches; the Belhaven U.P. Church, near it—a type of small Gothic church at one time much admired, and, we think, justly—has three tall lancet windows of equal height in the gable, flanked by well-developed buttresses. The Kelvin-side Academy is a plain building, but well grouped, and with a well-designed central block of the Greek temple character, mounted on a high basement. The Botanical Gardens Station of the Caledonian railway (Mr. J. J. Burnet) is a pretty little red brick tiled building with white woodwork and half-timber gables, a strange sight in Glasgow: it has two tall turrets on the roof with gilded onion-shaped domes, is very well grouped and detailed and looks too good architecturally for what it is. The new medical school of Queen Margaret College (by Messrs. Honeyman & Kippie), near here, is a nice little building of quaint and original character. Further east again one comes to a new block of shops, close to Kelvin Bridge, with gables and square dormers and circular ogee topped end turrets—not over elaborated and of good character. The Academy, close by, is a rectangular block of the sober old-fashioned type, quiet and dignified, with an Ionic colonnade on three sides





Business Premises. (Messrs. F. Burnet &amp; Boston.)

recessed between end blocks which are treated with quoins. The church on the other side of the bridge is a rather ambitious early Gothic one, with high thin spire, but of no great merit. The newer and plainer "Woodside" church, at the corner of Montague-street, is, architecturally, a much better one in a round-arched style; and St. Mary's, a little further on, on the other side, by Mr. J. O. Scott is, as might be expected, very good indeed. It consists of a nave and chancel with aisles and transepts, and a tower and spire of very grand proportions. The style is late thirteenth century, with what is called plate tracery in the principal window heads. There is a delicate wrought iron screen in the chancel arch which would bear gilding; it does not show up in an interior that is much darkened by poor stained glass. The new Volunteer Headquarters in Blyths-

wood-gardens is simple and appropriate; the German Church in Woodside-road, an odd little wooden building; and the Church of England church, at the bottom of the Quadrant, a Gothic structure of no particular interest. Neither is the Woodlands United Presbyterian Church, though ambitious and cleverly designed in a heavy, early French style, and possessing a tower and spire of good outline, altogether satisfactory. It is, however, better than the Park Church, which stands on the top of the hill in the fashionable residential quarter that overlooks Kelvingrove Park and the University; the only interesting feature of this church is its square tower, the belfry stage and pinnacles of which are rather picturesque. At the opposite corner to it is the Free Church college, a grandiose Renaissance building, designed by the late C. H. Wilson, with one

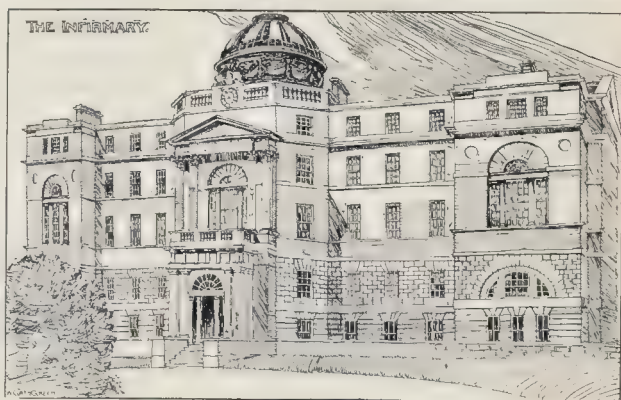
large tower at one end, and two smaller ones flanking a pediment at the other, and looking as if they were intended to be in the middle of a longer block, one wing of which has never been built. The neighbourhood of Garnett Hill, to the east of this, does not contain much of architectural interest before arriving at the Sick Children's Hospital and Dispensary, two very neat little buildings, the chief feature of which is a large end turret with a conical roof and lantern. Near here is the Normal school, a large, plain building with little architectural pretension beyond a clock tower and a symmetrical arrangement. Of the several theatres in the neighbourhood between this and the Queen-street station the only one which makes any show of architecture is the new Empire Theatre in Sauchiehall-street. It is, like most theatres in these days, over elaborated,





but makes a well-balanced group in red stone with some interesting details. The late Gothic church in Renfield-street, close by, may be just noticed, and there are two new blocks of business premises further west in Sauchiehall-street that claim attention, as well as the Art Gallery, by Messrs. J. Burnet and J. J. Burnet, which is a fine composition of the strictly Greek type, and admirably detailed; the sculptured friezes in the wings are effectively placed, and of just the right amount of relief—details that are too often neglected.

The Cathedral is, of course, the chief centre of architectural interest in the north-eastern district; but, with every desire to find in it a worthy representative of the beautiful thirteenth century style, one must confess that externally it is not, as compared with Gothic cathedrals generally, of imposing size or inspiring beauty. With the exception of its spire, which is disproportionately small, and was probably, from its appearance, rebuilt or added in the fifteenth century, the features are plain almost to baldness, and the details, except here and there, coarse almost to ugliness; it is, moreover, black with the smoke of the city. The interior is different, and a beautiful example of the period. The nave is a narrow one and covered with a wooden barrel vault; the clearstory and triforium are treated as a single feature in a very effective manner, and the clustered piers of the nave arcade are all of one plan and size. The aisles are vaulted in stone, but to a large extent this vaulting seems a restoration. Judged by English contemporary work, the mouldings, even more than the general arrangement, are singular, but not ineffective: the caps of the nave piers have odd stringy-looking mouldings that must be regretted, but if the horrible modern stained glass were removed from the windows there would not be much else that one could wish different. The choir, also vaulted in wood, is more conventional in design than the nave, and the work one may suppose of a more experienced man. But the real interest of the building is, as Sir Gilbert Scott pointed out in his lectures, in the vaulting of the crypt, where the mason thoroughly enjoyed himself in solving puzzles of his own setting. It was, no doubt, worth doing, the fun and interest are still obvious, but one may be excused for suggesting that a less maze-like arrangement of piers would have been more beautiful and made the space more useful. The cathedral stands on the

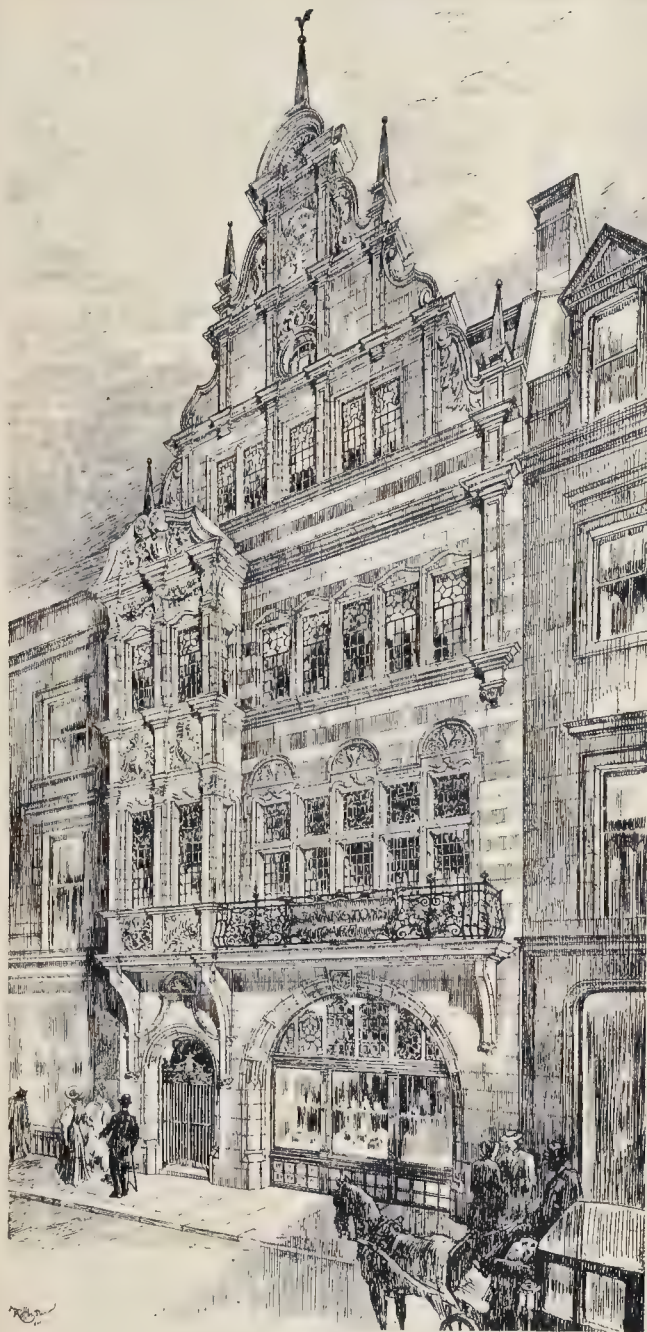


side of a deep valley on the other side of which is the Glasgow Necropolis, which rises in terraces and presents more the appearance of a well-kept foreign than of a British cemetery. Among its many memorials are of course the usual commonplaces, but it also contains a number of worthy monuments, such as one seldom finds out of France or Italy. The Royal Infirmary, opposite the west end of the cathedral, is a good though simple design by Adam, with the characteristic semicircular-headed arch and triple window within it, and a small central dome. Opposite to this again is the Barony Free Church with a broad, saddle-backed tower. The new Barony Church, designed by Mr. J. J. Burnet, is a little further down the hill, but still facing Cathedral-square, the site of the oldest part of Glasgow, long ago cleared away by the Improvement Commissioners. It is a large, simple red-stone building, with lancet windows, and a little sharp turret over the crossing. There is a neat school-house attached and forming part of the group; and just behind the church, in Rotten-row, the Townhead Board School, one of the excellent plain square type that seems to be general for board schools in Glasgow. We give an illustration of one of these Board Schools, an effective and characteristic group

by Messrs. Honeyman and Keppie. On the opposite side of Cathedral-square is a church of the older kind in Renaissance style, and on the south slope of the hill is the prison, which is absolutely plain except for the usual turrets with sham arrow slits on the angles of the external wall.

The old College railway station, which was practically the old Glasgow University building, has entirely disappeared, except for the details built into the lodge noticed above, and the external staircase (also re-erected at the new University), and the High-street has lost its chief object of interest. The two classical buildings flanking the end of College-street are, however, worthy of notice and reminiscent of the better days of this quarter. The new branch office of the British Linen Company's Bank, opposite the station, is also a pretty little piece of architecture. At the bottom of High-street is Glasgow Cross, where there is a curious old tall, thin clock-tower with the four buttress crown; and opposite to it a charming little domed octagonal subway station, designed by Mr. Burnet. A little further west is the tower of the old "Tron" Church, standing out over the footway opposite to a most remarkable block of buildings intended to be in the "Scott





Street Front. (Mr. Washington Browne.)

symmetrical, three-storied block, with a dome in the middle, with which the other roofs rather quarrel, and good depth in its architectural features, at any rate in front; the detail is good, without being very refined or interesting. Near this is a rather startling new wing of a carpet factory, designed by Mr. Wm. Leiper in the Italian Gothic style, and built of gaudy-coloured bricks, with blue glass mosaic in the heads and spandrels of the windows. The style is very cleverly imitated in all its features and details; the colours are harmonious, if rather louder than one is used to; and we have no hesitation in saying that we think the experiment is a decided success, and in such a position, overlooking the chief playground of "the masses," one that was well worth making (see lithograph). Messrs. Doulton's terracotta fountain on the green may also, perhaps, be mentioned; we do not like the figures and groups on it, but the architectural detail is good, and so would the general outline be if the water were allowed to play; but that is a difficulty the designers of our public fountains always seem to have to face—naturally, if the form to be taken by the water is considered in the design; but where the water is absent the fountain cannot be an artistic success. This is one of the things they manage better abroad.

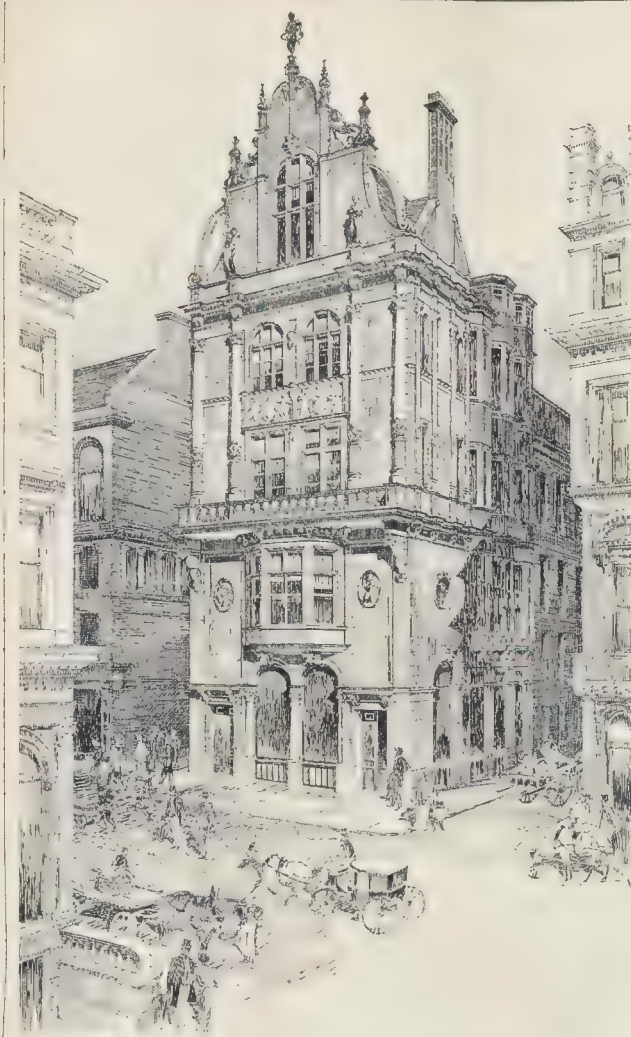
Returning westward one passes the Eye Infirmary, a pretty little building facing the Green, and, at the west end of the latter, the old Court-houses, a large, two-storied, Classical Greek building, with a deep Doric portico of gigantic columns. The Fish Market is a more modern building, the two large gateways of which give it importance. The Roman Catholic cathedral is a not very successful Gothic edifice, with rather exaggerated pinnacles; the Custom House, a little building, with a small Doric order, of little importance; but the Clyde Trust office, by Mr. Burnet, at the bottom of Robertson-street, is a very fine composition. Its chief feature is a pediment supported on two piers, and four three-quarter Corinthian columns, with caps of original and beautiful design, between which are large, mullioned windows. This middle feature is flanked by broad piers, and mounted on a high rusticated basement, on which two models of the prows of ancient ships are the principal ornaments.

There is but little space left in which to deal with the architecture of the "South side," the extension of Glasgow on to the alluvial plain on the other side of the Clyde. But, except quite at the south end, this district is almost purely manufacturing, and taken up by large factories, warehouses, and the factory hands' dwellings. A few of the factories and warehouses make some pretence of being architectural; for instance, the Scottish Co-operative Wholesale Society's huge block in St. James's-street is treated to three towers of varying design, of which the most important one may claim to be good; and the same Society's newer block in Morrison-street is, for a building of the kind, a well-conceived piece of architecture: the end pavilions with their high curved French roofs and coupled columns make imposing masses, and the middle feature, notwithstanding a pediment that is far too steep, and a dome with too high a drum, is not much inferior; the intervening spaces would have been far more effective if the windows had been set further back in the walls. The front of the old premises in rear of these in Crookston-street is, while less pretentious, even better; the two gables with their shallow arched recesses are original and capable. The new offices of the Fairfield Shipbuilding Company, by Messrs. Honeyman & Keppie, are in the extreme west. They make a long, low front of two stories, with a raised centre block and a square raised pavilion towards one end, which looks as if it ought to have been repeated at the other. The middle block is not unlike a lower, broader, and simplified edition of the front of the Clyde Trust offices above described, but the two ship

Baronial" style. The west end of the island containing the subway station is adorned by an equestrian statue of William III. in a toga and laurel wreath, which reminds one of a certain statue in London. St. Andrew's Church in this neighbourhood is a large rectangular building, with an order of Roman Corinthian pilasters on the sides, which become the columns of a portico in front. The architraves of the windows are broken up by

numerous quoins and keystones, which gives a rich effect of light and shade; the style of the church altogether is good, if the thin, poor steeple be left out of account. At the bottom of Low Green-street, in which St. Andrew's is situated, is a little church, also of some interest, probably dating from about the middle of the last century, now looking sadly neglected. Further east there is not much of architectural interest besides the new museum on Glasgow Green, a well-arranged,





Scottish Temperance League Building. (Messrs. J. Salmon & Son.)

prows are placed lower down, and form pedestals for two figures of mechanics flanking the doorway. The new Lorne-street Board School is a pleasing variation on the old type, depth being added to the principal windows by solid little three-quarter columns carrying pediments. Govan Parish Church is a modern grey stone church with lancet windows and good vertical character. Near it, in the Govan-road, there is a prettily-designed little public-house, in Scottish renaissance style, and a little east of this, on the other side, an unfinished lofty block of shops of striking and effective, but rather eccentric, design.

The extreme south, near Queen's Park, is a middle-class residential quarter, with one or two good churches, but space does not allow us to describe them individually. Glasgow is so extensive that it is out of the question to notice everything that is of some architectural interest. The average level of that interest is high, no doubt inspired originally by one or two men of taste and skill who were the first to create any architectural interest at all, and helped by the supply of good stone, the wealth of the community, and their love

for their city. We do not think that in the immediate past the high level was so well maintained, but at present it seems rising again, and if something of dignity is lost not to return, the gain in interest will probably more than compensate for it.\*

#### NOTES.

A RECENT brief Report from the Office of Works on the Houses of Parliament of Parliament frescoes embodies the latest report of Professor Church in regard to the state of the pictures and the last operations on them. Professor Church had previously advised that Maclise's two waterglass paintings should be protected with a preservative solution consisting chiefly of hard paraffin-wax. It was ascertained that very little change had

\* This series of illustrated articles was begun in our issue of September 26, 1896. A list of those towns already dealt with, and particulars of future arrangements, will be found on page xvi.

occurred in the condition of these paintings since they were cleaned in 1894. The surface having been cleaned of superficial dust and dirt by an airblast, the paraffin-wax was applied, dissolved in toluol to which had been added a small quantity of a specially prepared copal varnish free from lead. Professor Church considers that the paintings are improved in appearance by this treatment; at all events that the injurious action of the London atmosphere on the works will be considerably lessened in the future. The five true frescoes which were three years ago cleaned and treated with paraffin-wax have hardly deteriorated at all since that time, but Professor Church recommends that they should be cleaned, and if necessary paraffined, at intervals of three or four years. When the time comes, as it must, when they can be preserved no longer, it is possible that English art will be in a position to substitute for them something better.

Waterloo Station.

It is to be regretted, from the point of view of the public, that the House of Lords Committee has thrown out that part of the Bill of the South-Western Railway Company under which Waterloo Station was to be enlarged. The scheme no doubt has been altered and diminished to some extent since it had gone through the Select Committee of the House of Commons. It was, therefore, opposed by the County Council because the alterations in regard to streets and houses were not sufficiently to the public advantage. But *prima facie* a railway company does not make new stations or enlarge old ones for the benefit of those who reside on the property to be taken, but for the advantage of the travelling public. It is obvious that Waterloo Station must sooner or later be enlarged; this, indeed, is a public necessity, and it is to be hoped that next session a satisfactory scheme for this purpose may become law.

Electrical Nomenclature.

WHILST doubts are often expressed as to the progress now being made in electrical theory, everyone is agreed that during the last year or two electricians have shown marvellous ability in inventing new terms. There are already several technical dictionaries of electrical terms, extending to many hundreds of pages, but they seem to get antiquated every year. During this year many words have been used in papers read before the Institution of Electrical Engineers, which are not to be found in any dictionary. For example, Major Cardew talked about a "negative booster" when referring to a dynamo; and in the last paper of the session, by Professor Carus Wilson, there were many new words, some of them invented by the author, and some of them picked up in the United States. The "heat drop" in a dynamo, apparently, is what electricians educated a year or two ago called the "lost volts," and it has many other names. Sometimes one speaker would talk about "earths" and "short circuits" on an electric system, and the next speaker would refer to them as "grounds" and "crosses." The number of expressions ending in "factor" being introduced will probably do good, by reducing this unlimited license to invent to an absurdity. Dr. Fleming began it by calling the cosine of a certain angle the "power factor," and



something else the "form factor"; then came the "mass factor," the "impedance factor," the "reactance factor," &c.; and, as if this were not enough, Professor Wilson invents the "induction factor" and the "force factor." Every one of these names is quite unnecessary. It seems to us that if half the labour spent in inventing new names for old quantities were devoted to clearing up the difficulties which abound in electrical theory, rapid progress would soon be made, although, of course, electricians would not be so well able to conceal the weakness of their theories from the intelligent public.

The works sent home by the students of the French Academy at Rome have been on view for the last few days at the École des Beaux-Arts at Paris. The works in painting are not very good this year; the "Homère Chantant devant les Bergers" by M. Deschenaud, a fourth-year student, recalls too much the old official classic art which is now irreverently spoken of as the "Style Pompier." In sculpture there is a fine figure by M. Octobre, "Remords;" and a "Muse Exilée," by M. Champell, a first-year student, promises well. The architects, on the whole, have the best of it this year. M. Pille, a first-year student, sends a fine set of drawings of the remains and a restoration of the Temple of the Sun in the Colonna Gardens, and an admirable water-colour of a mosaic found at Tusculum. M. Patouillard, a second-year student, exhibits drawings and restorations of the arch of Septimius Severus, and two charming water-colour sketches from portions of Siena Cathedral. M. Recoura, third-year student, sends a drawing of the circus of Maxentius, actual state, with a finely-treated landscape background of the Alban hills, and shows himself to be at all events a very fine colourist. Lastly, M. Chaussemiche, fourth-year student, sends a fine set of drawings of a restoration of the temple of Jupiter at Terracina, accompanied by some sketches of other sites in the neighbourhood.

The exhibition of students' work at the "Central School of Arts and Crafts," opened a couple of years ago by the London County Council, is a disappointing affair, and, excepting in a few departments, hardly appears to justify the existence of the school. It was opened ostensibly to supply a special want in crafts which technical education had not as yet reached, but from the work produced it seems evident that either the old system of apprenticeship holds good in certain crafts, or that the instruction is not such as is sought for by the craftsmen. In the establishment of an architectural studio, upon which we commented at the time, evidently a mistake has been made; for the whole year's work only two very poor designs are shown, badly drawn, and likely to cause considerable mirth to any architectural students who happen to visit the exhibition. In the modelling room are some average studies in plaster, some being from the nude. Some rather effective designs from woodcuts in colour are shown, giving an idea of good treatment in this somewhat new art. Among other exhibits are designs for posters, some poor and wiry specimens of furniture design, such as tables and chairs, and some designs

for stained glass, which are better. Some executed specimens are also good, especially one from a cartoon by Ford Madox Brown. There are some good specimens of enamelling, which seems to be the most thriving department, although, even in this case, the work is apparently largely that of amateurs. In the division of "stone working for architects" are shown two small panels, but it is difficult to see their educational value. Some examples of bookbinding, cast lead work, and the usual school of art life studies complete the list of exhibits.

THE conversazione at King's College on Wednesday night was well attended and was a

very successful and interesting affair. The purely recreative part of the entertainment included the performance of an excellent band in the hall, during the reception by Dr. and Mrs. Robertson; a short organ recital in the chapel by Professor Vernham; a string band afterwards on the terrace, which was lighted up and used as a promenade, and a concert in the large hall. Besides these attractions, there were, in various rooms, scientific exhibits and short lectures at intervals; and in another room a collection of what were called original drawings by Sir Gilbert Scott, but which we take it are really some of the numerous drawings made by his various pupils to illustrate his Royal Academy lectures, the whole collection of which was presented to King's College by Mr. J. Oldrid Scott, and forms a remarkable and valuable body of illustrative drawings of architecture. The architectural studios and the wood-carving room on the second floor were also open to the visitors. The pottery exhibited in one room by Messrs. R. W. Martin & Brothers, shows very good and original artistic quality.

In our issue of June 25, we gave an illustration, reproduced from Mr. Ernest Law's book, of the riverside view of Hampton Court Palace. The original drawing was made for King Philip of Spain by Antony Van Wyngaerde; it belongs to the Sutherland collection in the Bodleian Library. The Water Gate is also depicted in a plate engraved by Basire, published by the Society of Antiquaries in December, 1804, after a picture that belonged to Sir Joseph Banks. Some other historical particulars may be added in regard to the "Water Gallery," over the water-way. A good many things happened here. Henry VIII.'s Water Gallery had been occupied by Queen Elizabeth when kept a State prisoner by her sister Mary; there occurred the secret interview between Philip and the Princess Elizabeth in May, 1555; and in August, 1559, the clandestine meeting between the Queen and the Earl of Arran, a suitor for her hand; it was afterwards the home, for a while, of King James I.'s daughter, Elizabeth, Queen of Bohemia; and Mr. Law says, it seems it was from the Water Gallery—where is now the terrace balustrade—that Charles I. made his escape in 1648. During the rebuilding of the State apartments Queen Mary II. lived in the Water Gallery, which was richly decorated for her by Wren, most of the carving being executed by Grinling Gibbons. For her china, a then novel taste, cabinets were made by Gerrard Johnson; some of them

may yet be seen in the Palace. There, too, she had her "Gallery of Beauties," since removed into King William III.'s Presence Chamber, for painting which Kneller was knighted; a looking-glass closet, decorated by James Bogdane, the animal painter; a bathing closet, a marble closet, and a dairy. In the adjoining Privy-garden she employed Dr. Plunket in charge of her collection of rare plants and exotics, and there was made the long arbour of wych-elm trees (perhaps "the cradel walk of horn-beame," mentioned by Evelyn), her favourite resort, which is yet known as Queen Mary's bower. In the summer of 1700 William III., in consultation with Wren, Loudoun, and Wise, resolved to re-make the ground between the south front of the palace and the river; the Privy-garden and the Mount-garden were lowered about 9 ft. On September 25 of that year the Office of Works report that the Water Gallery is taken down (as obstructing the view) and its materials used elsewhere, and that the laying-out of a new terrace between the Broad Walk and the four pavilions at the bowling-green is approved by the king. Kip gives an early view of the terrace, 2,300 ft. long, *temp.* Queen Anne. Some other interesting particulars will be found in the appendix to the late Sir Henry Cole's handbook to Hampton Court.

SEVERAL houses on the east side of the street are in course of being pulled down for their rebuilding. One of them—it is now numbered 122—should not be altogether unnoticed, for it was the last home in London of James Boswell, and, it is believed, that Kossuth (who in 1839 was living in Regent's Park-terrace) occupied the house when he came to England in 1850. Boswell settled in London in 1789, five years after Dr. Johnson's death, taking a house in Queen Anne-street West, which he rented at 50*l.* per annum. Losing his wife that same year he took chambers in the Temple, and joined, with no great success, the Home Circuit. He removed thence to the house, then numbered 47, in Great Portland-street, which is cited in a letter written by Mrs. Ogborne, his neighbour there, to J. T. Smith, and preserved in the Murray "Johnson" collection, and which has been identified with the one we mention. Whilst living there he was appointed, July, 1791, foreign correspondent to the Royal Academy, and brought out, on May 16, 1791, the first edition, in two quarto volumes, of his life of Dr. Johnson, and was engaged upon the third edition at the time of his death there on May 19, 1795. The preparation of the third edition was completed by Malone, who had been Boswell's neighbour at No. 58, Queen Anne-street East, since renamed Foley-place, and now Langham-street.

WE do not know that it is in very good taste, so soon after Mr. Gladstone's death, to exhibit a number of sketches of him many of which are caricature, and sometimes rather ill-natured caricature. But there are a certain number among the 150 sketches by Mr. Furniss at the Fine Art Society's rooms which are in a more serious manner, and which strikingly illustrate the late statesman's desperate earnestness of character and the manner in which he threw his whole



soul into a debate. "At Bay" (12), "Pressing Home a Point" (30), "Listening to an Interruption" (42), "A Pause in His Speech" (48), and some others, are really fine, and indicate the greater side of Mr. Gladstone's character. "Walking into the House" (4) is a good portrait sketch.

We quote the following remarks from a recent issue of the *Centralblatt der Bauverwaltung*. *Mulatis mulandis*, the words apply to proceedings that take place in England, in one locality or other, every week. "A beautiful house-front of the last century—the house in the Flachsmarktstrasse, at the corner of the Rechengasse, in Mainz—has come to ruin. The beautiful door-frame, richly ornamented, has been removed in opening out large show-windows, so that the characteristic decoration of the house is destroyed. . . . Is there no means of preserving, in the interests of the public, such a work of art? Had it been a Roman fragment there would have been no lack of protection for it" [in Germany perhaps, not necessarily in England], "but since it is merely a fragment of old Mainz it may go to destruction without a word. It is like the consolation of the pedant who did not care that his father and mother should die, so long as he had photographs of them."

#### THE GUILDHALL LOAN EXHIBITION.

THE regular London exhibitions, so numerous at this time of year, have prevented our hitherto finding space for any special notice of the remarkable loan collection of French pictures at the Guildhall, which however may be said to be the finest collection of pictures, at least in proportion to the number exhibited, at present open in London. Among the modern pictures one is glad to meet again with some exceptionally fine works which have already been seen in London exhibitions, as well as with some others less familiar; while the collection of works of the older school contains examples of some French painters whose works are not often met with.

Meissonier is represented by one of his greatest and most successful battle pictures, the large water-colour of the cavalry charge which was originally exhibited in London under the simple title "1807," forming one in a short series of Napoleonic subjects, but which has now the title "Friedland, 1807." It was for this picture that Meissonier bought a field of standing corn and procured the loan, as one may say, of a troop of dragoons to gallop in it, with the view of studying accurately the effect. With all the vigour of the group of riders in front of the picture it is remarkable, nevertheless, how completely the scene is dominated by the calm impassive figure of Napoleon in the rear, entirely bearing out the artist's professed aim in the work, "to paint Napoleon at the zenith of his glory." Ney was the general director of the movement of which this charge formed a part, and by a dramatic contrast, on the other side of the room is what is perhaps M. Gérôme's most impressive picture, "The Execution of Marshal Ney," exhibited in Gallery II. of the Royal Academy some twenty years ago or more. Both of these pictures are remarkable among the works of their respective painters for an exceptional seriousness of aim and feeling. Meissonier is represented in the exhibition by one or two works of his more usual style, including one of the early microscopic ones, "Causerie"—hardly one of his best; and Gérôme by the admirable historical picture, "Son Eminence Grise," and by his still more remarkable painting of a desert scene with a lion chasing antelopes, the lion in the foreground in the middle of a great bound into the air, with his shadow making a blue blot on the hot sand under him; a picture which we noticed specially at the time of its exhibition in the Salon a few years ago.

Among other works in the large gallery is a typical example of the art of Bastien-Lepage, "The Potato Harvest," one of those large pictures

of plain and unadorned peasant life with which his name is chiefly connected; there is also his smaller and very expressive and piquant portrait of Marie Bashkirtseff. At the top of the room, in the central position, is Rosa Bonheur's monumental picture of "The Lion at Home," flanked by two works each admirable and telling in its way, singularly contrasted in subject—Jules Breton's "First Communion" (a work rather apart from this artist's usual line of subjects) and Detaille's fighting episode, "A Reconnaissance," not one of the most impressive and dramatic of his battle pictures in general effect, but one of the most real in bringing before us an actual incident in street fighting. In the large gallery is also M. Harpignies' beautiful landscape "Solitude" from last year's Salon, which should interest people as a typical example of the finest qualities of contemporary French landscape painting; M. Gérôme's "Cleopatra," as *passée* now as Cleopatra herself must have been at the time; M. Henner's "La Source," an example of this artist at his best; M. Dagnan-Bouveret's "Bretagne au Pardon," which made such a sensation at the Salon of 1880; M. Benjamin-Constant's remarkable Moorish interior entitled "Pastime of a Spanish Kalife," and a small but very fine landscape by M. Jan-Monchablon. In the raised gallery at the end of the room are one or two of M. Tissot's English subjects, painted during his London period, including the exceedingly clever ball-room scene, "Too Early"; also Bouguereau's "Cupid and Psyche," a typical specimen both of the powers and limitations of this accomplished but essentially common-place painter.

The second gallery, on the higher level, contains a good many examples of the seventeenth and eighteenth century French painters; one or two charming works by Le Nain, several Watteaus, not of the very best, but interesting examples of his work; several by Lancret, one or two fairly characteristic examples of Fragonard, and several of Boucher. On the end wall are some examples of works of the earlier nineteenth century artists, of which the most interesting are two very broad free landscapes by Jacque, remarkably modern in style for their date, and a fine forest scene by Rousseau. Georges Michel's "La Bouillie," hung over the last-named work, must not be taken as a favourable example of Michel's work, and seems to have been repainted in parts, the trees more especially; if not, it is unlike any example of Michel that we have previously seen.

We confess, however, that we turn with more interest to the pictures of the later and contemporary artists in the upper galleries. Among these is Corot's noble landscape "Le Lac," several beautiful smaller works by Daubigny, an exceptionally fine landscape by Diaz, "L'Orage," two or three of the same painter's small figure groups, so remarkable for their poetry of colour, and a very fine cattle picture of Troyon's, "Going to Market," painted with a force and solidity that gives the idea of the pigments having been loaded on with the fingers rather than with a brush. In the third gallery are two exceptionally fine little works by M. Gérôme and M. Fantin-Latour, hung as pendants one on either side of the door, and which may stand as very characteristic examples of the prose and the poetry, respectively, of figure-painting. That by Gérôme, "Bain Maure," is in his most finished style of Oriental interiors; a tiled bath-room where a white nude woman is seated by the edge of a bath, while a mulatto woman with an orange-coloured head-dress prepares to throw water over her from a brass vessel. The colour and the execution of every detail are perfect; even the collection of garments hung over the screen is quite a study. M. Fantin-Latour's picture, "The Bath" is the very reverse of all this. Not a detail is fully made out. It represents a half-nude figure, under the shade of trees which form a dark background to the figure, gathering up her drapery, which falls in harmonious lines from her arm; the water and the landscape are just sufficiently made out to keep their place in the composition; but the whole is not the least like a representation of actual fact; it is a kind of ideal poem in form and colour, the kind of picture, like his "Le Lever" in this year's Salon, the charm of which is quite undefinable in words; in an intellectual sense it is one of the finest things in the whole collection, though, one may fear, little understood of the people.

Among the other works in this part of the

gallery, besides those previously mentioned, are one or two charming little *genre* paintings by Mme. Henriette Brown; a little work by Rosa Bonheur, "The Return to the Mill," an admirable specimen of M. Chevreillard's sarcastic studies of French priests—"He Dines at the Châteaueux"; a very clever small interior by M. Chavet, "The Reader," which might almost pass for a Meissonier; Cabanel's picture, "The Florentine Poet," so well known by engravings; Courbet's "L'Immensité," a very fine sky and a bad sea; an admirable half-length portrait by M. Carolus-Duran, "The Poet with the Mandoline"; a very clever painting by M. Degas of the ballet scene from "Robert le Diable," and M. Puvion de Chavannes' sensational picture of "The Beheading of John the Baptist," painted a long time ago, and, as one may say, before he became Puvion de Chavannes.

The exhibition is evidently attracting a great number of visitors, and should be very useful in giving to the general public an idea of the quality and style of some of the best modern French artists. The catalogue, which is very well got up, gives a short sketch of the life and work of the principal artists represented, with the dates of their birth, and the date of the picture, where known.

#### THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

##### HEVER CASTLE.

HEVER CASTLE, in Kent, was visited on the 2nd inst. by twenty-two members of the Architectural Association, including among the number the President, Mr. G. H. Fellowes-Prynne. Permission to visit this most interesting and beautiful building was kindly granted by the owner, Mr. Waldo; and as the castle is at present unoccupied the visitors were allowed to examine it very thoroughly.

The place presents a peculiar mixture of the peaceful domestic house and the defensive feudal castle. It was built as it now stands, mostly about the middle of the fifteenth century, and being surrounded within about 10 ft. by a wide moat it has had no excrescences built on to it subsequently. The east side is occupied by a castellated gateway, which is at present approached across the moat by a bridge of brick and stone.

A stout oaken portcullis and door both outside and inside, and a groove for a third portcullis midway between the other two, together with holes in the stone vault of the gateway for mollen lead, pitch, and other missiles to be cast through, make a pretty complete series of defences at this point.

The house is built round a small court-yard, the dwelling rooms and offices forming the three sides not occupied by the more martial looking gate house.

The courtyard is about 40 ft. square, and paved with bricks laid in a herring-bone pattern. The outer walls are of local stone with a warm coloured soft Sussex sandstone for the wrought portions. The walls of the domestic portion of the courtyard are of timber and plaster. There are quadrant shaped "sham timbers" on the plaster, evidently old work, and showing where a more modern coat of plaster has peeled off. Horizontal real oak moulded strings run round the walls at intervals and these are protected with lead weatherings. The lead is in lengths of about 4 ft. and is about  $\frac{1}{2}$  of an inch thick and lapped at the junctions. The plaster and timber walls are carried up and form a parapet. The old windows in this portion have moulded oak mullions and transoms.

The house as at present existing is in a somewhat dilapidated condition, though we hear that it is shortly to be made thoroughly habitable. Successive occupiers of the place have put up partitions here and ceilings there, and these somewhat mar the proper dignity of the interior. The banqueting hall, which is on the west side, has been turned into a kitchen, and shorn of part of its height; the old fireplace is filled up with a modern close iron range, and an ugly stair casing is thrust into the N.E. corner of the room.

The main axis of the building runs east and west, and passes through the entrance gateway and court, the passage between the banqueting hall and the old kitchens, and across a second bridge over the moat at the back or west side. The passage between the hall and kitchens is screened off from the hall in the typical manner with an oak screen, which is enriched with



fluted Jacobean pilasters. The kitchens on the north have two large fire arches, reminding one very much of those at Hampton Court. One of these arches is bricked up. In the other is lying a very fine cast-iron fire-back, with the Royal arms upon it and the initials C.R.

Occupying the ground floor of the north wing are larders and store places, and in one of these lies the old wrought-iron roasting crane and the spit and clockwork jack for turning it, also the ponderous weight which actuated the jack. It is to be hoped this may be restored to its place in the old kitchen, even if it cannot be made fit for use. With the exception of this and a long Elizabethan "joined" table in the hall, there is nothing in the house in the way of furniture.

From the banqueting-hall there was originally a spiral stair leading to the first floor rooms and to the long gallery under the west roof. The steps have been removed, and the space used as closets opening off the main rooms. There are four or five staircases now existing in the house, one being of about the beginning of the eighteenth century. Some of the older stairs have steps cut out of solid triangular pieces of oak, but they are laid on bearers, and not erected as stone stairs are now done, one step supporting that above it.

The upper chambers are for the greater part completely panelled in oak, the framing having the usual fine mouldings found in Jacobean work. One chamber on the north side has a massively constructed oak ceiling, the beams being moulded and mason-jointed at the mortises. There is also on this side a little closet overlooking the moat, with elaborately carved pilasters to the panelling, or one should say "pilaster," as all except one have been taken out.

Probably the most interesting feature of the house is the gallery under the roof of the west side. This is about 90 ft. long by 15 ft. wide, and has a four-light transomed window at each end looking north and south. There is a fireplace in a recess about the middle, and an oriel on the west side at the south end. Out of this oriel (the window of which has been blocked up) opens the spiral staircase before mentioned. The long gallery is completely panelled up to the slopes of the ceiling with Jacobean oak panelling, having fluted Ionic pilasters at intervals of about 10 ft. The caps of these are delicately carved but, unfortunately, several are missing. There is a trap-door in the floor at the north end of the room, communicating with a secret chamber or dungeon. There is some fine stained glass in a bedroom window on the first floor, looking into the courtyard, consisting of coats-of-arms. Worth notice, too, are some very pretty wrought-iron door handles, bolts, locks, and hinges, of the same period as the panelling.

The guard-room and a room above it over the gate have been panelled in recent times in deal, and the work painted to imitate oak, with the usual disastrous results.

There is a second and outer moat, now dry, surrounding the inner moat, and with a broad interval between the two, which would make a beautiful site for a formal garden, especially if both moats were full of water. The house is now too closely hemmed in by trees, but with its weather-stained and creeper-covered walls, and the chinks of the walls full of fumitory in full bloom, it makes a most beautiful and romantic picture. There is also an interesting stable building, partly coeval with the house, and a bowling green, which at present is not "trim."

The visitors derived great pleasure from seeing this delightful old place, and the thanks of the Association are heartily due to the owner for his kind permission to view it. The party took leave of the castle hoping some day to be able to revisit it, and to find its beauty enhanced and its interest increased by the judicious restoration which it is to be fervently hoped it may receive.

After leaving the Castle the church was visited, and there are to be seen several interesting and one very fine sixteenth century brass. The modern yellow oak pews and some other new works in the church are a sad blot on an otherwise interesting building.

W. B. H.

PLYMOUTH CITADEL BARRACKS.—In the notice of the drawings of this building in our last week's article on "Architecture at the Royal Academy," the architect's name was inadvertently given as Mr. Kitson, it should have been "Mr. Kittell."



Cast-iron Mantel modelled by Alfred Stevens. (The property of the Coalbrookdale Co.)

#### CAST-IRON MANTEL MODELLED BY ALFRED STEVENS.

THE mantelpiece and grate here shown were designed by Alfred Stevens for the Coalbrookdale Company, and a cast from the work is in their exhibit at the Royal Aquarium. The alto-relief decoration round the opening was modelled by Stevens's own hand; it shows his characteristic freedom and vigour of detail, and is an illustration also of the great sculptor's practical perception as to execution of the work, for though the relief is very bold and has at first sight the effect of undercutting, it is all modelled so that it could be drawn out of the mould as it stands.

#### MAGAZINES AND REVIEWS.

The *Art Journal* contains a very exaggerated article on Rodin, the sculptor, by Mr. Charles Quentin, who can see nothing but perfection in all Rodin's work, including the figure of Balzac, which we are now told to regard not as a powerful but rather preposterous sketch, but as one of the great works of the age. Form in a work of art (in sculpture, too, of all the arts) is to count for nothing, inspiration is everything. A great many of us could be sculptors at that rate. The most valuable article in the number is one by M. Eugene Muntz on "An Italian Realist of the Fifteenth Century," namely, Pisanello of Verona.

The *Magazine of Art* contains an interesting article on M. Guérin's School of Art at Paris. The article on the Salon is illustrated by a full-page plate of Mme. Demont-Breton's beautiful "Dans l'eau bleue," which should be looked at by those who have not been able to see the original picture.

The *Studio* (June 15) includes among its numerous illustrations some studies by Sir E. Burne-Jones. Among the illustrations of decorative work the examples of Copenhagen porcelain are fine and interesting. An article on the three Vernets, the French family of painters, with reproductions of some of Carle Vernet's sketches, should also be noticed.

The *Artist* is called a "Burne-Jones Memorial Number," though the deceased painter and his works in fact only occupy a small portion of its pages. The article shows a far too blind adulation of Burne-Jones's art, but that is to be in the fashion at present. The articles on "Rural Crafts" (apropos of the "Home Arts and Industries Association") and on "The Craft of the Silversmith," dealing especially with the work of Mr. Gilbert Marks, are both of interest, but the designs of the latter show that to "go straight to nature" and "to discard all the conventions which have gathered around metal

work," is apt to lead to work which is unbalanced and deficient in the quality of style, though no doubt style may in the end be developed out of this.

The *Architectural Review* (Boston), in its last issue contains an article by Elizabeth W. Champney on "The Château Gardens of Le Nôtre," an artist who had opportunities such as no landscape gardener has ever had since. The principal illustration is one of The Baron Hirsch Trade School, New York, which reminds one of a French Lycée. The small drawings of a hunting stable, by Messrs. Havell and Shephard, have a somewhat more indigenous flavour, and we like them the better on that account.

The *Engineering Magazine* contains an article on ornamental wrought-iron, with sketches of ancient work and some examples of modern American work, which however has no special quality distinguishing it from European work. Among the other articles in the number are one on "Sewage Disposal" and one on "Applications of Electro-Chemistry."

In the *Antiquary* Sir Stephen Glynne has an interesting article on the Church of Barton-on-Humber, one of the series under the title of "Church Notes," and Mr. Geo. Bailey contributes the second of a series on "Some Ancient Wall Paintings," dealing with those of the church of Burton-Latimer.

The *Nineteenth Century* contains an article on "The Salons" by Mr. Claude Phillips, much of the criticism in which seems to be prompted by a desire to be little most of the things that other people admire, but we are glad to find that he does not bolster up Rodin's absurd so-called statue of Balzac.

The *Century* contains an article on "Modern Dutch Painters," with illustrations of their works; one on "Wilhelm II. as Art Patron," in which we are not surprised to read that the German Emperor's efforts to encourage art "smack too much of personal tastes and one-man power"; and a short and discriminating article on Romney, to accompany two engravings from his works by Mr. Timothy Cole.

The *National Review* contains an article by Mr. H. Heathcote Statham on "Street Music," mainly in relation to the preposterous tyranny of the organ-grinder under which we are allowed to groan in London. In the course of the article it is shown that no capital in the world tolerates this nuisance as we do, and that the argument that it is a form of music for the people (by which the County Council seem to have been bitten) is utterly wrong headed, since tunes mechanically ground out can have no effect but to vulgarise popular taste and blunt the popular ear.

The *Pall Mall Magazine* contains an illus-



trated article on "Castle Bromwich"; the article on "The Evolution of Comfort in Railway Travelling" is concluded, and a new series on "The Story of the Ship" that is, the evolution of the ship, is commenced by Mr. Clark Russell.

We have received also the *Gentleman's Magazine*, the *Genealogical Magazine*, the *English Illustrated*, the *Quarry*, and *Knowledge*, all good numbers, but not containing anything suggesting special comment.

## Illustrations.

### ILLUSTRATIONS OF GLASGOW ARCHITECTURE.

THE illustrations this week are all of Glasgow architecture, and are all referred to in the leading article of this issue.

They comprise exterior and two interior views of the Town Hall, by Mr. W. Young; the front and side elevations of the Glasgow Athenaeum, by Mr. J. J. Burnet; a group of churches,—St. Vincent-street U.P. Church (the late A. Thomson), the Barony Church (Mr. J. J. Burnet), the Free College Church (the late C. H. Wilson), Camp Hill Church (Mr. Leiper), Wellington-road U.P. Church (Mr. T. L. Watson), and Queen's Park Established Church (Messrs. Campell Douglas & Sellars); a distant view of the University (the late Sir Gilbert Scott); the Western Infirmary (Mr. John Burnet); the National Bank of Scotland; the Central Station (Dr. Rowand Anderson); Premises in St. Vincent-street (Messrs. F. Burnet & Boston); Carpet Factory (Mr. Leiper); *Citizens Building* (Mr. T. L. Watson); and *Sun Buildings* (Mr. Leiper).

### COMPETITIONS.

SCHOOL, GREENTLAND, HALIFAX.—At the last monthly meeting of the Eiland and Greentland School Board, the Sites and Building Committee reported that they had decided in reference to the proposed new infants' school at Eiland, that the architect who received the first premium should be asked to carry out the work, unless two-thirds of the members of the Board decided that such a course was undesirable. As regards the plans which were forwarded for competition, the committee decided that the first premium of 10*l.* should be awarded to plans marked No. 2, and the second premium of 5*l.* to plans marked No. 1. It was explained that the successful plans had been sent in by Mr. Herbert W. Booth, Halifax, and the winners of the second premium were Messrs. Richard Horsfall & Son, Halifax.

### ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—On the 2nd inst. the members of this Association had an excursion to Durham. At three o'clock the members, to the number of nearly thirty, assembled at Durham railway station, and from thence proceeded to the new County Buildings in Old Elvet, where they were met by Mr. H. Barnes, of the firm of Messrs. Barnes & Coates, Sunderland, the architects for the new buildings, who conducted them over the same. From the County Buildings the company proceeded to the newly restored Chapter House, where Mr. C. Hodgson Fowler, M.A., F.S.A., the Cathedral architect, acted as guide to the party. At the conclusion of the visit to the Chapter House, St. Oswald's and St. Margaret's Churches were also visited, and subsequently the company were entertained to tea by Mr. and Mrs. Hodgson Fowler.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—The first outing of the Cardiff, South Wales, and Monmouthshire Architects' Society has just been held, when the members journeyed to Bath, where they were met by Mr. David, one of the firm of the Bathstone Quarries Company, and conducted over the principal quarries of the company. Then they were entertained at luncheon, and subsequently driven in breaks through the quarry properties. Major Davies afterwards took the party over the Roman baths. The Abbey was next visited. At luncheon Mr. David presided, and gave the toast of "The Cardiff, South Wales, and Monmouthshire Architects' Society," to which Mr. C. B.

Fowler, the President, and Mr. Caple, the hon. secretary, responded.

BRADFORD SOCIETY OF ARCHITECTS AND SURVEYORS.—The summer excursion of this Society took place on the 28th ult. to Harrogate, Pateley Bridge, and Ramskill. The party made an inspection of the new Harrogate Baths, after which there was luncheon at the North-Eastern Hotel in that town. At noon the journey was continued to Pateley Bridge, where waggons were taken to Ramskill. On the way the works of the Bradford Corporation at Gouthwaite Reservoir were viewed, and on return to Pateley Bridge dinner was provided at the King's Arms Hotel. The chair was occupied by the President (Mr. P. D. Fairbank). The toast of "The Guests" was submitted by the Chairman, and spoken to by Mr. Charles Gott, Mr. T. H. Healey, Mr. C. H. Hargreaves, Mr. W. J. Morley, and Mr. James Young (secretary), and it was replied to by Alderman Holdsworth (Chairman of the Bradford Waterworks Committee) and Mr. James Watson (Waterworks Engineer).

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The annual meeting of the Dundee Institute of Architecture, Science, and Art was held in the Y.M.C.A. Rooms on the 30th ult. Mr. Leslie Ower presided. The annual report of the Council, which was read by Mr. J. J. Henderson, the Secretary, stated that the members numbered 46. The Council sympathetically noticed the death of Provost Orchar, who had always been a warm friend to the Institute. The Associates numbered 99, being a decrease of 24. Of the 24 lady Associates elected in 1891 only 6 remained. There were 10 honorary members, which was the same number as before. The negotiations with the master builders over the rules of measurement were brought, as was thought, to a satisfactory conclusion by the publication of the compiled rules on January 1 last. Unfortunately the Slaters' Association had seen fit to repudiate the arrangement come to in the matter of allowances. The slaters were now proceeding with a system of boycotting, which, while it might inflict some little inconvenience on individual architects, would undoubtedly in the long run recoil on the heads of the slaters themselves. Recently a request was made by the Master Builders' Association to have an item inserted in schedules to cover compensation to workmen under the new Act; but the Council of the Institute ascertained that all the other Architectural Societies in Scotland were against such an item, and they declined to accede to the request. The report was adopted. The following office-bearers were elected: President, Mr. T. M. Cappon; Vice-President, Mr. Thomas Hutton; members of Council, Messrs. R. Blackadder, G. A. Harris, J. W. Mackison, and David Dickie; Secretary and Treasurer, Mr. J. J. Henderson; auditors, Messrs. J. P. Bruce and George Jamieson.

### ARCHÆOLOGICAL SOCIETIES.

HELLENIC SOCIETY.—At the annual meeting of this Society on Monday Mr. Reinach read a paper suggesting a new nomenclature and meaning for the Venus of Milo, viz.: that the figure really represents Amphitrite, and not Aphrodite. The argument is based mainly on a consideration of a statue of Poseidon discovered at Melos in 1877, which is said to have a great resemblance in style and technique to the "Venus" of the Louvre, and it is argued that the two may have been a pair. Some weight is no doubt added to the conjecture by the consideration, which has probably suggested itself to many persons before now, that the very dignified and regal pose of the Louvre statue is hardly in keeping with the idea of a statue of Venus.

SOUTH AFRICAN INDUSTRIAL AND ART EXHIBITION.—An Industrial and Art Exhibition is to be opened at Grahamstown, South Africa, on December 15, to close on January 21, 1899. The exhibits are to be classified under five main groups—Raw Materials, Manufactures, Machinery, Natural History and Science, and Fine Arts. The latter group will include paintings and drawings, etchings, engravings, architectural drawings, photographs, sculpture, art metal work, wood carving, art needlework, and china. The machinery section is expected, however, to be one of the principal features of the exhibition. Messrs. Savage & Sons, Blomfield House, London Wall, have been appointed forwarding agents in London. Inquiries and other communications are to be addressed to the South African and Transvaal Advertising Co., Effingham House, Arundel-street, Strand.

### THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS:

#### ANNUAL MEETING: EDINBURGH.

The annual meeting of the Association of Municipal and County Engineers was opened in Edinburgh on Thursday, June 30. Mr. Lewis Angell, West Ham, Senior Past President, occupied the chair in the absence of Sir Alexander Binnie, and amongst those present were Messrs. O. Claude Robson, Willemsen, President-elect, J. P. Barber, Islington; W. N. Blair, St. Pancras; Scorgie, Rotherhithe; Col. Jones, Carshalton; W. H. Harpur, Cardiff; J. Lobley, Hanley; Yabbicom, Bristol; A. E. Collins, Norwich; J. Parker, Hereford; Cockrill, Yarmouth; A. Creer, York; Stead, Harrogate; W. H. Savage, West Ham; McBrair, Lincoln; A. D. Greatorex, West Bromwich; J. S. Pickering, Nuneaton; B. Ton, Burnley; A. Thomas, Bucks; E. P. Holey, Nottingham; Campbell, Canterbury; J. J. amon, Southampton, and many others.

Prior to the commencement of the Conference the members were received in the Council Chamber by the Lord Provost and other members of the Corporation, Mr. Cooper, Burgh Engineer, having introduced the members of the Association.

The Lord Provost, on behalf of the Corporation and citizens of Edinburgh, bade the Association welcome to the city. It was extremely appropriate, he thought, that they should have chosen Edinburgh as the centre of their annual visitation, because at the present time they had completed or were engaged on very important engineering works.

Mr. Lewis Angell, in acknowledgment, expressed their sense of the courteous and cordial reception accorded to the Association.

The members then returned to the Royal Hotel, where the proceedings of the annual meeting were immediately entered upon under the presidency of Mr. Lewis Angell.

Mr. T. Cole, Secretary, read the annual report of the Council, which stated that during the year the progress of the Association had been satisfactorily maintained. Since the last annual meeting they had added seventy-two new members, and the number of the roll was now ten honorary members, 732 associates, and ninety-two graduates—a total of 834. The Council placed on record with deep regret the death of Sir Robert Rawlinson, K.C.B., who had been an honorary member of the Association since its formation, and who always showed a deep sympathy with and an keen interest in its work. The accompanying balance-sheet showed the Association to be in a highly satisfactory position, the credit balance standing at 255*l.*, and the invested capital at 750*l.* The premiums for papers had been awarded, the first of books, value 10*l.*, to Mr. S. S. Platt, of Rochdale, and the second, of 5*l.*, to Mr. Blackshaw, of Stafford.

The report was formally adopted, and the premium of books presented to Mr. Platt. Mr. Blackshaw was not present.

On the proposition of Mr. J. Lemon, Southampton, the number of examiners was increased to twelve. He explained that the number of candidates for the Association's examination had so increased as to make this step necessary.

Mr. Claude Robson, of Willemsen, was then introduced to the meeting as the President for the ensuing year, and took the Presidential chair.

Mr. Lewis Angell then proposed a vote of thanks to the retiring President, Sir Alexander Binnie, for his services during the year. Sir Alexander Binnie, he said, was the first Municipal Engineer of the world, and it had done honour to the Association to have such a President.

Mr. J. Lobley, Hanley, seconded the vote of thanks, which was accorded with acclamation.

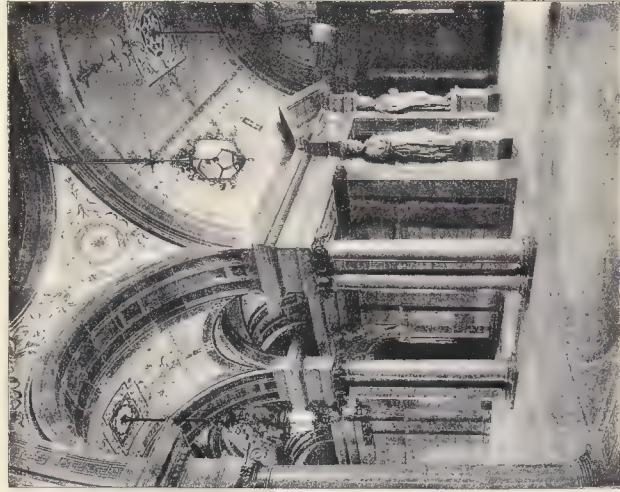
#### President's Address.

The President then delivered his inaugural address. He thanked the members for the high honour that he had received at their hands, and promised that it would be his earnest endeavour to enhance the interests of the Association to the utmost of his power and ability, and steadily to maintain the high reputation it had gained in the past. Reviewing the various duties of the Municipal Engineer and Surveyor he said that some idea of their magnitude might be obtained from the fact that since 1871 the Local authorities had incurred, upon the strength of their borrowing powers, an indebtedness of over 150,000,000*l.* for sanitary works and other improvements. This vast sum was in addition to and quite independent of the annual cost of works defrayed

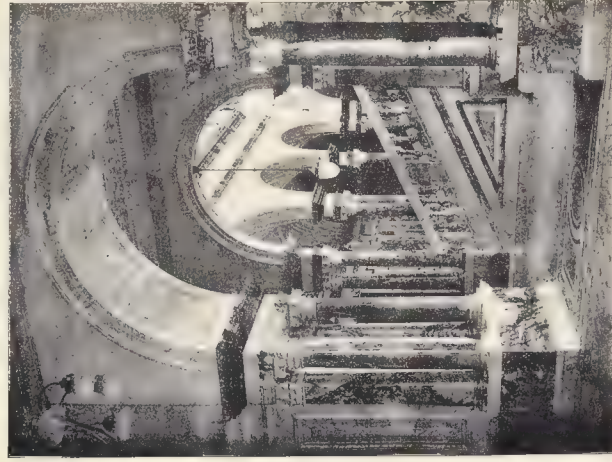




EXTERIOR VIEW.



THE LOBBY.



VIEW FROM LOBBY OF COUNCIL HALL.







BARONY CHURCH.—(MR. J. J. BURNET.)



ST. VINCENT U. P. CHURCH.—(THE LATE A. THOMSON.)



FREE COLLEGE CHURCH.—(THE LATE C. H. WILSON.)



CAMP HILL CHURCH.—(MR. W. LEIPER.)



WELLINGTON ROAD U. P. CHURCH.—(MR. T. L. WATSON.)



QUEEN'S PARK ESTABLISHED CHURCH.—(MESSRS. CAMPBELL, DOUGLAS & SELLARS.)

PHOTOGRAPHED BY J. & A. S. EASTMAN & CO. STREET PHOTOGRAPHY, NEW YORK







THE UNIVERSITY.—(THE LATE SIR G. SCOTT.)



WESTERN INFIRMARY. —MR. JOHN BURNET.



NATIONAL BANK OF SCOTLAND

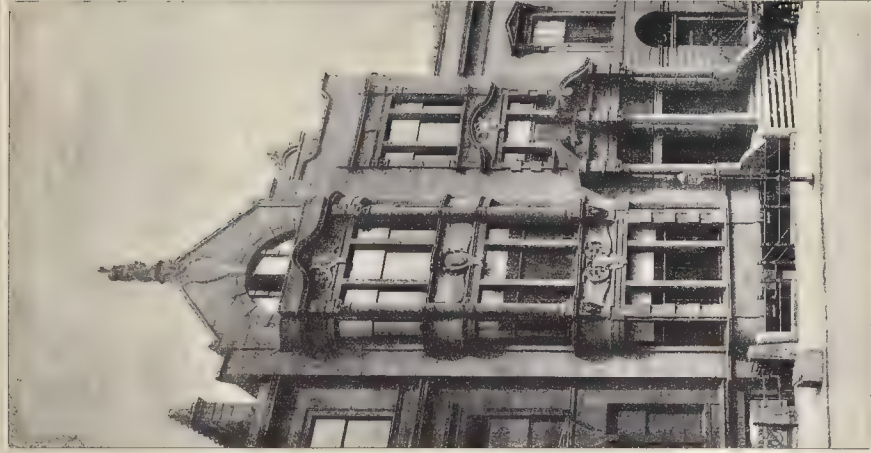


CENTRAL STATION. —MR. HOWARD ANDERSON.

OUR PHOTOGRAPHY: E. & J. G. L. EAST LONDON STREET PHOTOGRAPHY, LONDON E.C. 1



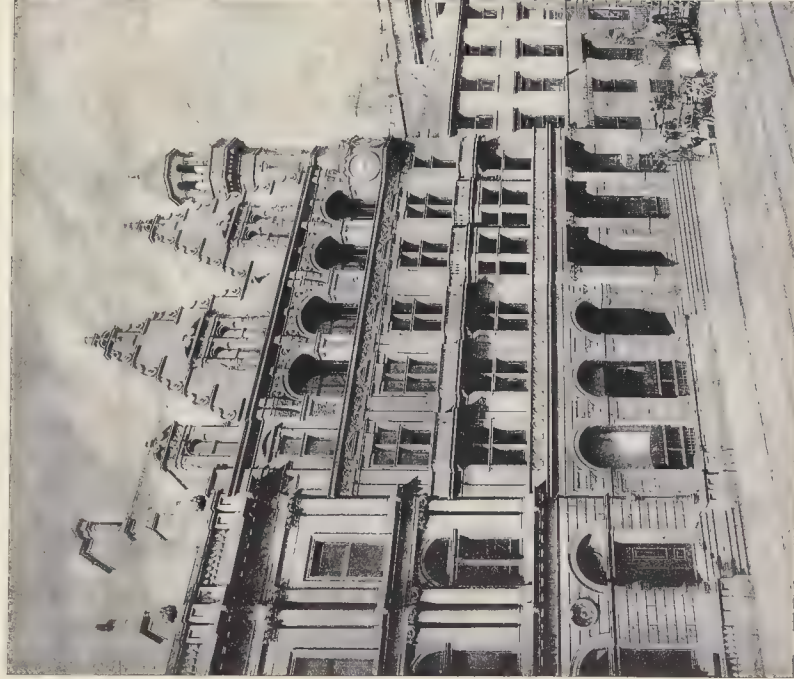




CHAMBERS, ST VINCENT STREET (MESSRS. F. BURNETT & BOSTON)



CARPET FACTORY (MR. W. J. PIPER)



CITY OF GLASGOW BUILDING (MR. J. L. WATSON)

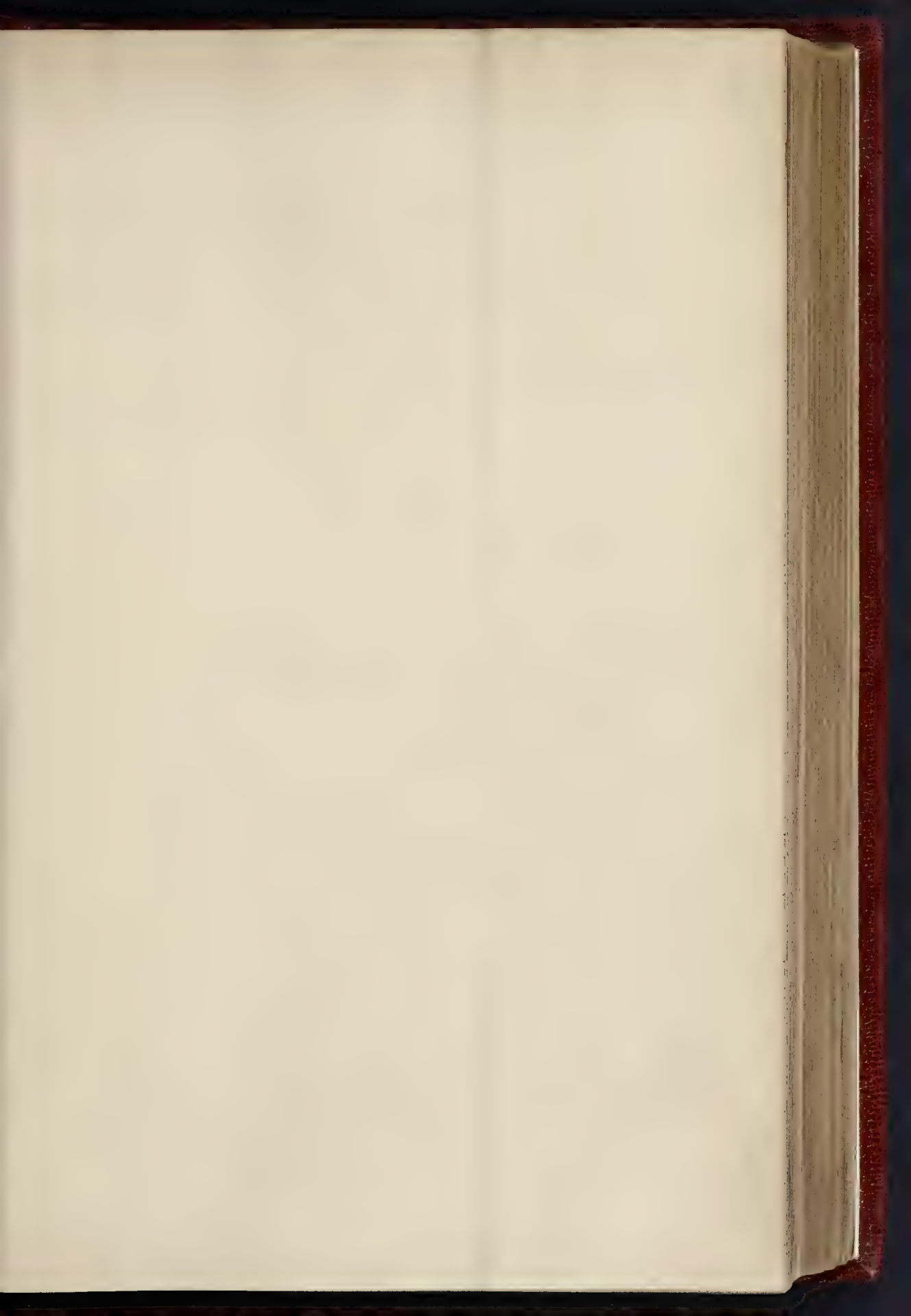


SUN BUILDINGS (MR. W. J. PIPER)

PHOTOGRAPHED BY J. L. WATSON, MR. W. J. PIPER, AND J. L. WATSON











from current expenditure. The progress of sanitation since the constitution of the Local Government Board might also be fairly gauged by the fact that the amount of the loans to Sanitary Authorities sanctioned by the Local Government Board in 1871 was only 267,000l., whilst in 1896 the amount was upwards of 5,500,000l. The nature of the work for which the Municipal Engineer was responsible was varied, comprising road-making and road-maintenance, with concurrent bridge and viaduct work, tramways, sea and river walls, designs of sewerage and water systems, treatment of sewage, public lighting, erection of isolation hospitals, public offices, free libraries, mortuaries, markets, and other buildings incidental to municipal administration, the laying-out of public parks and pleasure grounds, fire brigade control, and supervision of new buildings. In addition, the Municipal Engineer must advise on all Parliamentary promotions affecting his district, and have a fairly intimate knowledge of the various Acts now relating to Public Health. Upon the competency, energy, and zeal displayed by the officials discharging these duties the comfort, convenience, and health of the community largely depended, and the responsibility thus accepted was well known by themselves to be no light one. It was, nevertheless, he believed, one that was taken up with enthusiasm by all of them. They felt that they were members of a grand profession, which tended to the benefit of their fellow man, and he was glad to believe that this ever-present desire of the Municipal Engineer to further improvement in sanitary and kindred sciences was each year becoming more recognised and more appreciated by those whom they served.

Amongst questions of interest, that which had taken priority during the past year, and had been most discussed, was the now familiar subject of the purification of sewage by biological means, as exemplified by the septic tank system, Col. Ducat's filter, and others. This very recent discovery of the valuable assistance rendered by the micro-organisms in tank and filter must be deemed the more extraordinary if it were remembered that the much-condemned cesspools of olden days, with filter tank attached, evidently were adaptable, if they did not contain these natural media, for the breaking down and after oxidation of organic matter in the sewage to be treated, but presumably the generation and, if he might so say, the intelligent nursing of these minute organisms pent within the walls of tanks or filters was not then understood, and it was only quite recently that this system of Nature had been adapted to the hygienic laws. The absence of sludge and the accompanying difficulty of its disposal in the neighbourhood of large towns was especially an important element in the system, and would in itself greatly tend to economise the expenditure upon sewage treatment. Should the promise given in several of the experimental works prove as successful with a varying flow and every description of sewage, or in the more comprehensive scheme for Exeter, as recently sanctioned by the Local Government Board, it would, indeed, be a long stride towards the solution of that difficult problem of the efficient treatment of sewage under all conditions. Especially would it be a boon to those towns discharging into rivers with a small catchment area, and where land treatment was impossible by reason of great price or unsuitability of soil. With suitable land available, however, and at a moderate cost, it was probable that the rotation of Nature as illustrated by the land treatment, from earth to plants, plants to animals, with return from animals to earth again, would in many places retain its early pre-eminence, and the economy of nature thereby be maintained. The whole subject was now doubtless in a somewhat experimental stage, but would in all probability receive the earnest attention of the Royal Commission just formed for the consideration of the treatment of sewage, and whose report was awaited with so much interest and anxiety by municipal engineers. At the enquiry much valuable evidence would be received upon this important question, but with all submission it appeared that beyond this some assistance might be rendered to the Commission if experimental works were provided in the near neighbourhood of the Metropolis, where the several systems of biological treatment could be parcelled out, and, so to speak, practically investigated and tested for a certain period of time, under exactly similar circumstances, as to character of sewage, extent of flow, climatic conditions, and other situations of identity. With careful and intelligent daily supervision, investigation and systematic analyses, much valuable testimony might be gained for presentation to the Commission. The cost of the construction of the necessary works need be but small, and should not stand in the way of what he believed would eventuate in most useful results.

The necessity for more careful consideration in the system to be adopted for the treatment of sewage was becoming each year intensified by the rapid increase of population, by the addition of legislation relating to river pollution, and the more drastic supervision given by the river authorities with regard to sources of pollution.

Foremost still amongst the difficulties of sanitary administration was the ever-troublesome question of the ventilation of sewers. Numerous patents had been hatched, the combustion or disinfection of the gases, but hitherto with no material

result. Like many other patents experiments upon a small scale were eminently satisfactory, which failed from various causes when applied to a comprehensive system extended over a large district. In many towns the open grids had been augmented by the fixture of upcast iron shafts attached to houses and elsewhere, by which all odours offensive to the olfactory nerves were removed far above their sensitive action. The method adopted was a simple and inexpensive one, and although the efficacy of the shafts was by no means universally agreed upon, his own experience of the system, he must admit, had been most satisfactory. The complaints formerly made by residents had practically ceased in those districts where a perfect system had been available, and the life of the engineer had consequently been a more agreeable one during the summer months than was formerly the case.

The action of these shafts was doubtless largely affected by climatic influences, a greater current being registered during strong winds, but after a series of anemometrical readings for twelve months he had found in no single instance a downward current apparent, whilst the upward current had averaged 30 cubic feet per minute, and had upon many days during the summer months, when the utility of the shafts was most required, amounted to 70 or 80 cubic feet. With a current of this rapidity much more success had been achieved in clearing the sewers of foul gases than would have been possible with the open grids. The necessity for these shafts as vents for the gases generated in the main sewers of a town would not, however, be so apparent were all the minor tributaries of a system of main sewerage laid with the same care as the public sewers under the control of the Local Authority. The main cause of the odours in sewers, so much complained of, was the fermentation from faulty house drains, where the flushing administered by the occupiers was not sufficient to cleanse the drain and the intercepting syphon from deposit. A systematic and efficient system of flushing to the house drains where necessary was therefore an important factor in dealing with the ventilation of sewers, as by this work the possibility of the generation of foul gases was minimised by the sewers receiving a flow free from putrefaction. The flushing of the sewer itself was at times useless, as the maldorous contributions of the house drains were left untouched, and the sewer itself might have been perfectly free from deposit prior to the application of flushing.

It was with bated breath that he dared to suggest the abolition of the syphons attached to the house drains, those miniature cesspools through whose putrefying media all drains must now discharge. Whilst at times they were useless for the purpose for which they were fixed, he was confident that at all times they were the source of emanations from the house drains and the sewers. On the other hand, without them what a multiplication to the area of ventilation would be afforded by the thousands of upcast shafts attached to the rear of the houses, while at the same time the atmospheric dilution of the sewer gases would be materially increased.

Dealing next with the condition of the highways, Mr. Robson considered that the improvement effected during the past twenty years was due in a great measure to the higher standard of excellence demanded by the authorities, and the ubiquitous cyclist. The introduction of light railways was an important question, closely affecting the suburbs of the large towns, where they might be introduced without the statutory consent of the road authority, and without any provision as to rate of speed, protection of public roads, restoration and maintenance of same, purchase of undertaking by Local Authority, and many other covenants now required by the Acts relating to the construction of tramways. The supervision of new buildings was possibly one of the most important of the duties of the Municipal Engineer in securing stability of buildings, and in endeavouring to maintain health and ward off disease in the homes of the people. With reference to the provision against fire he considered that some additions were required in the present by-laws, as generally adopted throughout the country, in order that better provision should be made for fire-proof walls and floors in flats or buildings of the tenement class now being so generally built in large towns. In the metropolis powers already existed, but except in private Acts there was no authority that he was aware of outside the metropolis that could enforce this necessary provision. To render the by-laws absolutely satisfactory fireproof floors or horizontal party-walls should be rendered compulsory. This was a matter that might be reasonably represented to the proper authorities by the Association. Upon the sanitary aspect as relating to the supervision of new buildings too much attention could not be paid to the efficient construction of the drainage and the provision of requisite space around the dwellings in order that a free circulation of air might be obtained. Dealing with municipal electric lighting, the President remarked that the advantages in many ways of electricity over any other form of artificial light must be generally admitted, and that the financial success of most undertakings by Municipal Authorities seemed to be assured after the second or third year of working. It was therefore to be anticipated that in the future this system would, like many other municipal promotions, become a relief to the burden of rating, and that the

price would compare favourably with that of any other description of lighting.

Mr. C. Jones, Ealing, in proposing a vote of thanks to the President for his address, said it had been rarely indeed that they had had an address so thoroughly utilitarian in its character.

Mr. J. P. Barber, Islington, who seconded, remarked that Mr. Robson had been one of the most valuable men the Association had ever possessed for his quiet, unassuming work.

The vote of thanks was unanimously accorded, and briefly acknowledged by the President.

#### Tarred Macadam Roads.

Mr. A. H. Campbell, City Surveyor of Canterbury, then read a paper on "The Use of Tarred Macadam in the Construction of Roadways in Urban Districts, and Comparative Considerations." There was, he said, no improved form of macadam which was so coming to the front and demanding that attention which its merits unquestionably deserved as that now going by the name of tarred macadam. It was a composition of any of the stones, gravel, or clinkers commonly used in the making of macadam roads with a mixture of tar. It was a smooth and noiseless road, non-absorbent, cleanly in itself, and easily kept clean; and its first cost was within the capacity of the most reasonably restricted finance of small towns and districts. The life of this description of road paving might be taken at seven years, and it was claimed for it that the cost was not only less than ordinary macadam, but incomparably less than wood, compressed asphalt, or setts on concrete bed. It was not suggested that this description of pavement should enter into competition with these superior materials of road construction; but it was claimed that on the leading streets of smaller provincial towns, in the secondary and suburban thoroughfares of large towns, where in many cases stone or granite setts were used at heavy cost, tarred macadam properly prepared and laid would form a welcome, valuable, and economic substitute.\*

Mr. Smith Saville, Darwin, who proposed a vote of thanks to Mr. Campbell for his paper, said that he had been accustomed to mix the tar with cold macadam instead of heating the stone in the way adopted by Mr. Campbell.

Mr. Wike, Sheffield, said with respect to the burning of the material they used flues in Sheffield, and thus a great deal of time was saved, because the material could be prepared in twenty-four hours. They had used different kinds of material, and found limestone and furnace slag the best, granite being non-absorbent and consequently unsatisfactory. He found the life of the material to vary considerably, the annual cost in a number of cases, coming out, one at 4d. per yard per annum, another at 7½d., another at 2d., another at 6d., and another at 7½d.: proof that the life and wear varied very much. He had had comparisons got out of the cost of granite and tar macadam, and found that granite was 50 per cent. cheaper.

Mr. Baker, Middlesbrough, believed the most important matter in connexion with the use of tar macadam was the proper boiling of the tar, so as to get the tar of the same consistency. It was also important in the making of the road to get a good sound foundation under the tar macadam. He did not consider the burning of the stone to be necessary, providing that the stone were thoroughly dry, and the tar were properly boiled.

Mr. Lemon, Southampton, remarked that there was no doubt that the cyclist had much to do with the improvement of the roads. There was nothing particularly new about tar-macadam. He had seen it in a good many towns and had seen a good many failures. He considered it best to convert old macadamised roads into tar-macadam roads rather than start with the latter material on an entirely new road, so as to avoid the very heavy cost for foundations referred to by Mr. Campbell. If that plan were adopted they could get a good tar-macadam road for 3s. per yard super. He, however, advised surveyors, if they had no experience with the material, to put the work into the hands of a contractor, or of some one with experience. The tar itself varied considerably in quality, even from the same gas-

\*We hope to be able to print more of this paper in a subsequent issue.—ED.



works, and there were many other details about it which made for success or failure.

The vote of thanks to Mr. Campbell was then agreed to.

#### Refuse Destructors.

Mr. J. Young, C.E., Edinburgh, read a paper on the experience of Edinburgh with refuse destructors. He explained that the refuse carts made a daily round of the whole of the streets of the city in the early morning, and collected all the refuse, together with the street sweepings which the scavengers had collected on their various beats. The total amount of all kinds of refuse collected annually was about 140,000 tons, made up of 100,000 tons of general city refuse and 40,000 tons of mud and street sweepings. About three-fourths of the refuse was despatched by railway to the country, where it was tipped, and the remaining one-fourth was sent to the destructor, but was of very mixed quality, light in weight, bulky in measurement, very dry, and possessing a poor amount of cinders and carbonaceous substances, but containing a large amount of dusty and sandy matter. After referring to the gradual decrease of the demand for refuse on the part of farmers, which led to the appointment of a committee of investigation and the erection of a refuse destructor of ten cells at Powderhall, he dealt with the early difficulties experienced in the working of the destructor by complaints of nuisance on the part of persons in the immediate vicinity, and the consequent action of interdict in the Court of Session. As a result of this action, the destructor was reconstructed and the whole of the old cells were taken down to the under side of the firegrate level, and ten entirely new furnaces built by the Horsfall Refuse Furnace Company. After the Horsfall destructor had been working for about six months a proper test, extending from June 28 to July 12, 1897, or twelve working days, was made for the satisfaction of the arbitrator, Mr. B. Hall Blyth, C.E. At the start of the Horsfall destructor the Corporation accepted an offer by the Syndicate to dispose of the refuse for 1s. 4d. per ton, which was subsequently increased to 1s. 8d. per ton. At the beginning of October last the Corporation took the burning of the refuse into their own hands, and the present cost was 1s. 9 3/4d. per ton. No charge was included for maintenance, tools, repairs, &c., or for repayment of capital.

Mr. Paton, Plymouth, said it appeared to him that Edinburgh had set a very high standard with respect to the collection of refuse, as a daily collection must add enormously to the cost. The figure of 1s. 9 3/4d. per ton for burning the refuse he regarded as somewhat alarming. They had been accustomed to a very much lower figure than that.

Mr. C. Jones, Ealing, said, with regard to the unfortunate position in which the Edinburgh Corporation was placed some time ago, they must bear in mind that a destructor was a novelty. In respect to the decision of the arbitrator in the action against the Corporation, he looked upon their recommendation "that more intelligent and experienced stokers should be employed in the working," as the most important aspect of the whole affair. It was the intelligent working of the small details which went to make up the prosperity of the entire whole. When he came to Edinburgh, and went over the destructor works with Mr. Laws, they arrived at the same conclusion, that the principal difficulty was due to the fact that it was not intelligently worked. With regard to destructors generally, whether of the high or low temperature, he regarded them as a valuable adjunct to a town, but they depended entirely upon intelligent working for their success. With regard to the expenditure per ton of refuse burnt, he admitted that the figures staggered him. The utmost which his destructor had cost him was 1s. 6 1/4d. per ton, and he got a splendid clinker which he had been using for sewage tanks, artificial stone, &c., which reduced the net cost to 3 1/4d. per ton. He warned municipalities and engineers against the idea which was being put forward that they could get a lot of power out of the burning of the refuse to light their towns with electric trams in the streets. Destructors were a means of destroying house and road refuse, and there they had better leave it. If they put up electric works to depend upon the intermittent power to be obtained from the burning of refuse they would make a big mistake whatever patentees might say.

Mr. Wike, Sheffield, remarked that their destructor was in the neighbourhood of certain works of which complaint had been made. The owners, to take the wind out of the sails of the Corporation, began to complain of the smoke from the destructor. The chairman of the committee allowed the complaints to go on for a time and then replied simply to the effect that the destructor had not been working for a month. Their destructors were consuming 10 1/2 tons per cell per day, and the amount of the residuum 2 1/2 per cent.

Mr. Mackenzie supported Mr. Jones' view that destructors should be regarded as dust destroyers and not wealth producers; and they should all insist upon the refuse being thoroughly destroyed. He was pleased that the Edinburgh people were prepared to pay so high a price to have their refuse thoroughly destroyed.

Mr. Parker, Hereford, said, as there was a calorific value in house refuse it was their duty to obtain it and utilise it to produce steam energy. He was struck by the high cost, as at Hereford they were burning their refuse for 7d. per ton, and were producing an excellent clinker.

Mr. Jones explained that he had been utilising the steam produced by his destructor for thirteen years, but it must be regarded as an intermittent power varying with the quality of the refuse.

Mr. Harpur, Cardiff, asked to what cause they attributed their success in getting rid of the nuisance which formerly existed—was it the alteration of the cell or the construction of a dust-catcher?

Mr. Cooper, Edinburgh, said they had experienced much criticism in regard to the destructor, and no doubt quite justifiably. Lord Kelvin had recently told him that he believed they could utilise the heat for their destructor, and by turning it into steam obtain 300 horse-power. If they could do that they would be able to burn their refuse for nothing.

Baillie Mackenzie, Edinburgh, said they heard a great deal of what the Shoreditch and Bermondsey Vestries were doing in producing electric light from the heat generated by their destructors. They had consulted an expert, and were told that if they put up air electric light works at the destructor they might get 150 or 200 horse-power. He thought engineers ought to speak their minds freely and put down the humbug that was talked of getting so much power from destructors.

Mr. Collins, Norwich, pointed out that the bulk of the refuse dealt with in Edinburgh would considerably increase the cost of burning it. With reference to the power to be obtained when destroying winter refuse at Norwich they got a very useful horse-power from the cells, say from 80 to 100 horse-power from the two cells, but during summer time, when they got a good deal of garden refuse, the calorific value was much less.

On the proposition of the President, a hearty vote of thanks was accorded to Mr. Young for his paper.

#### Cable Traction.

Mr. G. N. Colam, C.E., Edinburgh, then read a paper on the "Conversion of the Edinburgh, Leith, and Portobello Horse Tramways System into Cable Traction." He explained that the Corporation had purchased all the tramways within the borough, and they had leased the working for twenty-one years to a company, which agreed to pay 7 per cent. upon the price paid by the Corporation for the old lines, and the same rate of interest upon all money expended in converting to any form of mechanical traction they chose. He thought the Corporation was to be congratulated upon the arrangement made, and suggested that those who advocated municipal working of tramways might consider the arrangement worthy of favour for adopting cable haulage in preference to other mechanical power were that the overhead trolley system would interfere with the appearance of the streets, that the contour of the city was exceptionally hilly, and that the experience of London, Birmingham, and Edinburgh had proved that they could treat with a lessee with full knowledge of the approximate working cost per car mile. Proceeding to explain the extent of the system, he stated that after conversion the tramways would extend to 23,279 miles and 0.870 miles of single track. In 1800 the cost of motive power was 1,279s. as compared with 1,180l. in 1896, maintenance 2,219s. as

compared with 2,710l., car miles 222,822 as compared with 376,725, and passengers 2,582,620 as compared with 3,715,080. Although the mileage had been increased 69.96 per cent. and the number of passengers carried increased 43.88 per cent., the motive power was less. The reduction in cost of motive power had been due to improvements and a slight reduction in the price of coal, and the reason for no increase was that the loads up and down balanced on an average. These figures proved that cable haulage was able to enormously increase its car service and so provide for the future without appreciable increase in its working expenses. An interesting table illustrating this showed that the traffic during the Show week in July, 1893, increased the receipts by 31 per cent., and the rise in working was only 12 per cent.

Mr. Baker, Middlesbrough, mentioned that in Middlesbrough a company were putting down ten miles of tramways on the overhead trolley system.

Mr. Paton, Plymouth, considered that the local circumstances must be the determining factor in guiding the Authority as to the best form of traction to adopt. He could quite believe that with the wide streets existing in the modern part of Edinburgh a cable tramway could be constructed at a moderately small initial outlay, but there would be difficulty in adopting the system in old streets where there was uncertainty as to the depth of drains and gas and water pipes.

Baillie Mackenzie, Edinburgh, remarked that it was a very curious thing that while in America they were throwing out the overhead trolley electric system, they were beginning to adopt it here. Was it the case that the Mayor of Chicago had made an agreement with the different tramway companies that within a certain radius of the centre of the city there were to be no overhead trolley wires? Was it the case that in Washington, Boston, and New York they were throwing out the overhead trolley? It was very curious, and his explanation was that many large syndicates with any amount of money behind them had made a raid upon the municipalities for working electric installations.

Mr. J. Lobley, Hanley, explained that New York would never have the overhead trolley, and therefore it was incorrect to say the system was being abandoned. He was of opinion that the overhead trolley system was the most advantageous for many years, but agreed that the question of system was one which must be decided by local circumstances.

Mr. Colam, in replying to the discussion, and as an acknowledgment of the vote of thanks, said he thoroughly agreed with Mr. Paton that every district required to be considered upon its own merits and requirements, and he considered that the proper people to discuss that point were the local authorities. He knew many districts in the country which could not give better results than the one-horse car, financially.

#### Sewer Ventilation.

Mr. Alexander Stewart, A.M.I.C.E., then read a paper on "Sewer Ventilation," as applied to the water of Leith intercepting sewer. He explained that the scheme, which was designed for dealing with noxious trade refuse, consisted in the catching up by an intercepting sewer of the various sewage discharges. It also intercepted the mill discharges where these could safely be put into a conduit where caustic soda was in use. Certain depositing ponds were constructed for eliminating the material which had a tendency to collect in the inside of the pipes, and so to obstruct the sewer. In order to supply a corresponding amount of water put into the sewer, two reservoirs were increased in storage capacity to the exact equivalent of the waste liquid extracted from the sewer. The sewer extended from low-water mark at the Black Rocks, Leith, for seven miles, and its cost was about 350,000l. In the construction of the sewer street surface ventilators were introduced, but the hot discharges from breweries and distilleries, commingling with the sewage, gave off such noxious smells that ventilator after ventilator had to be closed. The manholes were eventually fitted with a chemical apparatus by the Reeves Chemical Sanitation Company, which had proved successful.

Mr. J. Lemon, Southampton, who proposed a vote of thanks to Mr. Stewart, said the paper raised the important question as to how far manufacturers and others were to be allowed to discharge their noxious refuse into the



sewers. It appeared hard for the Local Authority to have been put to the expense of 350,000l. for an intercepting sewer, and he could not see the justice of the expenditure.

Mr. Greateore, West Bromwich, stated that the results of certain experiments which he had made showed that ventilation by means of shafts was a mistake. He found that in the majority of cases, the shafts did not act at all; the air was coming out of the inlet instead of the outlet.

Mr. J. S. Pickering, Nuneaton, said he noticed it was necessary to utilise the water from the water mains for the flushing of the sewers. As a rule he thought those processes of ventilation which required mechanical aid were not to be preferred if something could be got more simple and requiring less attention.

Mr. Platt, Rochdale, considered it somewhat strange that they had not power to prevent refuse being put into the sewers at a very high temperature. In England the highest temperature at which manufacturers could discharge into the sewers was 110 deg.

Mr. Smith Savile, Darwen, pointed out that in places where they had a staple industry they could not carry out the restrictions of the Act with respect to the discharge of trade refuse into the sewers. He was formerly in a town where water was frequently discharged into the sewers at 212 deg.

The President remarked that he had ventilated upwards of fifty miles of sewers with shafts with absolute and complete success. With respect to the Keeling gas destructor, he found it expensive and unsatisfactory.

The vote of thanks was accorded with acclamation.

[The remainder of our report is held over until next week.]

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee it was agreed to lend the School Board for London 150,000l. for new schools, &c., and the Battersea Overseers 4,800l. for a building for parish meetings.

**The Strand Improvement Scheme.**—Mr. Shaw Lefevre, Chairman of the Improvements Committee, in moving the reception of the main Report of the Improvements Committee, said it dealt with six schemes, including that from Holborn to the Strand. All these improvements involved the expenditure of 1,100,000l., but the main cost was due to the Holborn-Strand scheme,\* which would amount to 774,000l. The scheme had been universally welcomed by the public. He pointed out that it was not a new one, but had occupied the attention of the Council for many years, and was a necessary complement to the schemes in the neighbourhood which had already been approved by the Council, the removal of Holywell-street, the widening of Southampton-row, and the clearing of the Clare-market site. Any delay in accepting the scheme would involve an increased expenditure of some hundreds of thousands of pounds owing to the increase in the value of the adjacent property caused by the improvements mentioned. The scheme was essentially the same as that formulated by Mr. Frederic Harrison, with the exception that the Strand end of the street terminated in a crescent.

The advantage of this plan was that the traffic would be divided going east or west before it reached the Strand. The scheme offered great advantage from an architectural point of view, and would be carried out at a lower net cost than previous proposals. They had made such arrangements that they were able to deal very generously with the Housing of the Working Classes Committee. The cost to the Council would be from 100,000l. to 120,000l. more. They would, however, for the first time in the history of the Council, be able to rehouse all the working classes who were displaced, and would find places for those employed within a mile of the district within that area. From whatever point of view the scheme was regarded, as a street improvement, as a great sanitary improvement involving the improvement of the whole district, or as an architectural improvement, it would add to the dignity and beauty of London, and he believed it was

a scheme worthy of adoption by the Council. He moved the following recommendations:—

"(a) That the Council do apply to Parliament in the Session of 1899 for powers to construct a new street, and branch streets, 100 ft. wide, from Holborn to the Strand, and to carry out the subsidiary street improvements in general accordance with the scheme shown on the plan approved by the Improvements Committee on May 25, 1898. (b) That the question of powers being sought to enable the Council to lay tramways along the new streets be referred to the Highways Committee for consideration and Report. (c) That provision be made for the construction of a subway under the new streets (for mains, wires, &c.), and also for the planting of trees in the new thoroughfares. (d) That provision be made in the Bill for part of the cost of the improvement to be dealt with on the same general principle as that embodied in the improvement charge sections of the London County Council (Tower Bridge Southern Approach) Act, 1895, but that a longer period than three years be allowed within which to judge the effect of the improvement upon the surrounding property. (e) That provision be made by the scheme for rehousing within a mile of their residences all the persons of the labouring class displaced who are dependent on fixed employment in the neighbourhood, and that adequate provision be made elsewhere for the remainder of the persons displaced. (f) That provision be made as far as possible for rehousing the people previously to their being displaced. (g) That if on acquiring any property needed for the improvement, such property shall be proved to be insanitary, compensation shall be paid according to the rules laid down in the Housing of the Working Classes Acts, and not according to the Lands Clauses Consolidation Act, 1845."

Dr. Cooper moved, as an amendment to (a):—"That having regard to the heavy burdens now imposed on the ratepayers of London, the Council declines to apply to Parliament for power to carry out any large metropolitan improvement at the sole cost of the occupying tenants, or which will involve any addition to the county rate, until after the Royal Commission on Local Taxation has reported, or provision been made by Parliament for some equitable division of the net cost of the improvement between the owners of ground values in the administrative county of London and the occupiers thereof."

Mr. Glanville seconded the amendment, but after a long discussion it was negatived by a large majority.

Mr. Bond, M.P., then moved:—"That the following words be added:—Subject to the Church of St. Mary-le-Strand being included within the limits of deviation shown on the deposited plan, in order that the Council may have an opportunity of considering the desirability of removing the church to the southern end of the proposed new thoroughfare or to some other suitable and conspicuous position, thus escaping the cost of acquiring the houses and trade interests on the north side of the Strand and Holywell-street."

Mr. Spokes seconded the motion, and Mr. Wallace Bruce protested against the vandalism involved in interfering with the church. Dr. Longstaff took the same view, and the amendment was lost.

Recommendations (a), (b), (c), and (d) were then adopted.

Dr. Cooper, on recommendation (e) moved as an amendment:—"That provision be made in the Bill for the erection of all the dwellings to rehouse the labouring classes, who will be displaced by the construction of the new street and its branches, prior to the present houses being demolished and the land cleared; and that it be referred to the Housing of the Working Classes Committee to consider and report upon the probable cost of rehousing the displaced people in the vicinity of the new street and at Millbank."

Mr. Shaw Lefevre explained that the cost of rehousing within a mile would amount to about 300,000l., or, roughly, 100,000l. per thousand persons.

This amendment was also defeated, and recommendations (e), (f), and (g) were agreed to.

**Other Improvements.**—The remaining proposals of the Committee as to the reconstruction of Cat and Mutton Bridge, Shoreditch; the reconstruction of the swing-bridge at Old Gravel-lane, St. George-in-the-East; the widening of High-street, Kensington; and the widening of Wandsworth-road, between Vauxhall and Nine Elms-lane, were severally adopted, after discussion.

**District Surveyors for North Fulham and South Fulham.**—The Building Act Committee

reported as follows, the recommendation being agreed to:—

"We have proceeded upon the resolution of the Council of May 24, that applications be invited by public advertisement for the appointments, upon the terms laid down by the Council, of District Surveyors for North Fulham and South Fulham respectively. . . . In response to the advertisement twenty applications were received for appointment to the district of North Fulham, and eighteen as regarded South Fulham. These, however, included applications from one District Surveyor for appointment to North Fulham, and from another to either of the two districts, in each case in addition to his present district. Of course if these two District Surveyors had, without seeking to retain their present districts, each applied for appointment to one of the vacant districts, that course would have been perfectly in order; but, having regard to the fact that applications for the appointments were publicly invited, we did not feel at liberty to entertain those of the two District Surveyors referred to. We referred the applications to a Sub-Committee consisting of the chairman and two past-chairmen of the committee and one other member. The Sub-Committee, having carefully considered the applications and testimonials, invited seven of the candidates to attend before it; and in the result brought up to us the names of the six gentlemen whom it deemed most suitable for the appointments. It may be stated that nearly all the candidates made applications in respect of both districts, so that the lists were very nearly the same in the case of each district. The standing order No. 80, referred to in the resolution of the Council above quoted, provides that 'the committee making the preliminary selection is (unless otherwise ordered) to submit to the Council three candidates, indicating at the same time, if it think fit, the candidate whom it recommends the Council to appoint.' In accordance with the standing order, we now state that the three candidates whom we consider most suitable for the appointment of District Surveyor for North Fulham are Mr. F. W. Hamilton, Mr. S. F. Monier-Williams, and Mr. F. R. Farrow, and the three for South Fulham are Mr. S. F. Monier-Williams, Mr. F. W. Hamilton, and Mr. O. C. Hills. Each of these gentlemen has signed a declaration that he will accept the appointment, if he should be appointed, on the terms laid down in the standing order No. 238, which provides, among other things, that he will not continue private practice. After having given full consideration to the matter, we have decided to make specific recommendations as follows:—(a) That Mr. Frederick William Hamilton be appointed District Surveyor for the district of North Fulham, on the conditions laid down in the Council's standing order No. 238. (b) That Mr. Stanley Faithfull Monier-Williams be appointed District Surveyor for the district of South Fulham, on the conditions laid down in the Council's standing order No. 238."

**Result of Legal Proceedings—Maygrove-road, Hampstead.**—The same Committee reported as follows:—

"Proceedings were taken by our direction in respect of the erection of a stable, constructed of iron and wood, on land belonging to the Midland Railway Company in Maygrove-road, Hampstead, an application for the Council's licence for which structure was refused. At the hearing before the magistrate it was contended that the structure came within the exemption, contained in Section 86 of the London Building Act, from the operation of Part VII. of the Act of structures 'upon the premises of any railway company and used for the purposes of, or in connexion with, the traffic of such railway company.' This contention was based upon the fact that the structure was on the company's land, and was for the use of coal merchants who had their coal carried by the company, the horses which were stabled there being used, amongst other things, for carting the coal to the merchants' wharf on the company's premises. The magistrate decided, however, that the structure was not used for the purposes of the company, but for the purposes of the merchants' private business; that the traffic of a company meant that which was conveyed by the company, and that in the case referred to the conveyance ceased upon the coal being run into a siding, after which the coal became the property of the persons who had bought it. He therefore fined the defendants 10s., and ordered them to pay 21s. costs. The decision is of importance, as defining to some extent the meaning of Section 86 of the Act."

**Proposed Court for Light and Air Cases.**—Mr. Emden has put upon the notice paper the following:—

"That it be referred to the Building Act and Parliamentary Committees to consider and draft a Bill empowering the appointment of a court of assessors to whom shall be referred for decision all questions of light and air in the County of London; such Bill to embody the practice and powers of the Dean of Guilds of Edinburgh as well as such other powers as may be advisable for the better settlement of these questions and the avoidance of useless and wasteful litigation."

The Council, having transacted other business, adjourned.

\* For a plan of the proposed street, see our issue for June 25.



# LANCASHIRE AND CHESHIRE BUILDING TRADES:

## EMPLOYERS' FEDERATION.

THE first annual general meeting of the Lancashire and Cheshire Building Trades Employers' Federation was held on the 26th ult. at the Exchange Station Hotel, Liverpool. Mr. Robert Neill, jun., of Manchester (President of the Federation), occupied the chair, and among a large attendance were Messrs. C. W. Green (Liverpool) and James Storrs (Stalybridge), vice-presidents; W. Marshall and G. Macfarlane (Manchester), J. S. Brown (Liverpool), John Tomlinson (Lytham), secretary, and representatives from almost all the towns in Lancashire and Cheshire. The Executive Committee's report for the half-year congratulated the members on the progress made in organising building trades employers during the past six months. The Federation now consists of twenty-six local associations, having an aggregate membership of 1,320 firms. Negotiations were pending with St. Helens, Wigan, and St. Anne's, and it was confidently expected that these firms would shortly join. Federations are now in course of formation all over the country, and there was little doubt that the recognition by the National Association of the necessity for combination on stronger lines than has hitherto been obtained, has prepared the way for an early realisation of the hope that under one strong national federation builders would be able to safeguard the interests of their extensive industry, and obtain a better appreciation of the importance of their labours. The sawn stone question was the most important with which the executive had to deal. At their first meeting a sub-committee was appointed to consider the position of affairs, and it was decided to recommend that the policy inaugurated by the Lancashire Federation should be carried out, and an attempt be made to remove the restrictions on the free use of this class of building material. The recommendation was ultimately confirmed, with the result that on May 1 the operative masons struck work at Blackburn, Lancaster, Rochdale, Longridge, Radcliffe, Prestwich, and Ormskirk. On May 15 they came out at Manchester and Oldham, on May 28 at Chorley, and on June 1 at Bury. It was resolved to instruct the other federated towns to pay off 25 per cent. of their union masons on May 28, and a further 25 per cent. on June 4, and on June 15 the execution of the notice to remain posted on June 18 for a lock-out of the remaining 50 per cent. of union masons on July 9, unless the dispute was settled before that day. In the event of a protracted struggle the executive were assured of the support of the Yorkshire Federation, and of many of the quarry owners' associations.

The report was adopted, and the Chairman said that any bad feeling that previously existed had passed away. They did not object to pay reasonable wages to good men, but they objected very strongly to be dictated to in the management of their own business.

A form of building contract was adopted, and it was decided to send copies of it to architects and local associations, with a recommendation that that form be used exclusively in the building trade. A form of sub-contract and indenture of apprentices was also adopted.

A long discussion took place in reference to the dispute with the stonemasons now on strike in nine towns in Lancashire.

A sub-committee was appointed to draft a worked-stone rule, and to request a meeting with the operatives, in the hope of settling the dispute in an amicable way. If no settlement be arrived at, the notices, it was asserted, would be carried out.

The plasterers' dispute at Bury, Radcliffe, Prestwich, and Bolton was considered, and it was decided to appoint a sub-committee from the federated towns to consider the question, and to support the local associations if necessary. The resolution submitted by the representatives of the Liverpool Builders' Association condemning the limitation of apprentices was discussed, and it was unanimously decided to object to any limitation in future. The question of the increased cost which would be incurred by reason of the risks to be run under the new workmen's compensation bill was also considered, and it was decided that the architects should be approached with the view of quantities providing for a sum to cover such risks. It was unanimously resolved that in the opinion of the meeting responsible foremen should not be members of any trade unions, and the Secretary was instructed to obtain information to lay before a future meeting with the view of forming separate societies for foremen and builders' clerks.—*Liverpool Courier.*

THE WIDENING OF PARLIAMENT-STREET.—In the House of Commons on the 30th ult., in reply to Sir H. Fowler, Mr. Akers Douglas said: I have not yet been able to acquire the whole of the property between Parliament-street and King-street. I hope to do so within the next three months. Directly this property has been obtained the buildings will be taken down and the street widened. A plan showing approximately the proposed frontage line of the new buildings next Parliament-street and Great George-street shall be prepared and exhibited as the right hon. gentleman desires.

# APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

## Lines of Frontage.

**Islington, North.**—One-story stable erected at the rear of No. 94, Moray-road, and abutting upon Moreland-street. (Mr. J. B. Pinchbeck for Mr. D. Evans).—Consent.

**Lewisham.**—One-story shops upon part of the forecourts of Nos. 28, 30, 30A, 32, 32A, 34, and 36, Catford Hill (Messrs. D. & R. Kennard).—Consent.

**Lambeth, North.**—An angle porch and oriel windows to a proposed new building on the west side of Albert Embankment (Messrs. Humphreys, Davies & Company, for Messrs. Freeth & Pocock).—Consent.

**Clapham.**—That the application of Messrs. Lee & Pain for an extension of the periods within which the erection of houses on the south side of Poynder's-road, Clapham Park, on part of the grounds of Bygrave House, was required to be commenced and completed, be granted.—Agreed.

**Fulham.**—Three houses on the east side of Parson's Green-lane, with the flank of the northernmost building to abut upon Harbledown-road (Mr. T. J. Nicols).—Consent.

**Hackney, North.**—That the application of Mr. P. D. Smith for an extension of the period within which the erection of a vestibule to St. Andrew's parish-rooms on the east side of Bethune-road, Stoke Newington, was required to be commenced, be granted.—Agreed.

**Hampstead.**—A one-story hall or parish-room, on the north side of Frogmal-lane, near its junction with Finchley-road (Mr. W. Wallace).—Consent.

**Hoxton.**—A two-story oriel window erected in front of stable-buildings recently constructed on the north side of Craven-street, City-road (Mr. E. Newton for Mr. G. Patten).—Consent.

**St. Pancras, East.**—A three-story bay-window in front of No. 41, Camden-square, Camden Town (Messrs. W. F. Meakin & Son for the Rev. A. Farquharson).—Consent.

**Wandsworth.**—One-story shops upon part of the forecourts of four houses on the north side of Wimbledon Park-road, Southfields, westward of Garmoor-gardens (Mr. G. W. Elwell for Mr. A. W. Gower).—Consent.

**Clapham.**—One-story shops upon part of the forecourts of Nos. 73 and 75, Clapham-road, Battersea (Mr. G. E. Varden for Mr. G. Burcham).—Refused.

**Greenwich.**—Fifteen houses on the east side of Glencue-road, Westcombe Hill (Mr. J. H. Haire).—Refused.

**Lewisham.**—A house on the west side of Bovill-road, Brockley-road, to flank upon Whatman-road (Mr. G. Trotman, for Mr. F. J. Long and Dr. Wheeler).—Refused.

**Peckham.**—A house, with a one-story shop, on the east side of Hall-road, to abut also upon Hichison-road, Peckham-rye (Mr. E. J. Salter, for Mr. G. Dutton).—Refused.

**St. George, Hanover-square.**—An iron and glass shelter at the entrance to No. 23A, Old Bond-street (Mr. W. Wallace, for Messrs. Langlier).—Refused.

**St. George, Hanover-square.**—Wood and glass enclosure erected at each end of the covered balcony at the first floor level of No. 16, Curzon-street, Mayfair (Messrs. G. Trollope & Son).—Refused.

**St. George, Hanover-square.**—An iron and glass shelter at the entrance to the Coburg Hotel, Carlisle-place, Mount-street (Messrs. Hart, Son, Peard & Co., Limited, for the Coburg Hotel Company).—Refused.

**St. George, Hanover-square.**—A four-story oriel window at the Ashburnham-mansions, Hay-hill, Berkeley-street (Mr. J. Macvicar Anderson for Messrs. A. Young and B. Benjamin).—Refused.

**Strand.**—A three-story oriel window in front of a proposed building on the site of No. 45, Wych-street (Mr. J. Webster for Mr. E. Clarke).—Refused.

**Westminster.**—A projecting porch and pilasters to the Gordon Hospital for Fistula, proposed to be erected on the site of Nos. 126, 128, and 130, Vauxhall Bridge-road, and Nos. 2, 4, 6, and 8, Bloomburg-street (Mr. H. E. Pollard for hospital authorities).—Refused.

**Woolwich.**—A two-story store and stable at the rear of No. 163, High-street, to abut upon Bannockburn-road, Plumstead (Mr. J. Hart for Mr. H. Fenn).—Refused.

## Space at Rear.

**Clapham.**—That the Council do, in the exercise of its powers under Section 41 (1) (vi.) of the London Building Act, 1894, allow a modification of the provisions of that Section with regard to open spaces about buildings, so far as relates to a two-story building, No. 249, Queen's-road, Battersea, erected with an irregular space at the rear (Mr. W. Garton).—Agreed.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

**Wandsworth.**—That the Council, in the exercise of its powers under Section 41 (1) (iii) (b) of the London Building Act, 1894, do not allow the erection of a row of stables on the north side of a proposed messes to lead out of Heathview-gardens, Putney Heath, such stables to abut at the rear upon an open space (Mr. P. E. Pilch).—Agreed.

**Westminster.**—That the Council do determine not to sanction the extension above the diagonal line mentioned in Section 41 of the London Building Act, 1894, of a portion of the proposed main building to be erected on the site of No. 3, Buckingham-gate, and Nos. 1, 3, 5, 7, 9, and 11, Stafford-place, and that the Council in the exercise of its powers under that section do not permit the erection of a portion of the rear of the building next Palace-street to a height of 30 ft. to the base of the gable, and with two stories in the roof (Mr. A. Green for Mr. E. J. Cave).—Agreed.

## Deviation from Certified Plans.

**St. George, Hanover-square.**—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of No. 6, Bruton-street, at the corner of South Bruton-mews (Mr. A. J. Thompson).—Consent.

**Holborn.**—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a block of residential flats on the site of Nos. 33 and 33A, Red Lion-square, and No. 11, Old North-street, Ely, E. J. Stubbs for Messrs. T. Millman & Co.).—Consent.

**St. Pancras, East.**—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "Rising Sun" public-house, No. 120, Euston-road, at the corner of Chilton-street (Messrs. Shoebridge and Rising, for Mr. W. Chapman).—Consent.

**Whitechapel.**—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of a block of residential flats, Leman-street, Whitechapel (Mr. I. Mason for Mrs. Matthew Lee).—Consent.

**St. George, Hanover-square.**—Certain deviations from the plans certified by District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a block of residential flats, with three shops on the ground floor, on the site of Nos. 12 and 13, Grafton-street (Mr. F. M. Elgood for Major G. Paynter).—Refused.

**St. George, Hanover-square.**—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a block of residential flats, with shops on the ground floor, on the site of Nos. 44 and 45, New Bond-street, and No. 55, Maddox-street (Mr. E. K. Purchase).—Refused.

**St. George, Hanover-square.**—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a block of residential flats, with shops on the ground floor, on the site of No. 130, New Bond-street, and premises at the rear abutting upon Grosvenor-street (Messrs. Boehmer & Gibbs for Mr. T. L. Green).—Refused.

## Line of Fronts and Width of Way.

**Hoxton.**—A block of water-closets and two enclosed porches to the central school of St. John's-road Board Schools, to abut upon Gloucester-row (Mr. T. J. Bailey, for the School Board for London).—Consent.

**Deptford.**—A warehouse at Nos. 84 and 86, Tanner's-hill (Mr. J. Webster, for Mr. W. Burrows).—Refused.

## Line of Fronts and Space at Rear.

**Holborn.**—That consent be not given, under Section 73 of the London Building Act, 1894, to the erection of oriel windows on both frontages of a block of residential flats, with shops on the ground floor, on the site of Nos. 114, High Holborn, and premises abutting upon Southamilton-row; that the Council do determine not to sanction the extension, above the diagonal line mentioned in Section 41 of that Act, of a portion of the proposed block of flats (Mr. A. Keen, for Messrs. Keen).—Agreed.

## Width of Way and Space at Rear.

**Rotherhithe.**—That the Council, in the exercise of its powers under the London Building Act, 1894, do not consent to, nor permit of, and do also determine not to sanction the erection of a block of buildings, adapted to be inhabited by persons of the working class, on the west side of Elgar-street (Mr. J. S. Gaskell for the Surrey Commercial Docks Company).—Agreed.

## Line of Fronts, Width of Way, and Space at Rear.

**Peckham.**—A porch in front of a proposed warehouse and offices on the site of Nos. 26, 28, 30, 32, and 34, St. John-street, High-street (Mr. G. P. Smedley for Mellin's Food, Limited).—Refused.



**Line of Fronts and Construction of Buildings.**

**Battersea.**—A wood and glass photographer's show-case on part of the forecourt of No. 449, Battersea Park-road (Mr. E. Walker).—Refused.

**Lewisham.**—A wood and glass show-case, erected on the forecourt of No. 1, London-road (Mr. W. Hart-Gritten for Mr. R. M. Jamieson).—Refused.

**Formation of Streets.**

**St. George, Hanover-square.**—That an order be issued to Mr. E. Balfour sanctioning the formation or laying out of a new street for carriage traffic, to lead out of the south side of Aldford-street, Park-lane, for the Duke of Westminster. That the name Streets-mews (in continuation) be approved for the new mews.—Agreed.

**Deptford.**—That an order be issued to Mr. F. Matcham sanctioning the formation or laying out of a street to lead out of Watson's-street into Charles-street, the formation or laying out of an extension of Watson's-street, and a widening of a portion of that street (for Mr. O. Stoll). That the names Watson-street (in continuation) and Empire-place be approved for the new streets.—Agreed.

**Fulham.**—That an order be issued to Mr. W. C. Poole sanctioning the formation or laying out of two new streets for carriage traffic, to lead out of Fulham Palace-road into Woodlawn-road, and the widening of Cranberry-street, and a widening of the names Watson-street (in continuation) and Empire-place be approved for the new streets.—Agreed.

**Lewisham.**—That an order be issued to Mr. J. W. Webb sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of the south side of Brockley-rise. That the name Rowenden-street be approved for the new street.—Agreed.

**Wandsworth.**—That an order be issued to Mr. P. E. Pidditch, refusing to sanction the formation or laying out of a new street, for carriage traffic, with one entrance on the west side of Heathview-gardens, Portsmouth-road, Putney-heath.—Agreed.

**Wandsworth.**—That an order be issued to Messrs. Rawlings & Son, refusing to sanction the formation or laying out, for carriage traffic, of new streets on the Wandhouse Estate, to lead out of the west side of Garratt-lane (Mr. W. F. Palmer).—Agreed.

**Means of Escape at Top of High Buildings.**

**Marylebone, West.**—That the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, do grant a certificate in respect of the means of escape in case of fire provided for the persons dwelling or employed on the fifth floor of block 8, Bickenhall Mansions, Marylebone-road (Mr. W. H. Scrymgeour).—Consent.

Recommendations marked † are contrary to the views of the Local Authorities.

**NEW DIRECTORIES.**

"KELLY'S Directory of the Building Trades, 1898" (Kelly's Directories, Limited, 182, 183, 184, High Holborn, W.C.) is the eighth edition of a most useful work of reference, of the reliability and the excellence of which we can speak from experience. Since the last edition, the directory has increased in size, the work now extending to 2,314 pages as against 2,185 in the last issue. We are not aware that any new features have been introduced into the present edition, which, like its predecessor, comprises every trade and profession connected with architecture and building in England, Scotland and Wales, as well as in the principal towns in Ireland and the Isle of Man. The work includes lists of County Surveyors and Borough Surveyors, places in England with the names of persons carrying on business in each, arranged alphabetically in counties; places in Scotland, Wales, Isle of Man, and Ireland, with the names of persons carrying on business in each, arranged alphabetically in towns; and a list of trades, arranged alphabetically, in London and suburbs and in England, Scotland, Wales, and Ireland. In the interesting preface to the work, it is stated that there are 7,842 architects, 5,836 surveyors, and 37,815 builders engaged throughout England and Wales, the builders giving employment to 686,750 men in the subsidiary branches of the building trades, while there are 89,829 men employed in trades more or less connected with the building trade. In addition to these, there are 599,075 general labourers not otherwise particularised; also 58,567 artisans and mechanics undefined. The Directory is well printed and arranged, and is an invaluable work of its kind.

"The City of London Directory for 1898" (London: W. H. & L. Collingridge, City Press Office) is the twenty-eighth annual edition of an excellent work containing exclusive information respecting the City, its streets, trades,

local government, Livery and other Companies, charities, &c. The official section contains information concerning the lately-constituted Public Health Department, which has taken over the work of the late Commissioners of Sewers, and the same section gives particulars of the City churches. The Livery Companies Guide supplies exclusive information—the names and addresses of the masters and courts of assistants, engravings of the arms, the historical accounts of the foundation of the companies, their ancient powers and present privileges, and their charities. The Biographical Section has been extended by the addition of the portraits and biographies of many of the masters of the Livery Companies, Aldermen, and principal officers of the Corporation. The devastation caused by the Cripplegate fire is duly taken cognisance of. The fire caused the displacement of about 150 occupiers in Jewin-street, Wells-street, Hamsell-street, and adjoining thoroughfares; the new addresses of all these are given, and for convenience of tracing them, the position of the buildings before the fire has been retained, the new addresses in which the businesses are now carried on being set forth. There have been several improvements in the streets and by-ways of the City during the past twelve months, and these have been noted upon the very useful map given in the Directory. The route of the City and South London Railway is indicated, showing the two City stations, Moorgate-street (entrance from Finsbury-pavement), and King William-street, at the corner of Lombard-street under the Church of St. Mary Woolnoth. The information contained in the Directory is both exhaustive and reliable, and in the City the work must be as indispensable as the Post Office London Directory is for the whole of London.

The "London Manual, 1898-99" (Edward Lloyd, Limited, Salisbury-square, E.C.), contains an introduction by Sir Walter Besant and a full account of the work carried on by the public authorities engaged in governing the Metropolis. This year's issue, which includes a useful list of all the members of public bodies in London, is illustrated. The "Manual" is well arranged, and appears to be thoroughly up to date and reliable.

**BOOKS RECEIVED.**

THE ENGLISH FLOWER GARDEN. By W. Robinson (John Murray).

MY HOME, AND HOUSEHOLD COMPENDIUM. By J. W. Jarvis and W. J. Woods (Simpkin, Marshall, & Co.).

ARCHITECTURE AMONG THE POETS. — By H. Heathcote Statham (B. T. Batsford).

IRON AND STEEL BRIDGES AND VIADUCTS. — By Francis Campin, C.E. (Crosby, Lockwood & Son).

SEWER CONSTRUCTION. — By W. H. Maxwell (Hodgetts).

**Correspondence.**

To the Editor of THE BUILDER.

**TUDOR-STREET ANCIENT LIGHT CASE.**

SIR,—In further illustration of your report of this case, and of the effect of Mr. Justice Kekewich's judgment, the following details may be of interest:—

The plaintiffs' building is on the north side of Tudor-street, which is 40 ft. in width; the defendants' building (of which Messrs. Goodey & Cressall, of Colchester, are the architects) is on the south side, and is distant from the plaintiffs' building 52 ft. in a lateral direction of 50 deg., and 32 ft. distant from a point directly opposite to the plaintiffs' windows. The judgment is that lateral light at an oblique angle in a fairly wide street must be preserved by the pulling down of a new building (which was not erected in defiance of any undertaking) to a level which will leave 68 deg., so that in Tudor-street, which is 40 ft. wide, a new building opposite to the end of another street is limited in height to 30 ft. by an ancient light, 32 ft. away from it laterally. This decision seems to establish new data for the practice of surveyors and to encourage the multiplication of claims from distant neighbours.

BERESFORD PYTE.

**LIBRARIES OF THE MIDDLE AGES.**

SIR,—The interesting discussion on the origin of the modern bookcase raised by Mr. Jackson in his paper recently at the Institute, and referred to afterwards by Mr. Willis Clarke, reminds me of

some bookcases in St. John's College, Oxford, which may be even earlier examples than those at Lincoln quoted by Mr. Clarke as having been designed by Wren in 1675.

The Inner Library at St. John's was added by Laud in 1631-5, and although the west wall has windows at close intervals in unison with the Old Library (1596) adjoining, the opposite wall, which forms the famous garden front of St. John's, has blank spaces 11 ft. long between the windows. When this library was gutted and Gothicised with oak-grained plaster roof and oak-grained stucco angels by Blore, about 1840, the old bookcases were sold by auction, and fetched 30s. each! Luckily one of them was bought by the President, and is still to be seen in his lodgings. It appeared to me to be contemporary, and certainly bears a most elaborate display of Laud's arms and crest worked into the open work of the bronze panels forming the doors. That these cases were actually made at the time the library was built I have no certain knowledge, but from the fact that the walls of the room appear suited to such cases, and that the room was avowedly prepared for the manuscripts and smaller books, and judging from the cases themselves, of which I enclose a tracing, I should say they must date nearly, if not quite, as early as 1635—the time when the building was opened.

Possibly a reference in the State Paper Office to the rough draught of Laud's plan for his building might give some information on the point. The document is endorsed "*Mye intention for charlyte soe soon as God shall make me able*," and, judging from an extract, goes very thoroughly into details.

The original bookcases in the old part of the library are interesting examples of the two-shelved case—no doubt arranged for chains—raised at a later period by a couple of additional shelves. The seats and desks are all complete, and are, I think, finer examples than those in the more famous and undoubtedly finer room of the Merton Library.

F. W. TROUP.

**The Student's Column.****SOUND, LIGHT, AND HEAT.—II.****SOUND : PRELIMINARY CONSIDERATIONS.**

**B**EFORE attempting to make practical use of what is known of the science of sound, it will be well to consider what sound is.

We may remind the student that the term "matter" is applied to anything which possesses weight, and to anything that can receive and communicate motion, and to anything that can affect our senses. The word "substance" is synonymous with "matter" in the scientific sense. Matter is divisible into three classes, viz.: solids, liquids, and gases. There being many properties possessed by the last two classes which may often conveniently be considered together, these two are frequently designated by one term only—"fluids." When we use the last-mentioned word, therefore, the student will perceive that we do not necessarily mean "liquids."

An elementary acquaintance with "bodies" soon shows us that the matter of which they are made is not perfectly continuous, but is composed of extremely minute parts, which, although well known to be present, can only be theoretically defined. The smallest conceivable part of matter is called an "atom," and it is very necessary to our inquiry that the following, concerning atoms, should be constantly borne in mind. An atom cannot be divided, and it is never, in any form of matter, joined to another atom; there is always a space between them. This at first sight appears a little difficult to comprehend, and the circumstance that it is generally understood that this space or distance is great as compared with the size of the atoms does not assist the perception very much. No one has ever seen an atom, nor, of course, the inter-atomic distances referred to. The whole is assumed, but the grounds for the assumption are so great and the theory so well founded, as explaining so much in both physics and chemistry, that in the absence of anything better we are compelled to give a large amount of credence to it. At any rate, so far as this elementary series of articles is concerned, we shall regard the assumption as an actual fact.

A "molecule" is made up of two or more atoms, but here, again, we cannot see a molecule; the smallest groups of molecules we can actually obtain and observe are called "particles." The student is cautioned not to employ or think of these terms loosely, as one is frequently apt to in every-day conversation. A "particle" has a distinct meaning in physics.

To recapitulate, the smallest artificially obtainable particle of matter—whether solid or



fluid—is composed of molecules which are themselves constructed of atoms not joined together, but separated from each other. We shall presently have occasion to speak of the moving of these atoms and molecules within masses or particles of matter. Then it will be seen, constructively, that no matter how rigid a body may seem, it is in reality composed of molecules which are ever at work, or are at least potentially workable. Unless this is thoroughly appreciated, we shall not be able to understand what sound is.

Molecules are very peculiar things. In order to make a "body" they must of necessity be controlled to some extent, and that controlling power is termed "molecular force," which holds them in position. The application of this force permits them to present themselves in various states of aggregation, which may thus be summarised: when the relative positions of the molecules of bodies are *fixed* and cannot be altered without the application of exterior force, those bodies are said to be solid; when the relative positions are *not fixed*, but the molecules can easily glide over each other so as in the aggregate to be able to take on the form of any vessel in which they may be placed, those bodies are termed liquid; and when the mobility of the molecules is still greater than in liquids, and the bodies are incessantly struggling to occupy a greater space, being dependent in that respect upon pressure, such bodies are called gases.

We will now pass on slowly to discuss some of the general properties of matter. The principal of these are divisibility, porosity, extension, impenetrability, inertia, weight, compressibility, and elasticity. All bodies can be divided into smaller parts; though there appears to be a limit to this when we arrive at the exceedingly minute atoms which are assumed to be indivisible. Porosity is a property where interstices or pores exist between the molecules; liquids have no pores (as that term is commonly defined), but spaces exist all the same between the molecules of which the liquid bodies are composed. The property of extension is demonstrated by the fact that every body occupies a limited portion of space. Impenetrability implies that no two portions of matter can at the same time occupy the same space. Inertia is a negative quality of matter, by virtue of which it is incapable of changing its state of rest or motion. Thus, if at rest, some external force must be employed to make it move; and if in motion it would keep moving for ever and in the same direction as that initially imparted to it, provided all resistance were removed. To take an illustration: A ball having been thrown upward there would be no reason why it should not continue in the same direction for ever if it were not overcome in its motion by the operations of gravity and friction, which compel it to return to the earth. All bodies possess weight, which property is the result of the earth's attraction on the particles composing them.

As a consequence of porosity, bodies are "compressible," i.e., their volume may be diminished by the application of pressure. Gases are the most compressible, solids less so, and liquids least of all; indeed, the last mentioned possess this property only to a very small extent.

The property of "elasticity" is, perhaps, the most important to us in studying the theory of sound. It may be defined as being due to bodies resuming their original form or volume when a force which altered that form or volume ceases to act. Elasticity may be developed by pressure, twisting, bending, or pulling. Fluids are perfectly elastic; solids are only partially so, and that within wide ranges of variation. In other words, there is a limit to the elasticity of solids; if that be exceeded they either break or will not return to their original form. It is known technically as the "limit of elasticity." Many substances are readily recognised as being elastic—caoutchouc for instance; others regain their original form and volume so readily and with lightning-like rapidity, that the actual deformation and springing back are only with difficulty recognised. Atkinson\* mentions an easy experiment to demonstrate elasticity in such bodies as these. If a ball of ivory, glass, or marble be allowed to fall upon a slab of polished marble, which has been previously slightly smeared with oil, it will rebound and rise to a height nearly equal to that from which it fell. On afterwards examining the ball a circular blot of oil will be found upon it, more or less extensive according to

the height of the fall. From this we conclude that at the moment of the shock the ball was flattened, and that its rebound was caused by the effort to regain its original form. The slab of marble would also, to a limited extent, be affected at the point of impact.

To demonstrate that a gas is readily elastic, let us take a vessel containing, say, 3 cubic feet, and compress the gas into the space of 2 cubic feet. Considerable pressure will be required to do that, and the gas will exert great force from within, so much so that unless the vessel containing the gas is very strong it will be burst to pieces. This is an attempt on its part to regain its original volume. If now the pressure be removed the gas will resume its original form and volume—proving its perfect elasticity. From a consideration of the compressibility of gases, which, as we have seen, is closely connected with their elasticity, we have it laid down in Boyle's law that "the volume of a gas varies inversely as the pressure to which it is subjected when the temperature remains the same."

And now we come more directly to the consideration of what sound is. Briefly, it may be stated as the "result of rapid oscillations imparted to the molecules of elastic bodies when the state of equilibrium of these bodies has been disturbed either by a shock or by friction. Such bodies tend to regain their first position of equilibrium, but only reach it after performing, on each side of that position, very rapid vibratory movements, the amplitude of which quickly decreases. . . . Physiologically, sound is the sensation excited in the organ of hearing by the vibratory motion of bodies, when this motion is transmitted to the ear through an elastic medium" (Atkinson). That sound is really the result of vibration may be readily demonstrated: Take a bell jar and strike it smartly; it emits sound, which, however, can be immediately stopped by pressing a finger on the outside rim or edge. The vibrations can be distinctly felt as the finger is placed in that position. Again strike the jar, and holding it horizontally, place a small piece of metal within, when the latter will be seen to be violently shaken, the movement being imparted to it by the vibrations emitting the sound, and the quality of the sound is to some extent modified by the metal fragment. The vibration of the strings of the harp and other musical instruments may also be referred to in this connexion.

Sound is propagated in all elastic bodies, but not in *vacuo*. A pretty experiment is usually made to demonstrate this. A bell continually struck by a clockwork arrangement is placed in the receiver of an air-pump. The sound is distinctly heard outside; but, if the air be withdrawn from the receiver, no sound will reach us, though we can see that the bell is still being struck. On the air being gradually re-admitted we at first hear a faint sound of the bell, which sound becomes stronger as the air is more fully admitted. Conversely, in proportion as the air is withdrawn, the sound becomes feebler. The propagation of sound in air will be more fully considered in the next article; but the student can doubtless already see that its transmission is to a large extent governed by the state of the air, and that a medium of some density is requisite for its successful propagation. It is too early yet to apply this fact practically to the interior of buildings, as so many other points not touched upon have to be considered in the same connexion; but, *carceris paribus*, with a hall crowded with people and bad ventilation, the state of the air may be such as to distinctly modify the quality or intensity of sound propagated within it; we will not say more than that at present.

#### GENERAL BUILDING NEWS.

**CHURCH, IPSWICH.**—The foundation-stone has just been laid of the new St. John Baptist's Church, Ipswich. Sir Arthur Blomfield is the architect. The outer and interior walls will be of red brick, with Monk's Park stone dressings, the roof being of pitch pine, with Broadley tiles. The interior will consist of a nave and side aisles, a clergy vestry at the north-east corner communicating with a choir vestry, and underneath will be a heating vault, for warming the church by means of hot-water pipes, passing under gratings in the wood-block floor. At the opposite corner will be the organ chamber, the chancel being situated midway. There will be four entrances—two on the west side on either side of the baptistry, one at the south-east corner, and one by the clergy vestry. The roof of the nave will be supported off the clearstory walls, and the pillars dividing the

nave from the aisles will be of red brick, alternately circular and octagonal. The chancel, 20 ft. by 25 ft., will be approached from the nave, which is 91 ft. long by 28 ft. 6 in. wide, by four steps. There will be one step from the chancel to the Communion table, on the south side of which will be a sedilia, of Monk's Park stone, with marble shafts. Cathedral glass will be utilised for the windows. A four-light window at the west end will be placed immediately over the roof of the baptistry, and this portion of the façade will be completed by a bell-turret, with provision for two bells and a weather vane. Ample accommodation will be provided in the vestries—that for the choir being 16 ft. square, and that for the clergy slightly smaller. The space allotted in the organ-chamber is 18 ft. by 11 ft. 9 in. The pulpit will be carved in oak, the font being of stone, with marble shafts. Only a portion of the body of the church is to be constructed at first, providing seating accommodation for about 600.

**CHURCH OF ST. PATRICK, BALYMCCAR, ARMAUGH.**—This building has just been dedicated by Cardinal Logue. The new church has been designed by Mr. J. J. McDonnell, of Belfast, and the work has been carried out by Mr. James Hughes, contractor, Newry. It consists of nave, sanctuary, side chapel, sacristy, and porch. The sanctuary, which is semi-octagonal in form, is lighted with three two-light mullioned and tracery windows. The materials used are a local stone and Armaugh limestone, which is used as a dressing to the windows and elsewhere. The roof is of pitch pine.

**RESTORATION, ST. PETER'S CHURCH, BARTON.**—The outlay on the restoration of this church has been about 1,000l. Mr. C. H. Fowler, F.S.A., was the architect. The alterations consist of the building of a new clergy vestry, the addition of an organ aisle, the restoration of the ancient oak tower, the rebuilding of the wall leading to the church, and widening of the path to the south door, taking the old plaster from the north, south, and east walls of the nave, and pointing the stone work of the same. A new organ, by Messrs. Forster & Andrews, of Hull, has also been put in at a cost of 850l. Besides a gift of 1,000l. by Mrs. Holt, the same lady gave a special sum of 250l. for the restoration of the screen. Other gifts by Mrs. Holt are new oak altar rails, which have been made by Mr. John Potts, of Barton. Canon Moor, of Gainsborough, has given a new carved oak pulpit.

**Mission Church, NEW HOUGHTON.**—A mission church, which has been erected at a cost of over 1,100l., has just been opened at New Houghton, Plesley. The architect was Mr. P. H. Curry, Derby, and the builder, Mr. J. Warner, Plesley.

**PARISH CHURCH EXTENSION, LEAMINGTON.**—On the 30th ult. the Mayor of Leamington laid the corner-stone of the new nave and bell-tower of the Leamington Parish Church. When the work, for which Sir Arthur Blomfield is the architect, is completed, the nave will be about twice its present length, and the seating accommodation will be considerably increased. The new tower, in which it is intended to place the peal of six bells, will stand at the south-west angle of the church. It is estimated that the whole work of restoring and completing the church will cost 15,000l.

**CHURCH, WREXHAM.**—A new church, dedicated to St. Peter, has just been opened at Wrexham recently. The church has been built of brick at a cost of nearly 1,500l. It will accommodate 230 people. The builders were Messrs. Rogers & Son, Brynno, the architect being Mr. J. H. Swainson, Wrexham.

**CHAPEL, MILL HILL SCHOOL.**—At the celebration on June 22 of the "New Foundation Day," the new chapel was opened with appropriate services. It was erected at a cost of 6,000l. from the plans and designs of Mr. Basil Champneys.

**CHURCH, ST. LUKE, WEST HAMPTON.**—The memorial stones of the new church for this parish, formed in 1896, were laid on June 18. The estimated cost of the church is 11,500l. The architect is Mr. Basil Champneys.

**QUEEN'S CROSS FREE CHURCH, GLASGOW.**—The memorial-stone of Queen's Cross Free Church has just been laid. The church, which is situated at the corner of Garscube-road and Springbank-street, is being built from designs prepared by Messrs. Honeymann & Keppie, architects. The principal feature of the building is a tower placed at the corner of the two streets. This is flanked in the Garscube-road by the transept gable, and in Springbank-street by the window of the choir chamber. The building will provide accommodation for 700 sitters and a choir of thirty members. There is a transept and back gallery, and behind and at the side of the pulpit are the organ-chamber and seats for the choir. At the back of the church is a hall seated for 260 persons. The estimated total cost for site and buildings is about 8,000l.

**THE PROPOSED METHODIST FREE CHURCH, WHITWOOD MERE, CASTLEFORD, YORKSHIRE.**—It is proposed to erect at Whitwood Mere a memorial church and Sunday school for the United Methodist Free Church. The church is designed in the Gothic style, to be erected in brick with stone dressings, and the principal roof covered with green Westmoreland slates. The principal feature of the elevation will be a square tower with spire, placed at the corner. Vestibules lead into the body of the chapel, which will accommodate 300 worshippers. A gallery for sixty people is provided over the entrance, and a special gallery for

\* Ganot's "Physics," 1893 ed., p. 9.



the choir at one side near the rostrum. The organ chamber is placed over the minister's vestry. The seating will be of pitch pine. The site will also allow of a Sunday school of two stories, with classrooms, &c., being erected at some future time. The contractors for the work are—Brick and mason work, Messrs. R. Walker & Sons; carpenter and joiner, Mr. William Holland; slater, Mr. S. Evison; plasterer, Mr. Beighton; plumber and glazier, Mr. Bateson; painter, Mr. Watson; and the architect is Mr. Arthur Hartley, of Castledore.

**SUNDAY SCHOOLS, LEEDS.**—The new Sunday schools which have been built at a cost of 6,600*l.* in connexion with Oxford-place Wesleyan Mission, Leeds, were opened on the 28th ult. The erection of the schools is only part of a scheme which also includes the building of a lecture or synod hall and the re-modelling, re-seating, and renovating of the chapel, and the introduction of the electric light. The new buildings, which have been designed by Mr. G. F. Danby and Mr. W. H. Thorp, comprise a schoolroom, 64 ft. by 34 ft., having an open timbered roof, and capable of seating 650 people, fourteen class-rooms, and accommodation for social and evangelistic work. The contractors were Messrs. W. Thompson & Sons, Mr. G. Thompson, Mr. H. Pearson, Mr. Thos. Harrod, Messrs. Holmes & Co., and Messrs. J. & H. Smith.

**FREE CHURCH, FOCHABERS, MORAYSHIRE.**—Plans prepared by Messrs. D. and J. R. McMillan, architects, Aberdeen, for the proposed new Free Church at Fochabers have been sanctioned by the deacons' court.

**FERME PARK CHURCH, HORNSEY, N.**—Designs were recently invited from four architects for this building, and those submitted by Mr. George Baines, of 5, Clements-inn, Strand, W.C., were adopted. The general plan of the church is a Greek cross, with wood vaulted ceiling, carried up to a higher section in the central crossing, with an air trunk therefrom to an external roof ventilator. The central crossing is divided from the four arms by a four-centred Gothic arch and a moulded stone arch, while stone shafts carried up from the floor with moulded caps and bases, divide the body of the church from the organ chamber behind the pulpit. The front of the gallery for the organ will be of open tracery woodwork. A late period of Gothic architecture has been adopted, which will harmonise with the existing school chapel. The church will be faced with red bricks, with warm buff terra-cotta dressings, quarry lights to the windows, and green slates to roofs. Internally, the four main central arches, and the arches from same to the four arms, will be supported by four red polished granite columns, having moulded stone bases and moulded and carved capitals, and these columns will assist in supporting the galleries on three sides, which are grouped round a wide central well. The pulpit is placed in the centre. In front of the pulpit, and partly under it, also, is a white marble open baptistry, with marble steps and curb, and oak-moulded handrail in front, supported on wrought-iron and brass standards. Steps from the baptistry lead down on each side from the aisles, and steps up under the pulpit lead direct to two separate vestries, as dressing-rooms. Heating will be by hot water apparatus. The accommodation provided is as follows:—On ground floor 650 sittings, in galleries 464. The body of the church slopes up from the pulpit end to the back. Two large vestries are provided in addition to the two dressing-rooms behind the baptistry. There are two ante-rooms or cloak-rooms also connecting the church with the existing lecture hall and school chapel. There are six separate exits from the ground floor for technical instruction, for boys, and for the girls, and these are placed at each end of the building. The architect is Mr. J. Mitchell Bottomley, of Leeds. The clerk of the works is Mr. Robert F. Douglas, and the contractors for the whole of the work are Messrs. Kelly & Preston,

all of Douglas. The contract amounts to the sum of 7,911*l.* 11*s.* 0*d.*

**PUPIL TEACHERS' COLLEGE, LIVERPOOL.**—The Lord Mayor of Liverpool (Alderman John Houlding) has just opened the new Pupil Teachers' College, which has been erected in Clarence-street, Liverpool. The new institution is estimated to have cost over 17,000*l.* The college has a frontage to Clarence-street and Pleasant-street, with an entrance for female students from each of these streets. The male students' entrance is from Green-lane. The main elevations are executed in buff terra cotta and pink brick of specially selected tints. Adjoining the college in Clarence-street is the principal's residence, now in course of erection. The class-room accommodation provided is for 560 students on the ground and first floors. This is exclusive of the science department, which, with the art class-room, occupies the whole of the top or second floor. The lowest floor is a half-basement, containing a tea-room 58 ft. by 24 ft., a recreation-hall, accommodation for cloaks, lavatories, &c., store-room, heating apparatus, &c. There are separate entrances and staircases for female and male students, giving free exits and entrances. One of the female students' entrances is from Pleasant-street, and communicates both with the basement and ground floor. Another entrance will be from Clarence-street, incorporated with the principal's house. The class-rooms accommodate from thirty-five to sixty students each, and two pairs of fifty can be thrown together by sliding glass partitions. The science department contains a chemical laboratory, 60 ft. by 23 ft., giving accommodation for forty-eight students, with storage and preparation rooms, balance-room, and science teachers' room in connexion therewith. There is also a lecture and examination room, 51 ft. by 25 ft., divisible by a roller screen. The art class-room is 37 ft. by 23 ft. An office for the principal commands the entrance for the female students from Pleasant-street. The artificial lighting is by electric incandescent lamps suspended in clusters of three. The rooms are heated by hot water pipes, and the corridors by means of radiators on the low-pressure system. Open fireplaces are also provided. The buildings have been designed and erected under the supervision of Messrs. T. Mellard Reade & Son, architects, Liverpool, and the work has been carried out by the late Mr. Samuel Webster, Bootle.

**UNDERGROUND LAVATORIES, BIRMINGHAM.**—The construction of underground lavatories, &c., in High-street (Bull Ring) and Corporation-street (Old-square) has been commenced by the Birmingham Public Works Committee. In each case there will be a department for ladies. The larger of the two lavatories is that which is being provided on the open space between the Nelson statue and St. Martin's Church. The total cost of the two buildings will be about 4,000*l.*

**VICTORIA CLOCK TOWER, RIPON.**—The Victoria Clock Tower, Ripon, has been erected at the junction of the Palace and North-roads. The building has been erected from the designs of Mr. George Corson (Messrs. Corson & Jones, architects, Leeds). The structure is 10 ft. square, and rises to a height of 43 ft., culminating in a Crown Imperial in copper. At the angles are four octagonal buttresses, which rise above the parapet in pinnacles, with carved finials and crockets. From these spring four flying arches or buttresses, and from four smaller pinnacles, corbelled out over the dials, spring other four. These eight unite in a keystone or carved boss, which carries the stone terminal on which the Crown Imperial rests. There are four dials enclosed within circular moulding within squares, the spandrels carved. On the stage below that of the clock the statue of the Queen occupies a canopied niche on the side fronting the city. Her Majesty is represented in a sitting position, the statue, as well as the rest of the carving, having been executed by Mr. Milburn, of York. The Royal Arms, the arms of the diocese of York, and those of Ripon occupy the other sides. The stone used in the building is from the Dunhouse Quarries, near Darlington, the builders being Messrs. W. Wilson & Sons, of Headingley. Messrs. Potts & Sons, of Leeds, have provided the clock, with its four illuminated dials.

**STATION HOTEL, INVERNESS.**—Alterations and additions have just been completed at the Station Hotel, Inverness, for the Highland Railway Company. Messrs. Ross & Macbeth, of Inverness, were the architects. The alterations for the various departments of the work of renovating the hotel were—Mason, Thos. Macdonald; carpenter, William Macdonald; plasterers, Fowler & Kennedy; plumbers, Black & Son; painter, Thomas Tulloch; heating, Mackenzie & Moncur, Edinburgh; inspector of works, Mr. J. Ross, Inverness.

**NEW BRIDGE, SHEFFIELD.**—The Corporation of Sheffield propose to construct a new bridge over the River Don at Ball-street, Sheffield. The bridge will be of arched steel girders on stone piers, and the plans and quantities have been prepared by Mr. Charles F. Wike, the City Engineer. The tender of Messrs. Braithwaite & Co., of Leeds, amounting to 9,087*l.* 15*s.* 4*d.*, has been accepted.

**THEATRE, BIRMINGHAM.**—The foundation-stone has just been laid of the new theatre in the Birmingham road, Dudley. The theatre is estimated to cost over 10,000*l.* Mr. A. Ramsell is the architect, and Messrs. J. H. Whittaker & Company are the contractors.

**HOTEL OSBORNE, MAYFAIR.**—A site has been taken on the east side of Berkeley-street for a new hotel to be built in connexion with the Princes Hotel at Brighton. The architects are Messrs. J. T. Wimperis & Arber, and the premises will overlook the gardens of Devonshire House, Piccadilly, and Lansdowne House, Berkeley-square.

**MARYLEBONE WORKHOUSE.**—The old block of buildings facing Marylebone-road is being dismantled to make room for a fresh extension of the workhouse which will be erected after the plans and designs of Mr. A. Saxon Snell. The parish workhouse and infirmary were built on the present site in 1775, the frontage being set back from the New, now Marylebone, road, as laid out in pursuance of the Act, 29 Geo. II., c. 88, of 1756, which prohibited the erection of buildings in that thoroughfare within 50 ft. from the roadway.

**BRADFELD COLLEGE.**—The Council invite subscriptions for the completion of the chapel, of which the western portion was built in 1892, after Mr. J. Oldrid Scott's plans and designs. The original design provides for a capacity of 450 persons, and it is hoped that a sum of 5,000*l.* will be collected and the building be finished before July, 1900, the fiftieth anniversary of the founding of the school.

**THE BIRKBECK BANK.**—The directors have secured the site and buildings of Nos. 326-32, High Holborn, next east to Middle Row-place, for the frontage of an extension of their new buildings which have been erected, and are now nearly completed, after the plans and designs of Mr. T. E. Knightley, the terra-cotta work being from Messrs. Doulton's. A conspicuous feature of the plan is a spacious rotunda, to serve for public banking purposes, decorated with paintings, and having a gallery, resting upon massive brackets covered with glazed pottery-ware around the base of the dome; provision is made for surrounding with water the dead-room in the basement. A reference to the text and illustrations of a recent article in our columns\* will show that the High Holborn portion of the bank will occupy in part the site of Southampton House, formerly the town inn of the Bishops of Lincoln, who bought it from the Temples.

**TECHNICAL SCHOOL AND FREE LIBRARY AND MUSEUM ADDITIONS, LIVERPOOL.**—Sir William Forwood, chairman of the Library, Museum, Art, and Technical Instruction Committee of the Liverpool City Council, laid the foundation-stone, on the 1st inst., of an addition to the range of buildings (the Brown Library and Museum, the Pictorial Reading Room, and the Walker Art Gallery) on the north side of William Brown-street in that city. The new structure, which is estimated to cost the Corporation close upon 100,000*l.*, will provide additional accommodation for the museum besides a central technical school. The three lower floors, reached from a separate entrance in Byrom-street, will be devoted to the purposes of the Liverpool School of Science, Technology, and Art. In the basement will be rooms for practical instruction in electricity, engineering, and various other technical subjects. Above this will be a lecture-hall, capable of accommodating nearly 400 students, besides class-rooms for various subjects, and the necessary administrative offices. On the floor above this again will be a number of other class-rooms, adapted for instruction in mathematics, building construction, &c.; and in a cross gallery on a higher level (isolated from the other portion of the school) will be a chemical laboratory and lecture-room. Mr. E. W. Mountford is the architect. For illustrations of the additions, see our issues for August 8, 1896, and January 2, 1897.

**CLOCK TOWER, IRTHINGTON CHURCH.**—New church tower, clock, and bells have just been dedicated at Irtlington Church by Bishop Barrow, who also consecrated an addition to the churchyard. The tower is in the Late Gothic style, and is provided with a clock. It is about 60 ft. in height and about 17 ft. square. Mr. Taylor Scott, of Carlisle, was the architect. The tower has been erected of red sandstone, from the parish quarry of Three Horse Shoes. The five bells were cast by Messrs. John Warner & Sons, London. The clock has been constructed by Messrs. Wm. Potts & Son, of Leeds and Newcastle. The work has been carried out by Mr. Robt. Mark, builder, of Laversdale; the oak-work and general joiners' work by Mr. William Edger, of Brampton; plumbers' work and lead lights by Mr. William Anderson, of Carlisle; and painters' work by Messrs. Atkinson & Elliot, of Brampton. Mr. J. F. Harriman, of Carlisle, has been clerk of works.

**ALTERATIONS TO THE THEATRE ROYAL, JARROW.**—Internal alterations and improvements have just been carried out at the Theatre Royal, Jarrow. The entire building has been gutted. The pit has been lowered some 12 ft., so as to bring it to the ground level. The auditorium is 53 ft. long by 45 ft. wide and 37 ft. high. The stage is 47 ft. by 30 ft., while the proscenium arch is 22 ft. wide by 23 ft. in height. Eight dressing rooms have been provided. In the pit and stalls there is accommodation for 700 people, in the boxes for 350, and in the gallery for 500, making a total seating accommodation of 1,550. There are four private boxes, two on either side of the stage. The building is heated throughout by means of hot water. The architects

\* "The Patent Office Buildings and their Site," April 9, 1898, pp. 342-4, ante.



have been Messrs. James Henderson, jun., and John Hall, of Sunderland; Mr. J. S. Earnshaw, of Sunderland, has been the general contractor; and Mr. W. R. Dodds, of Jarrow and Newcastle, has been responsible for the decorative plaster work.

**BRANCH LIBRARY, BALHAM.**—The Balham Branch Library, erected by the Streatham Public Libraries Commissioners, is situated in Ramsden-road. The first portion, which has just been opened, consists of reading room and a lending department. It is intended to extend the building subsequently by erecting a large lending library behind the present structure. The architect is Mr. Sidney R. J. Smith, and the contractor is Mr. Walter Wallis, of Balham.

**CLEVELAND ASYLUM, MIDDLESBROUGH.**—This building, which has been erected in Marton-road, Middlesbrough, was recently opened. The cost of the asylum has been about 100,000. The entrance is from Marton-road, whilst for the delivery of goods by rail a siding has been provided on the Middlesbrough and Guisborough branch of the North-Eastern Railway, which railway forms the boundary to the estate on the north-east side. The wards in the present buildings provide accommodation for 250 patients, 125 of each sex. The administrative offices, which are designed to admit of the asylum being extended to accommodate 150 more patients, are placed centrally, with the patients' blocks on either side. They comprise the official block, recreation hall, kitchen offices, steward's stores, and bakery. The official block, or front offices, is a two-story building, placed centrally in the front. Immediately to the rear of the front offices are the visiting-rooms, dispensary, and chaplain's room and library. The recreation hall is 60 ft. 4 in. by 30 ft. 9 in., with a stage 35 ft. 0 in. by 15 ft. At the back of the stage there are two dressing-rooms. Separate approaches are provided to the hall from either side of the building, besides which there are additional emergency exits. Between the hall and the kitchen offices are a serving-room and scullery. The steward's stores are at the back of the administrative offices, and extending under the main store is a cellar. As in the kitchen offices, provision is made for separate service to either side of the building. Abutting on the stores is the goods delivery yard, at the entrance to which is the weighbridge. The bakery adjoins the stores delivery yard. The patients' blocks are placed to the right and left of the administrative offices. The blocks comprise four wards on each side, being duplicates of each other. Each of the wards is self-contained, and is worked independently of the others. All the day rooms have southerly aspects, whilst the whole of the dormitories are cross ventilated. The water-closets and other sanitary fittings are placed in spurs, shut off from the wards by cross ventilated lobbies. The staircases provide two exits from each ward in case of fire. At the back of the male wards, and looking into an inner court, are the tailors', shoemakers', and upholsterers' workshops, and at the rear of these workshops are the builders' workshops, comprising shops for carpenter and joiner, smith and plumber, painter and glazier, and foreman's office. On the female side in a corresponding position to the builders' workshops is the laundry. The general laundry contains a wash-house, ironing-room, drying closet, receiving rooms, and distribution rooms. At the back of the general laundry is a foul linen wash-house with separate drying room. Adjoining the general laundry is the officers' laundry, consisting of wash-house, ironing room, and drying closet. Adjoining the laundry is an open asphalted drying-ground. Separated from the laundry by the covered way is the serving-room and main store, and cutting-out room. At the back of the laundry is the boiler-house block. The superintendent's house is practically a detached building, being only connected to the main building by a narrow corridor. The detached hospital for the treatment of infectious cases provides accommodation for ten patients, five of either sex, with the necessary rooms for the nurses and caretaker. The kitchen offices and laundry are placed centrally at the back of the wards. The chapel is detached, and consists of a nave, chancel, organ-chamber, and vestry. It affords sitting accommodation for 204. The farm buildings are situated between the main buildings and the hospital. The garden buildings are placed in the kitchen-garden. The mortuary is a detached building. Lodges are provided at the front entrance to the asylum grounds, and at the entrance to the yard for the delivery of stores. The whole of the wards and other portions of the buildings occupied or used by the patients and staff are, in addition to open fireplaces, heated by hot water on the low pressure principle. The work has been carried out by the following contractors, viz.:—Excavator, bricklayer, and mason, Messrs. Bastiman Bros., Middlesbrough; carpenter and joiner, Mr. R. T. Smith, Darlington; smith and plumber, Messrs. Baker Bros., Middlesbrough; slater, Mr. J. Harrison, Middlesbrough; plasterer, Mr. J. R. Smith, Middlesbrough; painter, Mr. A. Lewis, Middlesbrough; glazier, Messrs. G. Lambert & Son, Middlesbrough; fireproof construction, &c., Jones's Annealed Concrete Company, Middlesbrough; staircases, &c., Messrs. Crombie & Son, Middlesbrough; heating and ventilation work, Messrs. G. N. Haden & Son, Trowbridge; laundry engineers' work, Messrs. T. Bradford & Son, Manchester; cooking apparatus, Messrs. Moorwood, Sons, & Co.,

Sheffield; locksmith, Mr. J. Gibbons, Wolverhampton; skylight and ventilator opening apparatus, Messrs. W. & R. Leggett, Limited, Bradford; oven builder, Messrs. H. Smith & Son, Lambeth; dispensary fittings, &c., Messrs. Punch Bros., Middlesbrough; stage fittings, Messrs. Lithgow & Story, Middlesbrough; telephones, tell-tale, &c., Messrs. Smith, Darlington; fencing, Messrs. Hill, Brerley Hill, Mr. E. A. Jones, Linthorpe, Middlesbrough, was the clerk of the works. The architect was Mr. A. J. Wood, of London.

**VICTORIA TOWER, HUDDERSFIELD.**—On the 25th ult., the foundation-stone was laid on Castle Hill, Huddersfield, of the new tower to be erected to commemorate the Queen's long reign. The tower will rise to a height of 105 ft., the highest point to which the public will have access being 100 ft. The basement is to be used as kitchen, storeroom, and lavatory. The principal entrance is on the ground floor, which will be approached by a flight of steps, and gives access to the hall, from which the stairs ascend to the fourth and intermediate floors. Windows are opened out at all points of vantage on the stairs and landings, as well as in the rooms for obtaining views. Seats are provided wherever a convenient position offers. The quantities were supplied by Messrs. Abbey & a son, of Huddersfield, whom the Building Committee have appointed to superintend the erection. The contractors are Messrs. Ben Graham & Sons, of Huddersfield.

**LODGING HOUSE, EDINBURGH.**—A new "Jubilee" lodging-house has just been erected at the corner of Grassmarket and King's Stables-road, Edinburgh. The building will have accommodation for about 500 beds. A reading and recreation-room is provided for the inmates, while the roof of the building is adapted as an open-air promenade. In connection with the lodging-house there will be six shops, each communicating with the dining hall, and having a frontage to Grassmarket and King's Stables-road. In addition to the main staircase, from each of the dormitories an emergency door is introduced into the staircase of the adjoining block. Tiles and enamelled brick have been largely used in the construction of the lavatories, dining-hall, stairs, &c., being lined or floored with these. The buildings are six stories in height, and on the basement will be placed the laundry. The building throughout will be fitted with electric light. The style of the building is Castellated Baronial. The work will cost over 12,000, and has been designed by and carried out under the supervision of Mr. J. W. Maclean, architect, Edinburgh.

**POST OFFICE, PERTH.**—The new General Post Office for Perth, which has been in course of erection during the last eighteen months, has just been opened. The style is a free treatment of the Renaissance. At the corner rises a tower 100 ft. high. The principal elevation is to the High-street, with a height of three stories; the elevation to the New-street being only one story high. The main entrance is situated at the base of the corner tower, there being also a private entrance in High-street, and a postmen's and mail entrance in the New-street. On the ground floor is the public office. Entering from the public office are the chief clerk's room and an apartment for public telephone boxes. Adjoining the public office are the sorting rooms and the dining-office. This department has accommodation for twenty sorters and forty postmen. Along the south and east sides of the sorting office are the postmen's retiring room and lavatory, storeroom, strong-room, basket-room, &c. Entering from the New-street at the corner tower, the large hall in which the mails may be received or despatched. The staircase is situated at the north-east corner of the High-street, and behind it is the telegraph delivery room, which is connected by a pneumatic tube with the instrument room on the second floor, and from which telegrams will be despatched. There is also a private stair from this floor into an inspection chamber, where officials can overlook the whole of the sorting room entirely unseen. In the basement are situated the furnace room, linesmen's room, mechanic's room, telegraph engineers' storeroom, and the battery room. On the first floor are the Postmaster's room, retiring room for male clerks, storeroom, and spare accommodation. On the second floor are situated the women's retiring-room, telephone-room, and the telegraph instrument room. The building is heated throughout by hot water. The architect is Mr. W. W. Robertson, H.M. Board of Works Office, Edinburgh.

#### STAINED GLASS AND DECORATION.

**WINDOW, WINCHESTER CATHEDRAL.**—The Jubilee Memorial Window in the Lady Chapel of Winchester Cathedral is completed. The design and execution are by Mr. Kempe.

**MEMORIAL WINDOWS, CHRIST CHURCH, BLACKPOOL.**—Memorial windows have just been erected in the north-east side of Christ Church, Blackpool, to the memory of the late Mr. Henry Herbert Wainwright, and his mother the late Mrs. Wainwright. The windows are the work of Messrs. Alex. Gibbs & Co., of London. They have been put in by Mr. John Coulston, of Blackpool.

**STAINED WINDOW, EAST CHURCH, PERTH.**—There is in course of erection in the East Parish Church, Perth, a stained-glass window presented by

Miss Bower. It is in the north-west corner, and consists of three panels with tracery above. The centre panel is a figure of John the Baptist. To the left is a representation of Elizabeth, and to the right is a figure of Zacharias. The window is the work of Messrs. Stephen Adam & Son, Glasgow.

**MEMORIAL WINDOWS IN THE TRON CHURCH, EDINBURGH.**—Two compartments of a three-light window under the south gallery of the Tron Church have just been filled with stained glass. In the central light is represented a figure of Moses, bearing the two tables of stone and the rod. The light to the left side represents the figure of David, with one hand resting on the harp, and the other holding a scroll, upon which is inscribed a quotation from the Book of Psalms. The windows were executed by Messrs. Ballantine & Gardiner, Edinburgh.

**ORGAN, ST. MARGARET'S CHURCH, PRINCES ROAD, LIVERPOOL.**—This organ in this well-known church has just been decorated, at a cost of about 100, by Messrs. Bacon Bros., of London.

**A MEMORIAL TO JANE AUSTEN.**—It is proposed to fill with painted glass, to be executed by Mr. C. E. Kempe, one of the windows of Winchester Cathedral, as a memorial of Jane Austen. It is stated that the cost of a window in the nave is estimated at 300; of one in the Lady Chapel, 600. The greater part of Jane Austen's life was passed in the county; and she died at Winchester on July 24, 1817, and was buried in the cathedral. As we have previously observed, however, we fear that a stained-glass window is hardly a kind of memorial that Jane Austen would have appreciated.

#### FOREIGN.

**FRANCE.**—The new buildings of the Palais de Justice at Paris, by M. Daumet, have just been inaugurated. They comprise a large audience chamber opening on the gallery of the Sainte Chapelle, a robing-room, and a large gallery at right angles with the prisoners' gallery, and which divides the whole building into two portions. M. Labrousse has been elected President of Comitee of the Union Syndicale des Architectes Français for 1898-99. There is talk of doing away with the old Salpêtrière Hospital, in order to replace it by a new one built and fitted on modern lines. M. Brébant, the architect of the Pasteur Institute, has been commissioned to make the plans for a large Institute of Biology in Rue Dutot. The Municipal administration of Paris is organising periodical and public visits of inspection to the new sewage irrigation area at Acheres, near the forest of St. Germain. M. Lenepeux, professor of drawing at the Ecole des Beaux Arts, has been obliged to resign on account of ill-health. The death is announced of M. Auguste Loutstaunau, a well-known painter of military and genre subjects. He was the pupil of Gérôme, Barrias, and Vibert. A great many of his works have become popularly known through engravings.

**AUSTRIA.**—Arrangements are being made for the erection of a great ice factory at Vienna. The project has long been discussed, and the warmth of last winter, together with the increased price of ice, has brought the matter to a head. An examination of different processes of ice manufacture has been held, with the result that the system of Messrs. Riedinger, of Augsburg, in which carbonic acid is employed, has been adopted. An industrial hall, erected to commemorate the Imperial Jubilee, from the designs of Herr A. Gurlich, of Vienna, has just been opened at Steyr. A large site has been selected at Buda Pesth for the erection of a central poorhouse, to cost over a million florins. The statue of the Emperor was unveiled at Weisskirchen on the 26th ult. It is the work of Herr Emanuel Pendl, of Vienna. In the middle of the sixteenth century the Church of St. James at Izlau was destroyed by fire and rebuilt. An effort is about to be made to restore it to its original form, which is recoverable so far as the presbytery, the greater part of the nave, and the entrances.

#### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Mr. Robert Williams, architect, has removed from 17, Effingham-road, Lee, to 20, Northbrook-road, Lee, London, S.E.

**ALTAR, ST. PATRICK'S CHURCH, KILNALECK, COUNTY CAVAN.**—There has been erected a side altar, dedicated to the Sacred Heart, in the Catholic Church, Kilnaleck, county Cavan. The body of the altar is composed of Caen stone and different coloured Irish marbles. The design and plans were made by Mr. C. J. Taylor, architect, of Dublin and U.S.A. The sculptor's work was carried out by Messrs. Taylor & Sons, of Dublin.

**APPOINTMENT.**—At the last meeting of the Metropolitan Asylums Board, Mr. W. T. Hatch was appointed Engineer to the Board.

**NEW ROYAL ACADEMICIAN.**—Mr. E. A. Abbey, A.R.A., has been elected to the full honours of R.A., a choice which we suppose the whole artistic world will ratify. In Lear's picture in the present Academy furnishes the most suitable comment on the election.

**OPEN SPACES.**—It is stated that the Corporation of Scarborough have bought for 33,000, from Mr. John Woodall the property known as St. Nicholas



House, that the house will be adapted for municipal purposes, and that the gardens, which contain an interesting collection of plants, will be preserved for the public enjoyment. The long outstanding negotiations for an extension of the Postmen's Park, Little Britain, are, it seems, now brought to a successful termination. The Vicar and Churchwardens of St. Botolph, Aldersgate, have agreed to purchase from the City Parochial Trustees the adjoining plot of land in Little Britain on the terms that the western portion should be conveyed to them on the present payment of 6,000*l.*, and that the eastern portion be handed over to them on the payment, before June 24, 1900, of a further sum of 6,000*l.* The subscriptions in hand are sufficient to meet the former payment, but about 3,000*l.* are still needed to complete the purchase of the land in its entirety.—The burial ground in the rear of the "Robert Browning" Settlement Hall, Walsworth, was opened a few days ago. It covers about half an acre, and has been converted into a garden with the aid of a grant made by the Metropolitan Public Gardens Association, and a subscription of half the total cost, by Mr. John Newbery, of Whiteleaf. Mr. H. Doultton has presented a drinking-fountain in memory of his father, the late Sir Henry Doultton, of Lambeth. The name of the garden commemorates the circumstance that Robert Browning (born on May 7, 1812, in the parish of St. Giles, Camberwell) was baptised on June 14, 1812, in the adjoining York-street Independent Chapel, tattered used for mission purposes. His mother's name is included in the first list (1800) of members of the congregation.—It is announced that a syndicate of the residents of Chelsea have decided to sum of 33,000*l.* for buying the house and estate, seventy acres, for purposes of golf-links and a club-house, which was the home of Napoleon III., who died there in 1873, and for some while afterwards of the Empress Eugénie and their son, the late Prince Imperial. Camden Place was originally built by Camden, the antiquary, and head-master of Westminster, who died there in 1623. In 1765 Lord Chief Justice Pratt was elevated to the peerage as Lord Camden of Camden Place, and advanced Earl Camden in 1786. His son sold the property to Mr. Lushington, and it was subsequently occupied by Prince Esterhazy, the Austrian Ambassador.

**FEDERATION OF MASTER BUILDERS OF GREAT BRITAIN.**—A meeting of the Executive Council of the Midland Centre of this Federation was held on the 29th ult. at the offices of the Nottingham Master Builders' Association. Twenty-two members were present, representing the counties of Derby, Nottingham, Lincoln, Salop, Stafford, Worcester, Warwick, Leicester, Rutland, Northampton, Huntingdon, Flint, Denbigh, Carnarvon, Anglesea, Merioneth, and Montgomery. The President (County Alderman John Bowen, of Birmingham) occupied the chair. Reports from the Lancashire and Cheshire Branch of the National Federation relating to the strike of stonemasons, the lock-out in that district, and the present strike in Nottingham were received and discussed. It was felt desirable that the local strike should, if possible, be amicably settled before the July meeting of the General Council in order to avoid the danger of further and more extensive complication and disturbance in the trade.

**THE STRAND IMPROVEMENT SCHEME.**—On the 29th ult. at the Surveyors' Institution, Savoy-street, Mr. J. Green held an inquiry to determine the value of the property proposed to be included in the betterment area of the Strand Improvements. The London County Council, by their Act of 1897, proposed to widen the Strand by the removal of the south side of Holywell-street, and the "betterment" or improvement area under the Act includes the lands, all or any part of which front or abut upon the northern side of Holywell-street. Several cases were agreed upon, and the case of 31, Newcastle-street, a refreshment house, was considered. The house was held under a lease expiring in 1908, at 160*l.* per year, and sub-let for the remainder of the term at 275*l.* Witnesses fixed the value at 6,722*l.* to 7,135*l.*, whilst the value of the County Council thought twenty-two years' purchase at 275*l.* per annum was a very fair value. Mr. Wilkinson, surveyor, agreed with the valuation, and the referee reserved his decision. The proceedings were continued on Thursday, and subsequently adjourned.

**THE ENLARGEMENT OF WATERLOO STATION.**—Mr. A. de Tatton Egerton presided on the 4th inst. over the Select Committee of the House of Commons appointed to consider the Omnibus Bill of the London and South-Western Railway Company. The principal provision of the measure, which had already passed the House of Lords, consisted of a scheme for the enlargement of Waterloo Station, but Lord Robert Cecil, in opening the case for the promoters, explained that since the measure was approved by the Upper House it had been found necessary, at all events for the present, considerably to diminish the area of the enlargement originally contemplated, and in accordance with the plan the station would have been extended to Waterloo-road on the west side, and as far as Lower Marsh on the north side. Mr. Pope, Q.C., for the London County Council, protested against the alteration of the original scheme. They quite acknowledged the public necessity for an enlargement of Waterloo Station, and therefore had not opposed the Bill as it was brought into the other

House, because it would, if carried out as then designed, have brought about several public improvements in the neighbourhood of Lower Marsh.—After the Committee had deliberated in private, the Chairman announced that they considered the preamble of the Bill, so far as it referred to the enlargement of Waterloo Station, was not proved. It was not only not the same scheme that had been sent down from the other House, but it was in itself, as now presented, an ill-considered scheme. Of course, the unopposed portions of the Bill, relating to new lines in Devonshire and elsewhere, would be allowed to proceed.

**FONT, ST. MATTHEW'S CHURCH, COCKINGTON.**—On the 1st inst., at St. Matthew's Church, Cockington, the new font and baptistry were unveiled and dedicated. The architect is Mr. C. Nicholson; an illustration of the font appeared in our issue for July 3, 1897.

**WESLEYAN METHODIST CHURCH, DARLINGTON.**—On the 29th ult., the memorial stones were laid of a new schoolroom, which is being erected by the Darlington Wesleyan Methodists. The whole scheme comprises a schoolroom, 54 ft. by 36 ft., and a chapel to be erected on a site opposite the end of Easson-road, which has a frontage of about 100 ft. The schoolroom now in course of erection is intended to seat 350, and will be used as a chapel until the accommodation is too small, when the chapel, to seat 800, will be erected on the east side. There is to be a porch entrance facing St. Luke's terrace. The total length of the building, including cellars behind, will be 70 ft., and the total width 30 ft. In addition to the main entrance, two others are to be provided, one on the west side and one in the rear. The main entrance, which is to be erected now, will be a temporary one, it being intended at a later period to erect a two-story building in front of the school, containing classrooms, vestries, &c. Mr. W. J. Morley, of Bradford, is the architect, and the contractors are Messrs. Robt. Kitching & Sons, for brickwork, joinery, and plastering; Mr. John Law for painting; Mr. John Wandless for slating; and Mr. T. Lishman for plumbing.

## CAPITAL AND LABOUR.

**THE THREATENED LOCK-OUT OF MASONS, LIVERPOOL.**—The monthly meeting of the Liverpool and Vicinity Trades and Labour Council was held on the 29th ult. at the Mitre Hotel, Dale-street. Mr. T. A. Woods presided. Mr. Cooper (President of the Operative Stonemasons' Society) put before the council the case for the Liverpool masons with regard to the dispute between the employers and operatives in Lancashire and Cheshire. He said that although there was no dispute between the Liverpool masons and the Liverpool employers, the latter had posted notices of a lock-out in Liverpool in support of their fellow employers outside. In view of the impending lock-out, the Liverpool employers were endeavouring to get their clients to ignore the penalty clause in contracts. He asked the council to support the society in urging the Corporation and other building employers to insist upon obedience to the contract. A resolution was carried instructing the secretary to write to the Town Clerk of Liverpool and other building authorities urging that the penalty clause in building contracts should be enforced.

**BRISTOL BUILDING TRADES.**—For some weeks past the Bristol Master Builders' Association have been considering a demand made by the employees in various branches of the building trades for an advance of wages and alteration of the working rules. Meetings have been held, and negotiations have also been conducted by correspondence, until, so far as the federated trades are concerned, the points in dispute have been narrowed to two, viz., the date at which the advance shall come into operation, and the rule with reference to "walking time." The last communication from the Federated Trades, dated June 28, contained a suggestion to refer the two points to arbitration. A fully-attended meeting of the Master Builders' Association was held on the 29th ult., and the result was that a letter was addressed to the Federated Trades by the secretary (Mr. H. J. Spear) containing the following:—"As there does not appear to be any possibility of arranging the two points at variance between this Association and the Federated Trades, I am desirous to inform you that the members of this Association are prepared to act upon your suggestion to refer these two points to arbitration, and that such arbitration shall be through the medium of the Board of Trade under the provisions of the Conciliation Act of 1896." Mr. Spear suggests in his letter that two members of the Federated Trades shall meet two members of the Master Builders' Association for the purpose of determining upon what lines the Board of Trade shall be approached, and he adds that of course it is understood that the award of the Board of Trade shall be final and binding on all parties. A copy of the letter has been sent to the Bricklayers' Society and to Mr. J. Curle, Secretary of the Bristol Trades' Council. We are also informed that all the federated trades, with the exception of the masons, met on the 29th ult., and communicated with the Master Builders' Association to the effect that they will agree to the points being submitted to arbitration,

and that they will continue work until the award of the Board of Trade arbitrator is given.—*Western Press.*

**THE JOINERS' DISPUTE, MIDDLESBROUGH.**—The Master Builders' Association have conceded one halfpenny per hour advance to the joiners of Middlesbrough. This is the amount asked for, and makes the Middlesbrough rate 9d. per hour, to take effect from July 4.

**JOINERS' WAGES, SUNDERLAND.**—The joiners in the building trade in Sunderland have received an advance of wages. The rate previously was 9d. per hour, and it has now been increased to 9½d.

**MASONS' WAGES, GREENOCK.**—The master builders of Greenock district have agreed to fall into line with the Glasgow employers and grant an increase of ½d. per hour, making 9½d. in all. This is to take effect on August 1.

**THE DISPUTE IN THE NOTTINGHAM BUILDING TRADE.**—It is satisfactory to report that in regard to several matters of importance relating to the Nottingham building trade, difficulties which threatened to be of a formidable character have to a certain extent been adjusted, and it is anticipated that the deadlock which prevails in one or two branches will before long be entirely removed. It will be remembered that originally the matter emanated from the demand of the labourers for an advance of ½d. per hour, which has brought in its train a cessation of work on the part of the bricklayers. The notices tendered some months ago by the members of the Stonemasons' Society have expired, but the points have been satisfactorily settled. An extra ½d. per hour has been conceded to the workmen, who, on their part, have made certain concessions in relation to the working rules, particularly as affecting apprentices. An amicable understanding has been arrived at between the bricklayers and the employers, but the men are still "out" pending the settlement of the labourers' strike. A special general meeting of the Nottingham Master Builders' Association took place on the 2nd inst., when the position of affairs in regard to the labourers' strike was taken into consideration. Several of the bricklayers' labourers have returned to their employment, but approximately there are still about 500 out.—*Nottingham Guardian.*

**THE CARPENTERS' STRIKE AT NEWPORT.**—The carpenters' strike at Newport has been settled. The men have accepted the proposal to return to work under the old rules, but not to continue working after five o'clock. This arrangement will remain in force until May next. If they so desire, however, the men may give notice in September to terminate the agreement in May.

**SWANSEA MASONS' STRIKE.**—There is no fresh development in connexion with the Swansea masons' strike. The men's offer to work at 8½d. per hour up to January, 1899, when the 9d. is to be given, is still open, but has not yet been accepted by the employers.

## LEGAL.

### THE LONDON BUILDING ACT.

At the North London Police-court, on the 29th ult., Mr. Frederick Meeson, one of the District Surveyors of Hackney, was summoned before Mr. d'Eyncourt, at the instance of Mr. James Watt, a builder, to show why his objection to a certain building in Mabley-street, Hackney Marshes, should not be overruled.

Mr. Milner-Judson appeared in support of the summons, and explained that Mr. Watt was engaged in developing an estate, which was at present rough grass land. A cinder path marked a proposed roadway, which was in the form of an acute angle, or crescent. At one end of the proposed roadway a house had been built and set back about 30 ft. from the centre of the roadway. Mr. Watt started building at the other end of the roadway, and he had only set back 20 ft. from the centre of the road. Mr. Meeson objected under Section 150 of the London Building Act, 1894, on the ground that the second Mabley-street. Mr. Milner-Judson pointed out that the Act referred to the general line of frontage in a street, or "part of a street." He contended that this at the present time was not a street at all, and, further, the Act was not intended to apply to entirely new thoroughfares like this. If Mr. Meeson's contention were correct it would be possible for one man to destroy the value of his neighbour's land. He might build a house 50 ft. back from the centre of the road, and all the other owners would have to follow his example.

Mr. d'Eyncourt, who had viewed the building in question, said that his own opinion was that the Act was only intended to apply to buildings put up in an already existing street, and not to an absolutely new thoroughfare. The two portions of Mabley-street were alike only in name. He therefore overruled the objection of the District Surveyor.

Mr. Milner-Judson asked for costs.

Mr. Meeson hoped the magistrate would not grant costs, as these proceedings were taken in the interest of the builder.

Mr. d'Eyncourt: On your objection.

Mr. Meeson said that was so, but the magistrate's decision gave Mr. Watt a free hand to proceed with







By DEBENHAM, TEWSON, & CO. Mayfair—51, Charles-st., f. r. 450l. .... 4,000 Snashbury—Snashbury-road, "Bunton House and a o. r. 24 p. f. .... 2,300 Ripe, Sussex—"Ripe Manor House" and 40 a. 2 7 p. f. and c. .... 1,100 West Africa—Four concessions, 100 a. each, in the Gold Coast, for 99 yrs., at rentals amounting to 500l. per annum. .... 2,900	By C. W. DAVIES. Regent's Pl.—4 and 7, Hanover-pl., u. 24 yrs., g. r. 27, r. 187. .... 1,035 Marylebone—226 and 228, Great Portland-st., u. t. 11 yrs., g. r. 124, r. 134. .... 845 Belgrave—74, Ebury-st., u. 25 yrs., g. r. 84, r. 120. .... 1,130 Stoke Newington—168, Stoke Newington-rd., u. t. 70 yrs., g. r. 204, r. 100. .... 810 Islington—368, Essex-rd., u. 13 yrs., g. r. 74, 78, r. 90. .... 1,000 Hoxton—31, Ecclesbourne-rd., u. 44 yrs., g. r. 67, r. 361. .... 310 Barnaby—19, 11, and 12, Charles-st., u. 45 yrs., g. r. 184. .... 525	Hopton, Suffolk—"Bees" or "Holly Tree Farm," 172 a. o. r. 6 p. f. .... 4,650 By WARRICK & CO. (at Clebury Mortimer). Barton, Salop—"Mill Farm" and colliery, 65 a. 1 r. 18 p. f. .... 1,150 Clebury, Salop—"A freehold house and o. a. 3 1/2. .... 111 A freehold building site, 2 a. 1 r. 33 p. .... 100 June 23.—By PHIBBS, GILSON, & CO. Norwood—268 and 269, Thornhill-rd., u. 63 yrs., g. r. 144, r. 64. .... 600 By FERCIVAL HODSON. Harringay—38, Seymour-rd., u. 95 yrs., g. r. 61, 205, r. 444. .... 455 By HUMPHRIES, SKITT, & HUMPHRIES. Deptford—177 and 179, High-st., f. r. 150. .... 3,010 Lewisham—10, Lewisham Pl., u. 65 yrs., g. r. 134, r. 554. .... 570 By H. J. BLISS & SONS. Hackney—18, 20, and 27, Mansford-st., f. r. 104. .... 1,190 Marylebone—12 and 13, Hereford-st., u. 22 yrs., g. r. 404. .... 290 Bayswater—12 and 13, Coleridge-mews, u. t. 81 yrs., g. r. 144, r. 401. .... 170 Fulham—18 and 19, South-st., u. 45 yrs., g. r. 134, r. 554. .... 400 Old Ford—28, Hewlett-rd., f. .... 420 Bethnal Green—25, Collingwood-st., f. .... 270 By GLASIER & SONS. Putney—124, Upper Richmond-rd., f. 60. .... 1,590 St. Pancras—Burton-cres., i. g. r. 2204, 108, u. t. 84 yrs., g. r. 71. .... 1,030 Whitechapel—69, Chick-st., f. 504; also i. g. r. 374, 108, u. t. 20 yrs., g. r. 20. .... 580 By C. C. & T. MOORE. Whitechapel—11, 12, 13, and 14, Vine-cf., f. r. 104, 108, u. t. 20 yrs., g. r. 20. .... 1,510 St. George's East—18, St. George's-rd., u. t. 14 yrs., g. r. 20. .... 150 15, Artichoke Hill, u. t. 51 yrs., g. r. 204, r. 126, 25. .... 470 Mile End—25 and 26, South Grove, u. t. 60 yrs., g. r. 81, r. 324. .... 130 68, Mile End-rd., u. t. 21 yrs., g. r. 64, 108. .... 450 Old Ford—69, Totty-st., u. 34 yrs., g. r. 34, r. 70. .... 170 St. George's East—5, 6, 7, and 8, St. George's-rd., u. t. 20 yrs., g. r. 20. .... 470 By NEWBORN, EDWARDS & SHEPHERD. Barnaby—121, Richmond-rd., u. t. 11 yrs., g. r. 81, r. 454. .... 155 Leyton—24 and 26, High-rd., u. 89 yrs., g. r. 224, r. 1204. .... 1,240 Haverstock Hill—No. 138, u. t. 404 yrs., g. r. 94, r. 1204. .... 780 Islington—69 and 70, Essex-rd., u. t. 13 yrs., g. r. 187, r. 1024, 108. .... 200 101, Essex-rd., u. t. 21 yrs., g. r. 204, r. 484. .... 380 18, St. Thomas-st., u. t. 27 yrs., g. r. 54, r. 344. Holloway—2, Devon-st., u. t. 54 yrs., g. r. 54, 58, r. 344. .... 1,575 Barnaby—40, Thornhill-rd., u. t. 104 yrs., g. r. 104, r. 454. .... 170 By STIMSON & SONS. Islington—21, Essex-rd., f. r. 604. .... 1,170 St. Pancras—Euston-rd., f. g. r. 834, 158, rever- sions in 224 and 244 yrs. .... 4,160 Euston-rd., f. g. r. 5474, reversions in 30 and 33 yrs. .... 7,180 Chalton-st., f. g. r. 2864, 98, reversions varying from 214 to 344 yrs. .... 9,575 Church-way, f. g. r. 1454, reversions varying from 214 to 344 yrs. .... 4,260 By H. J. BROWLE. Norwood—156, Knight's Hill-rd., f. r. 484. .... 635 1, 2, and 3, Chapel-rd., with 20 a. of rear, f. r. 1274. .... 1,915 22 and 24, Chapel-rd., f. r. 547. .... 825 33 and 37, Thornhill-rd., f. r. 804. .... 1,120 220, 208, 210, and 212, Norwood, f. r. 1, 584, 98, g. r. 184, r. 184. .... 1,640 Shortlands, Kent—Mays Hill-rd., a plot of land, f. By BLACKFORD & SON (at South Molton). Knowstone, Devon—"Moortown Farm," 20 a. .... 3,380 1 r. 13 p. f. .... 400 By EDWIN EVANS (at Clapham Junction). Barnaby—24, Raiton-rd., u. t. 71 yrs., g. r. 71, r. 71. .... 360 Barnaby—22 and 24, Spencer-st., u. t. 66 yrs., g. r. 104. .... 490 18, Faverly-st., u. t. 66 yrs., g. r. 44. .... 420 55, 57, 59, and 61, Castle-st., u. t. 79 yrs., g. r. 244, 58. .... 1,030 101, Lavender-rd., u. t. 48 yrs., g. r. 54. .... 205 13, Surrey-lane, u. t. 54 yrs., g. r. 54, r. 304. .... 265 79, Mysore-rd., u. t. 92 yrs., g. r. 74, 108, r. 404. 21, Lavender-rd., and 2 and 4, Eater-rd., u. t. 50 yrs., g. r. 54. .... 770 Wandsworth—29 and 31, St. John's Hill-grove, u. t. 84 yrs., g. r. 124, r. 54. .... 400 30, Comyn-rd., u. t. 87 yrs., g. r. 84, 88, r. 54, 124. .... 410 22 and 54, Barchard-st., u. t. 904 yrs., g. r. 124. Clapham—2, Brandon-rd., u. t. 63 yrs., g. r. 94, 98, r. 484. .... 400 Balham—30, Rossett-rd., u. t. 754 yrs., g. r. 84, r. 324. .... 280 Usbridge, Middx.—High-st., "Homeleigh" and 2 a. o. r. 30 p. f. r. 1054. .... 2,140 37 and 58, High-st., f. r. 1,660. .... 1,660 London-rd., two cottages and 3 a. r. 16 p. f. .... 820 By T. LAVINGTON (at Devizes). Urchfont, &c., Wilts—"The Marsh Farm," 110 a. 1 r. 24 p. f. .... 1,910 By BLAKE & CARPENTER (at Crofton). Crofton—Bensham-lane, Bensham Manor House, and 2 a. r. 15 p. f. .... 4,500 By REBECCE BROS. (at Bournemouth). Bournemouth (near) Hants—"The Ford Estate," about 423 a. f. (in lots). .... 26,675 By E. J. GILBERT. St. Osyth, Essex—"The Ship" inn, c. .... 2,550 Clacton-on-Sea, Essex—"Beach House," f. .... 1,150 By BUCKLAND & SONS (at Windsor). Fifield, Berks—"Windsor-rd., a cottage and 2 a. r. 27 p. f. .... 970	Windsor-rd., two enclosures, 8 a. 1 r. 27 p. f. .... 4,570 Windsor, Berks.—Alexandra-rd., "The Prince Consort's" or "The Model Cottages," f. r. 604. .... 7,750 By MESSRS. SPREMAN (at Attleborough). Besthorpe, Norfolk—"The Blue Tile Cottages," a house and 3 a. r. 33 p. f. .... 338 By CHANCELLOR & SONS (at Richmond). Barnes—1 to 47 and 61 to 71 (odd), Archway-st., u. t. 83 yrs., g. r. 1074, 108. .... 4,850 1 to 63 (odd) and 2 to 46 (even), Thorpe-st., u. t. 83 yrs., g. r. 1914. .... 7,315 Richmond, Surrey—"Battenberg-rd., "Pine," "Lilac," "Birch," "Myrtle," and "Laburnum" Villas, u. t. 94 yrs., g. r. 134, 66. .... 1,000 June 24.—By E. HOLSWORTH. Dalston—81, Sandringham-rd., u. t. 68 yrs., g. r. 84, r. 654. .... 610 Barnaby—25, Richmond-rd., u. t. 52 yrs., g. r. 84, r. 504. .... 435 Holloway—19, Benwell-rd., u. t. 65 yrs., g. r. 84, r. 454. .... 420 Homerton—1 and 2, Bone-cottages, and workshop adjoining, u. t. 634 yrs., g. r. 44, r. 444, 45. .... 170 By KNIGHT, FRANK, & RUTLEY. Barnaby—27, Thornhill-sq., u. t. 47 yrs., g. r. 74, r. 454. .... 450 By MONTAGU & ROBINSON. Oxford-st.—No. 552, u. t. 274 yrs., g. r. 74, r. 2954. Woodstock-st., City leasehold, g. r. 47, 74, 64, f. 204, 124, r. 1504. .... 4,125 Bayswater—1a, and 1 to 10, Caroline-pl., and 6, g. r. 10, Poplar-pl., u. t. 15 yrs., g. r. 104. .... 4,120 Notting Hill—154 and 156, High-st., f. r. 1554. Bayswater—186, Westbourne Grove, u. t. 44 yrs., g. r. 124, 78, r. 454. .... 515 By A. J. SHEPHERD. Kingsland—106, Boleyn-rd., u. t. 83 yrs., g. r. 84. Leyton—159, 161, 163, and 165, Beaumont-rd., u. t. 79 yrs., g. r. 124. .... 470 Wapping—Lower-st., "York House," u. t. 63 yrs., g. r. 204. .... 170 Poplar—116, Canon-st., f. r. 334, 164. .... 345 3 and 25, Cobden-st., u. t. 45 yrs., g. r. 64. .... 345 Canning Town—50 to 58 (even), Garney-rd., u. t. 87 yrs., 154. .... 425 South Tottenham—9 to 39 (odd), Shaftesbury-rd., u. t. 81 yrs., g. r. 424. .... 905 By MESSRS. COBB. Clapham—7, Laikhal-rd., u. t. 64 yrs., g. r. 34, r. 8. .... 620 Bloomsbury—Drake-st., a rent charge of 54, 95, 40, u. t. 81 yrs. .... 125 Cobham, Kent—Four cottages, forge, and fruit plantation, 9 a. 1 r. 8 p. f. u. t. 924 yrs., g. r. 724. Ignham, Kent—Enclosures of land, 7 a. 1 r. 8 p. f. Eight freehold cottages .... 885 "Fibby" Farmhouse and 9 a. o. r. 17 p. f. .... 2,800 Wrotham, Kent—"Kiln Field," 21 a. 2 r. 2 p. f. .... 800 "The Rose and Crown" b-h. and 18 a. o. r. 1 p. f. "Sheet Hill Farm," 6 a. o. r. 27 p. f. .... 2,450 By STIMSON & SONS. St. Pancras—Chalton-st., f. g. r. 3204, 158, re- versions varying from 254 to 314 yrs. .... 11,765 Clendon-sq., f. g. r. 34, reversions in 224 and 244 yrs. .... 1,100 Stibington-st., f. g. r. 224, reversions in 244 yrs. .... 1,500 Maida Vale—Britol gardens, i. g. r. 244, 108, u. t. 52 yrs., g. r. 44. .... 2,300 Camden Town—Torrion-av., i. g. r. 304, u. t. 45 yrs., g. r. 104. .... 385 Dalston—Graham-rd., i. g. r. 224, 108, u. t. 61 yrs., g. r. 134. .... 155 By SANDERS & SON (at Barnstable). High Bickington, Devon—"Seckington Farm," 56 a. 3 r. 33 p. f. .... 980 By C. F. BLAKLEY (at New Radnor). Kinnerton, Radnor—"The Lower House Farm," 88 a. f. .... 3,820 By MESSRS. PALMER (at Yeovil). Tintinhull, Somerset—"The Mansion Estate," 71 a. o. r. 2 p. f. .... 3,850 3 six freehold cottages. .... 280 Ash, Somerset—Four enclosures of land, 44 a. 1 r. 3 p. f. .... 2,050 June 25.—By TUCKETT & SON (at Leicester). Oadby, Leicester—"The Heintgate" and 11 a. o. r. 11 p. f. .... 3,575 Two enclosures, 24 a. 2 r. 17 p. f. .... 350 Hoby, Leicester—"A freehold farm, area 155 a. 2 r. 15 p. .... 5,050 By EDWELL & SONS (at Cambridge). Sturmer, Essex—"The Sturmer Hall Estate," 404 a. 1 r. 21 p. f. (in lots). .... 4,885 By W. J. PIERCE & THORPE (at Northampton). West Haddon, Northants—"The Lodge Farm," 202 a. 2 r. 24 p. f. .... 6,500 "The Buttit Farm," 92 a. 1 r. 33 p. f. .... 4,500 By FRANKLIN & JONES (at Oxford). Marcham, Berks—"Upwood Park Estate," 81 a. 3 r. 22 p. f. .... 2,000 Chalford, Oxon—"A freehold tithe rent charge of 904. .... 1,300 June 27.—By EASTMAN BROS. Kensington—Castle-rd., i. g. r. 104, u. t. 37 yrs., g. r. 114. .... 190 Grafton-cres., i. g. r. 214, u. t. 37 yrs., g. r. 114. Forest Hill—"Honor Oak-rd., "Oakley House" f. r. 1054. .... 1,605 By MAY & PHILPOT. Brixton—188, Tulse Hill, f. r. 854. .... 1,000 30, Tulse Hill, also i. g. r. 924, 144, u. t. 204 yrs. g. r. 74. .... 600 Wandsworth—45, Huntsmoor-rd., u. t. 914 yrs., g. r. 54, r. 304. .... 315 By RUMBLE & EDWARDS. Ash, Kent—"The Moat Farm," 169 a. 1 r. 5 p. f. .... 5,800 Earl's Colne, Essex—"Chandler's Farm," 54 a. g. r. 74, f. .... 850 "Lower Farm," 63 a. 2 r. 24 p. f. .... 1,600 "Chalkney Wood," 63 a. 1 r. 34 p. f. .... 690 An enclosure of land, 7 a. 1 r. 16 p. f. .... 250 Shepherd's-croft, nine cottages, f. .... 500 Priory-st., a freehold house and six cottages .... 505 By A. SAVILL & SONS. Orsett, Essex—"Limekiln Farm," 34 a. o. r. 26 p. f. .... 600 An enclosure of land, 10 a. 2 r. 27 p. f. .... 340
---	--	--	--

An enclosure of garden land, 28 a. 1 r. 3 p. 31.	£450	Tooting.—Streatham-lane, freehold building estate, 23 a.	£10,200	By MORRIS, SONDS, & PEARCE (at Ginstons).
Whitechapel—3 and 5, Great Garden-st.—area 10,606 ft. u.t. 40 yrs., q. r. 1001, r. 3501.	2,900	Mitcham.—London-rd., fig. r. 251, reversion in 54		Meare, Somerset.—"Great House," and a 2 a. 3 r.
14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 221				



Cropwell Bishop, Notts.—"The Limekiln Inn" and 36 a. r. 1 p. 6, f. r. 551.	£2,650
June 28.—By G. F. HARRINGTON.	
Forest Gate—137 and 139, Shrewsbury-rd., f. r.	585
507, 106, and 108, Shrewsbury-rd., f. r.	7,150
By MURDOCK & CO., 10, Abchurch-lane, E.C. 4.	
Hamstead—6 and 9, Eldon-rd., ut. 533 yds., g. r.	1,900
247, r. 1851.	
By THORNE & SON.	
Brentwood, Essex.—High-st., two freehold houses and shops, r. 1401.	2,650
Chapman's-alley, a freehold cottage.	105
By DEBENHAM, TEWSON, & CO.	
Hamstead Heath—"Golden Hill" and 36 a. or.	38,500
21 p. f.	
Walton-on-Thames, Surrey.—Boves-rd., "Cottimore" and "Walton Lodge" and 33 a.	10,000
13 p. f.	
Marylebone—85, St. Fortland-st., ut. 74 yds., g. r.	3,200
341, r. 3504.	
48, St. Marylebone-st., ut. 74 yds., g. r.	1,800
204.	
Holloway—55 and 57, Carleton-rd., ut. 204 yds., g. r.	2,115
304, r. 1301.	
Kensington.—Camden House-rd., i. g. r. 154, ut.	250
45 yds., g. r.	
By BEAN, BURNETT, & ELDRIDGE.	
Barnsbury—47 and 57, Hemingford-rd., ut. 44 yds., g. r.	755
124, r. 761.	
4, Thornhill-st., ut. 81, g. r.	505
Caledonian-rd.—90, Frederick-st., ut. 53 yds., g. r.	335
61, r. 741.	
74, Blundell-st., ut. 53 yds., g. r.	300
Calcutta-rd.—30, Duke-st., ut. 108, r. 381.	
44 and 54 yds., g. r.	260
Hackney.—West-st., i. g. r. 504, ut. 62 yds., g. r.	575
274.	
Horseley Rise, Chesham, Bucks.—i. g. r. 201, reversion in 83 yrs.	340
By HAMPTON & SONS.	
St. Isells, Pembroke.—F. G. T. 107, reversion in 45 yrs.	530
A freehold holding, comprising 11 a. 0 r. 10 p.	750
By J. HIBBARD & SONS.	
Edmonton.—Brentnall-rd., a block of building land, f.	440
9 to 13, Argyle-rd., f. r. 934, 125.	840
1 to 8, Argyle-rd., ut. 83 yds., g. r. 321.	710
Walthamstow—21, 25, Lennox-rd., f.	440
By REYNOLDS & SONS.	
Stepney—7, 9, and 11, Garden-st., f. r. 781.	590
Mike End—1 and 3, James-st., ut. 14 yds., g. r.	105
Alidgate—1, Duke-st., ut. 9 yds., g. r. 354.	305
45, Great Prescott-st., ut. 9 yds., g. r. 354.	1,010
Spitalfields—80, Brushfield-st., f. r. 604.	1,550
By S. & G. KINGSTON (at Spalding).	
Surfleet, Lincoln.—"Red House Farm," 71 a. 1 r.	4,150
9 p. f.	
Surfleet, &c., Lincoln.—Two enclosures, 9 a. or.	440
33 p. f.	
Gosherton, Lincoln.—Enclosures of land, 10 a. 1 r.	500
15 p. f.	
By FLEUREY, SONS, & ADAMS (at Masons' Hall).	
City of London.—Chapelade and Honey-lane Market, "Mago's," ut. 64 and 704 yds., g. r.	36,300
1,640, with goodwill.	
St. George's East—28, Cable-st., and "The Bricklayers Arms" p. h., freehold rentals of 195, reversion in 21 and 30 yrs.	3,560
Hammersmith.—"The Grove," "The Grove Tavern," ut. 47 yds., g. r. 1047, with goodwill.	28,110
By W. J. GAYLOR (at Masons' Hall).	
Islington.—Upper-st., "The Mitre" p. h., ut. 20 yds., r. 1054, with goodwill.	7,860

PRICES CURRENT OF MATERIALS.			
TIMBER.		TIMBER (continued).	
Greenheart, B.G.	10/0	Sath, Pontic (continued)	9/15
Teak, E.I., loc.	10/0	Walnut, Italian	9/0 3/4
Sequoia, U.S. loc.	10/0	METALS.	
Ash, Canada, load	10/0	Iron—pig	5/10
Birch, do.	10/0	Land	2/15
Elm, do.	10/0	Pur, Wash, in	1/10
Fir, Dantsic, &c.	10/0	Do. in	5/10 1/2
Oak, do.	10/0	Do. at works	5/10
Canada, do.	10/0	Do. in	5/10 1/2
Pine, Canada red	10/0	Do. Staffordshire	5/10 1/2
Do. yellow	10/0	Do. in	5/10 1/2
Lath, Dantsic, fath	10/0	Do. in	5/10 1/2
St. Petersburg, do.	10/0	Do. in	5/10 1/2
Walnut, Riga, &c.	10/0	Do. in	5/10 1/2
Do. log, &c.	10/0	Do. in	5/10 1/2
Do. 4th and 5th	10/0	Do. in	5/10 1/2
Do. 6th and 7th	10/0	Do. in	5/10 1/2
Do. 8th and 9th	10/0	Do. in	5/10 1/2
Do. 10th and 11th	10/0	Do. in	5/10 1/2
Do. 12th and 13th	10/0	Do. in	5/10 1/2
Do. 14th and 15th	10/0	Do. in	5/10 1/2
Do. 16th and 17th	10/0	Do. in	5/10 1/2
Do. 18th and 19th	10/0	Do. in	5/10 1/2
Do. 20th and 21st	10/0	Do. in	5/10 1/2
Do. 22nd and 23rd	10/0	Do. in	5/10 1/2
Do. 24th and 25th	10/0	Do. in	5/10 1/2
Do. 26th and 27th	10/0	Do. in	5/10 1/2
Do. 28th and 29th	10/0	Do. in	5/10 1/2
Do. 30th and 31st	10/0	Do. in	5/10 1/2
Do. 32nd and 33rd	10/0	Do. in	5/10 1/2
Do. 34th and 35th	10/0	Do. in	5/10 1/2
Do. 36th and 37th	10/0	Do. in	5/10 1/2
Do. 38th and 39th	10/0	Do. in	5/10 1/2
Do. 40th and 41st	10/0	Do. in	5/10 1/2
Do. 42nd and 43rd	10/0	Do. in	5/10 1/2
Do. 44th and 45th	10/0	Do. in	5/10 1/2
Do. 46th and 47th	10/0	Do. in	5/10 1/2
Do. 48th and 49th	10/0	Do. in	5/10 1/2
Do. 50th and 51st	10/0	Do. in	5/10 1/2
Do. 52nd and 53rd	10/0	Do. in	5/10 1/2
Do. 54th and 55th	10/0	Do. in	5/10 1/2
Do. 56th and 57th	10/0	Do. in	5/10 1/2
Do. 58th and 59th	10/0	Do. in	5/10 1/2
Do. 60th and 61st	10/0	Do. in	5/10 1/2
Do. 62nd and 63rd	10/0	Do. in	5/10 1/2
Do. 64th and 65th	10/0	Do. in	5/10 1/2
Do. 66th and 67th	10/0	Do. in	5/10 1/2
Do. 68th and 69th	10/0	Do. in	5/10 1/2
Do. 70th and 71st	10/0	Do. in	5/10 1/2
Do. 72nd and 73rd	10/0	Do. in	5/10 1/2
Do. 74th and 75th	10/0	Do. in	5/10 1/2
Do. 76th and 77th	10/0	Do. in	5/10 1/2
Do. 78th and 79th	10/0	Do. in	5/10 1/2
Do. 80th and 81st	10/0	Do. in	5/10 1/2
Do. 82nd and 83rd	10/0	Do. in	5/10 1/2
Do. 84th and 85th	10/0	Do. in	5/10 1/2
Do. 86th and 87th	10/0	Do. in	5/10 1/2
Do. 88th and 89th	10/0	Do. in	5/10 1/2
Do. 90th and 91st	10/0	Do. in	5/10 1/2
Do. 92nd and 93rd	10/0	Do. in	5/10 1/2
Do. 94th and 95th	10/0	Do. in	5/10 1/2
Do. 96th and 97th	10/0	Do. in	5/10 1/2
Do. 98th and 99th	10/0	Do. in	5/10 1/2
Do. 100th and 101st	10/0	Do. in	5/10 1/2
Do. 102nd and 103rd	10/0	Do. in	5/10 1/2
Do. 104th and 105th	10/0	Do. in	5/10 1/2
Do. 106th and 107th	10/0	Do. in	5/10 1/2
Do. 108th and 109th	10/0	Do. in	5/10 1/2
Do. 110th and 111st	10/0	Do. in	5/10 1/2
Do. 112th and 113th	10/0	Do. in	5/10 1/2
Do. 114th and 115th	10/0	Do. in	5/10 1/2
Do. 116th and 117th	10/0	Do. in	5/10 1/2
Do. 118th and 119th	10/0	Do. in	5/10 1/2
Do. 120th and 121st	10/0	Do. in	5/10 1/2
Do. 122nd and 123rd	10/0	Do. in	5/10 1/2
Do. 124th and 125th	10/0	Do. in	5/10 1/2
Do. 126th and 127th	10/0	Do. in	5/10 1/2
Do. 128th and 129th	10/0	Do. in	5/10 1/2
Do. 130th and 131st	10/0	Do. in	5/10 1/2
Do. 132nd and 133rd	10/0	Do. in	5/10 1/2
Do. 134th and 135th	10/0	Do. in	5/10 1/2
Do. 136th and 137th	10/0	Do. in	5/10 1/2
Do. 138th and 139th	10/0	Do. in	5/10 1/2
Do. 140th and 141st	10/0	Do. in	5/10 1/2
Do. 142nd and 143rd	10/0	Do. in	5/10 1/2
Do. 144th and 145th	10/0	Do. in	5/10 1/2
Do. 146th and 147th	10/0	Do. in	5/10 1/2
Do. 148th and 149th	10/0	Do. in	5/10 1/2
Do. 150th and 151st	10/0	Do. in	5/10 1/2
Do. 152nd and 153rd	10/0	Do. in	5/10 1/2
Do. 154th and 155th	10/0	Do. in	5/10 1/2
Do. 156th and 157th	10/0	Do. in	5/10 1/2
Do. 158th and 159th	10/0	Do. in	5/10 1/2
Do. 160th and 161st	10/0	Do. in	5/10 1/2
Do. 162nd and 163rd	10/0	Do. in	5/10 1/2
Do. 164th and 165th	10/0	Do. in	5/10 1/2
Do. 166th and 167th	10/0	Do. in	5/10 1/2
Do. 168th and 169th	10/0	Do. in	5/10 1/2
Do. 170th and 171st	10/0	Do. in	5/10 1/2
Do. 172nd and 173rd	10/0	Do. in	5/10 1/2
Do. 174th and 175th	10/0	Do. in	5/10 1/2
Do. 176th and 177th	10/0	Do. in	5/10 1/2
Do. 178th and 179th	10/0	Do. in	5/10 1/2
Do. 180th and 181st	10/0	Do. in	5/10 1/2
Do. 182nd and 183rd	10/0	Do. in	5/10 1/2
Do. 184th and 185th	10/0	Do. in	5/10 1/2
Do. 186th and 187th	10/0	Do. in	5/10 1/2
Do. 188th and 189th	10/0	Do. in	5/10 1/2
Do. 190th and 191st	10/0	Do. in	5/10 1/2
Do. 192nd and 193rd	10/0	Do. in	5/10 1/2
Do. 194th and 195th	10/0	Do. in	5/10 1/2
Do. 196th and 197th	10/0	Do. in	5/10 1/2
Do. 198th and 199th	10/0	Do. in	5/10 1/2
Do. 200th and 201st	10/0	Do. in	5/10 1/2
Do. 202nd and 203rd	10/0	Do. in	5/10 1/2
Do. 204th and 205th	10/0	Do. in	5/10 1/2
Do. 206th and 207th	10/0	Do. in	5/10 1/2
Do. 208th and 209th	10/0	Do. in	5/10 1/2
Do. 210th and 211st	10/0	Do. in	5/10 1/2
Do. 212th and 213th	10/0	Do. in	5/10 1/2
Do. 214th and 215th	10/0	Do. in	5/10 1/2
Do. 216th and 217th	10/0	Do. in	5/10 1/2
Do. 218th and 219th	10/0	Do. in	5/10 1/2
Do. 220th and 221st	10/0	Do. in	5/10 1/2
Do. 222nd and 223rd	10/0	Do. in	5/10 1/2
Do. 224th and 225th	10/0	Do. in	5/10 1/2
Do. 226th and 227th	10/0	Do. in	5/10 1/2
Do. 228th and 229th	10/0	Do. in	5/10 1/2
Do. 230th and 231st	10/0	Do. in	5/10 1/2
Do. 232nd and 233rd	10/0	Do. in	5/10 1/2
Do. 234th and 235th	10/0	Do. in	5/10 1/2
Do. 236th and 237th	10/0	Do. in	5/10 1/2
Do. 238th and 239th	10/0	Do. in	5/10 1/2
Do. 240th and 241st	10/0	Do. in	5/10 1/2
Do. 242nd and 243rd	10/0	Do. in	5/10 1/2
Do. 244th and 245th	10/0	Do. in	5/10 1/2
Do. 246th and 247th	10/0	Do. in	5/10 1/2
Do. 248th and 249th	10/0	Do. in	5/10 1/2
Do. 250th and 251st	10/0	Do. in	5/10 1/2
Do. 252nd and 253rd	10/0	Do. in	5/10 1/2
Do. 254th and 255th	10/0	Do. in	5/10 1/2
Do. 256th and 257th	10/0	Do. in	5/10 1/2
Do. 258th and 259th	10/0	Do. in	5/10 1/2
Do. 260th and 261st	10/0	Do. in	5/10 1/2
Do. 262nd and 263rd	10/0	Do. in	5/10 1/2
Do. 264th and 265th	10/0	Do. in	5/10 1/2
Do. 266th and 267th	10/0	Do. in	5/10 1/2
Do. 268th and 269th	10/0	Do. in	5/10 1/2
Do. 270th and 271st	10/0	Do. in	5/10 1/2
Do. 272nd and 273rd	10/0	Do. in	5/10 1/2
Do. 274th and 275th	10/0	Do. in	5/10 1/2
Do. 276th and 277th	10/0	Do. in	5/10 1/2
Do. 278th and 279th	10/0	Do. in	5/10 1/2
Do. 280th and 281st	10/0	Do. in	5/10 1/2
Do. 282nd and 283rd	10/0	Do. in	5/10 1/2
Do. 284th and 285th	10/0	Do. in	5/10 1/2
Do. 286th and 287th	10/0	Do. in	5/10 1/2
Do. 288th and 289th	10/0	Do. in	5/10 1/2
Do. 290th and 291st	10/0	Do. in	5/10 1/2
Do. 292nd and 293rd	10/0	Do. in	5/10 1/2
Do. 294th and 295th	10/0	Do. in	5/10 1/2
Do. 296th and 297th	10/0	Do. in	5/10 1/2
Do. 298th and 299th	10/0	Do. in	5/10 1/2
Do. 300th and 301st	10/0	Do. in	5/10 1/2
Do. 302nd and 303rd	10/0	Do. in	5/10 1/2
Do. 304th and 305th	10/0	Do. in	5/10 1/2
Do. 306th and 307th	10/0	Do. in	5/10 1/2
Do. 308th and 309th	10/0	Do. in	5/10 1/2
Do. 310th and 311st	10/0	Do. in	5/10 1/2
Do. 312th and 313th	10/0	Do. in	5/10 1/2
Do. 314th and 315th	10/0	Do. in	5/10 1/2
Do. 316th and 317th	10/0	Do. in	5/10 1/2
Do. 318th and 319th	10/0	Do. in	5/10 1/2
Do. 320th and 321st	10/0	Do. in	5/10 1/2
Do. 322nd and 323rd	10/0	Do. in	5/10 1/2
Do. 324th and 325th	10/0	Do. in	5/10 1/2
Do. 326th and 327th	10/0	Do. in	5/10 1/2
Do. 328th and 329th	10/0	Do. in	5/10 1/2
Do. 330th and 331st	10/0	Do. in	5/10 1/2
Do. 332nd and 333rd	10/0	Do. in	5/10 1/2
Do. 334th and 335th	10/0	Do. in	5/10 1/2
Do. 336th and 337th	10/0	Do. in	5/10 1/2
Do. 338th and 339th	10/0	Do. in	5/10 1/2
Do. 340th and 341st	10/0	Do. in	5/10 1/2
Do. 342nd and 343rd	10/0	Do. in	5/10 1/2
Do. 344th and 345th	10/0	Do. in	5/10 1/2
Do. 346th and 347th	10/0	Do. in	5/10 1/2
Do. 348th and 349th	10/0	Do. in	5/10 1/2
Do. 350th and 351st	10/0	Do. in	5/10 1/2
Do. 352nd and 353rd	10/0	Do. in	5/10 1/2
Do. 354th and 355th	10/0	Do. in	5/10 1/2
Do. 356th and 357th	10/0	Do. in	5/10 1/2
Do. 358th and 359th	10/0	Do. in	5/10 1/2
Do. 360th and 361st	10/0	Do. in	5/10 1/2
Do. 362nd and 363rd	10/0	Do. in	5/10 1/2
Do. 364th and 365th	10/0	Do. in	5/10 1/2
Do. 366th and 367th	10/0	Do. in	5/10 1/2
Do. 368th and 369th	10/0	Do. in	5/10 1/2
Do. 370th and 371st	10/0	Do. in	5/10 1/2
Do. 372nd and 373rd	10/0	Do. in	5/10 1/2
Do. 374th and 375th	10/0	Do. in	5/10 1/2
Do. 376th and 377th	10/0	Do. in	5/10 1/2
Do. 378th and 379th	10/0	Do. in	5/10 1/2
Do. 380th and 381st	10/0	Do. in	5/10 1/2
Do. 382nd and 383rd	10/0	Do. in	5/10 1/2
Do. 384th and 385th	10/0	Do. in	5/10 1/2
Do. 386th and 387th	10/0	Do. in	5/10 1/2
Do. 388th and 389th	10/0	Do. in	5/10 1/2
Do. 390th and 391st	10/0	Do. in	5/10 1/2
Do. 392nd and 393rd	10/0	Do. in	5/10 1/2
Do. 394th and 395th	10/0	Do. in	5/10 1/2
Do. 396th and 397th	10/0	Do. in	5/10 1/2
Do. 398th and 399th	10/0	Do. in	5/10 1/2
Do. 400th and 401st	10/0	Do. in	5/10 1/2
Do. 402nd and 403rd	10/0	Do. in	5/10 1/2
Do. 404th and 405th	10/0	Do. in	5/10 1/2
Do. 406th and 407th	10/0	Do. in	5/10 1/2
Do. 408th and 409th	10/0	Do. in	5/10 1/2
Do. 410th and 411st	10/0	Do. in	5/10 1/2
Do. 412th and 413th	10/0	Do. in	5/10 1/2
Do. 414th and 415th	10/0	Do. in	5/10 1/2
Do. 416th and 417th	10/0	Do. in	5/10 1/2
Do. 418th and 419th	10/0	Do. in	5/10 1/2
Do. 420th and 421st	10/0	Do. in	5/10 1/2
Do. 422nd and 423rd	10/0	Do. in	5/10 1/2
Do. 424th and 425th	10/0	Do. in	5/10 1/2
Do. 426th and 427th	10/0	Do. in	5/10 1/2
Do. 428th and 429th	10/0	Do. in	5/10 1/2
Do. 430th and 431st	10/0	Do. in	5/10 1/2
Do. 432nd and 433rd	10/0	Do. in	5/10 1/2
Do. 434th and 435th	10/0	Do. in	5/10 1/2
Do. 436th and 437th	10/0	Do. in	5/10 1/2
Do. 438th and 439th	10/0	Do. in	5/10 1/2
Do. 440th and 441st	10/0	Do. in	5/10 1/2
Do. 442nd and 443rd	10/0	Do. in	5/10 1/2
Do. 444th and 445th	10/0	Do. in	5/10 1/2
Do. 446th and 447th	10/0	Do. in	5/10 1/2
Do. 448th and 449th	10/0	Do. in	5/10 1/2
Do. 450th and 451st	10/0	Do. in	5/10 1/2
Do. 452nd and 453rd	10/0	Do. in	5/10 1/2
Do. 454th and 455th	10/0	Do. in	5/10 1/2
Do. 456th and 457th	10/0	Do. in	5/10 1

**MARYPORT.**—For additions to business premises, Curzon street, for the Co-operative Society. Mr. C. Eaglesfield, architect, Maryport.  
T. Ferguson, joiner, Maryport. £294 17  
[For the whole]

**NEW BROMPTON (Kent).**—For the erection of drapery and art furnishing stores, for Mr. C. Fynn. Mr. E. J. Hammond, architect, 111, High-street, New Brompton. Quantities by the architect.  
H. Wyles ..... £595 T. Cornhill ..... £595  
J. Wellford ..... 955 H. E. Phillips, New Brompton (accepted) ..... 895  
J. H. Harris ..... 875

**NORWICH.**—For the restoration of nave and a new south aisle to Cistercian Church. Mr. Arthur J. Lacey, architect and Ecclesan Surveyor, 5, Upper King-street, Norwich. Quantities supplied.  
R. Chapman ..... £1,049 F. Guston ..... £910  
J. Downing & Son ..... 979 J. H. Smith ..... 845  
S. R. Wilkins ..... 937 G. E. Haves, Norwich ..... 845  
\* Accepted.

**PETERBOROUGH.**—For the erection of two houses, Parliament-street. Mr. J. G. Stallebras, architect, North-street, Peterborough.  
Hicks Bros. .... £472 5 8 Sibley Bros. .... £435 0 0  
Watson & Lucas ..... 410 0 Nichols (accepted) ..... 354 10 0  
[All of Peterborough]

**PLYMOUTH.**—For making certain structural alterations and additions to the Old Yacht Club premises, Millway-road, as new offices for the Western Counties Agricultural Association, Limited. Mr. Robt. H. B. Neal, architect, Central Exchange, Plymouth.  
F. C. Barry ..... £2,000 J. Partridge ..... £1,785 0  
F. C. Ambrose ..... 1,904 18 T. Jenkins & Son ..... 1,750 0  
J. Gold & Co. .... 1,723 A. Andrews ..... 1,740 0  
Walsham Bros. .... 1,580 0 A. N. Coles ..... 1,754 0  
J. W. Cooke, Exeter ..... 1,220 J. H. Black, Plymouth ..... 1,737 0  
A. R. Leitch, Plymouth ..... 1,775 0  
Son ..... 1,775 0  
\* Accepted.

**PORTSMOUTH.**—For the erection of a church to St. Stephen, Portsea, for St. Stephen's Church Building Committee. Mr. R. A. Crowley, architect, 29, High-street, Croydon. Quantities by Messrs. E. M. Whitaker and Mr. C. C. Mayland.  
W. Larnou ..... £2,113 0 J. Crockerell ..... £1,527 0  
W. Potter ..... 8 5 0 Light & Son ..... 7,425 0  
Clark & Son ..... 8,567 Thos. F. Hall, and ..... 1,740 0  
Stephens, Bantow, & Bedford-road, South-ampstead ..... 6,568 13  
Co. Ltd. .... 7,668 0 J. W. Portman ..... \* Accepted.  
J. M. Perkins ..... 7,577 0

**PUTNEY (Surrey).**—For new road, and sewers on the estate of Mr. R. J. Pettward. Messrs. Lee & Pain, architects and surveyors, 55, Lincoln's Inn, London. Quantities by Mr. J. Meares.  
W. R. Williams ..... £1,851 J. Meares ..... £1,851  
F. Smith ..... 4,883  
\* Accepted.

**REIGATE.**—Accepted for the erection of a house at Underhill Park, Reigate, for Mr. G. Taylor. Mr. C. E. Salmon, architect, Bell street, Reigate.  
W. Bagley & Son ..... £4,433

**RUNCORN.**—For new furniture for the Board-room of the Runcorn Union Workhouse, Dutton. Mr. Samuel Davies, architect, Sun-on and Frodsham.  
Turner, Son & Walker ..... £237 0 Robert Gamett & Son Waring & Gilroy, Ltd. .... 252 0 Warrington (accepted) ..... £157 0

**ST. LEONARDS-ON-SEA.**—For house and shop, Norman-road, St. Leonards-on-Sea, for Mr. W. Beatty. Messrs. Elworthy & Son, architects, London-road, St. Leonards. Quantities by the architect.  
H. E. Cruttenberg ..... £1,435 F. G. Hutton ..... £1,212  
P. Jenkins ..... 1,400 Barber & Gasson ..... 1,007  
Blodgett & Cruttenberg ..... 1,375 W. G. Morgan, St. Leonards ..... 1,215  
Sagham & Hutchings ..... 1,350 \* Accepted.  
C. Hanna ..... 1,275

**STOCKPORT.**—For infirmary extensions. Messrs. Woodhouse & Willoughby, architects, Manchester.  
Byron ..... £12,383 T. & W. Meadows ..... £12,383  
G. Macfarlane ..... 11,591 Heaton Norris ..... \* Accepted.  
J. Briggs ..... 11,595

## O. B. N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, YEW, AND TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY TRICKENESS, DRY, AND FIT FOR IMMEDIATE USE. Telephone, No. 374 Holborn. Telex Address: "SNEWIN, London."

**STONEHOUSE.**—For new premises, for Mr. John Perry (including the removal and setting back of "Tommy's Corner"). Mr. H. J. Snell, architect.  
J. J. Berry ..... £3,157 W. Falk ..... £2,163  
S. Harvey ..... £1,937 J. Parn ..... 2,135  
T. May ..... 2,835 G. B. Turpin ..... 2,653  
T. Cress ..... 2,785 J. Jenkins & Son, Devon  
H. Blackell ..... 2,775 post ..... 2,559  
\* Accepted.

**WALTHAMSTOW.**—For executing sundry repairs at the undermentioned schools for the Walthamstow School Board. Mr. W. A. Longmore, architect, Bridge Chambers, Walthamstow.  
Maynard-road Schools—C. Studds ..... £139 10 0  
Markhouse-road Schools—Lee & Allen ..... 95 15 0  
Marsh-street Girls and Infants Schools—W. Laurence ..... 31 7 6  
Marsh-street Boys' Schools—W. Laurence ..... 29 5 0  
Higham Hill Schools—W. Laurence ..... 129 0 0  
Pretoria-avenue Schools—W. Laurence ..... 17 0 0  
Camel-road Schools—W. Laurence ..... 170 0 0  
Shere Hall Schools—G. M. Page ..... 04 0 0  
Forest-road Schools—Archer ..... 7 10 0  
\* Accepted.

**WEDNESBURY.**—For the erection of a fire station, &c., High Bullen, for the Corporation. Mr. M. Scott, Borough Engineer, Town Hall, Wednesbury.  
W. H. Mallin ..... £565 G. Summerhill ..... £865  
John Dallow ..... 950 J. Holloway, Wednesbury ..... 899  
G. Williamson ..... 912 W. Glazier ..... 935  
W. T. Lees ..... 926  
\* Accepted.

**WEDNESBURY.**—For reinstating certain roads in the borough damaged by mining operations, for the Corporation. Mr. E. M. Scott, Borough Engineer and Surveyor.  
F. J. Smith ..... £248 0 J. W. Freeday, Wednesbury (accepted) ..... £188 15

**WEDNESBURY.**—Accepted for street improvements, Wallis-road and Mill-street, King's Hill, for the Corporation. Mr. E. F. J. Smith ..... £158 0 0 J. W. Freeday, Wednesbury (accepted) ..... £157 9 3

### TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## J. J. ETRIDGE, JR.

SLATE MERCHANT,  
SLATER and TILER.

ESTIMATES GIVEN FOR  
SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,  
Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to

BETHNAL GREEN SLATE WORKS,

BETHNAL GREEN, LONDON, E.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 45, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (by prepaying at the Publishing Office, 19s. per annum or 4s. 9d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

### THE BATH STONE FIRMS, Ltd.

BATH.  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

### HAM HILL STONE DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trunk & Son The Doulting Stone Co.)  
Chief Office:—Norton, Stoke-under-Ham, Somerset.  
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

SPRAGUE & CO., Ltd.,  
PHOTOLITHOGRAPHERS,  
4 and 5, East Harding-street,  
Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

METCHIM & SON, 8, PRINCES STREET, ST. GEORGE'S ST. WESTMINSTER  
"QUANTITY SURVEYORS' DIARY AND TABLES," For 1898, price 6d. post 7d. In leather 1/1 Post 1/4 ADVT.

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C.  
SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS, DAMP COURSES, AREAS, ROOFS, WASHHOUSE AND DAIRY FLOORS, &c., &c.

This Asphalte was chosen to be laid at Sandringham, on the new General Post Office, and other important buildings.

### TWELVE GOLD AND SILVER MEDALS AWARDED.

# IRON CISTERNS.

## F. BRABY & CO.

VERY PROMPT SUPPLY.

LARGE STOCK READY.

CYLINDERS FOR HOT-WATER CIRCULATION.

Particulars on application.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL: 6 and 8, HATTON GARDEN.

GLASGOW: 47 and 49, ST. ENOCH-SQUARE.

BRISTOL: ASHTON GATE WORKS, CORONATION RD.



## ILLUSTRATIONS.

Sculpture from the Paris Salon of this Year:—

"Philosophie de l'Histoire," Mr. Boucher, Sculptor; The Clairon Monument, M. Gauquié, Sculptor; "Douce Langueurs," M. Vital Cornu, Sculptor	Double-Page Ink-Photo.
The Cliff Hotel, Gorleston-on-Sea.—Messrs. G. J. & F. W. Skipper, Architects	Double-Page Photo-Litho.
A Seaside Hotel in Cornwall.—Messrs. Rogers, Bone, & Coles, Architects	Double-Page Ink-Photo.
Design for a Small Wooden Church.—By Mr. W. Stanley Bates, A.R.I.B.A.	Single-Page Photo-Litho.
New Public Hall and Offices, Hitchin.—Mr. Geoffrey Lucas, Architect	Single-Page Photo-Litho.

## Blocks in Text.

Extracts from the Year-Book of the School of Architecture of the University of Pennsylvania.	Page 57	The Oak House, West Bromwich	Page 56
Old Blue Coat School, Caxton-street	" 54	Tintern Abbey	" 59
A Seaside Hotel in Cornwall	Page 61	Cliff Hotel, Gorleston-on-Sea. General Plan	" 60
			Page 61

## CONTENTS.

The Rules under the Workmen's Compensation Act	49	Training of a Craftsman"; Rev. W. D. Sweeting and C. H. B. Quennell's "Bell's Cathedral Series"; F. R. Farrow's "Specifications for Building Works, and How to Write Them"; J. Ruskin's "The Stones of Venice"; J. Ruskin's "The Art of England and the Pleasures of England"; H. H. Statham's "Architecture among the Poets"; F. R. Farrow's "Fire-Resisting Floors in London"	57	A Seaside Hotel in Cornwall	61
Egyptian Antiquities at University College, London	50	Trade Catalogues	59	Design for a Timber Church	61
Notes	50	Books Received	59	Hitchin Town Hall	61
Architecture at the Royal Academy.—V. de V.	53	Tintern Abbey	59	The Students' Column: Sound, Light, and Heat.—III.	62
Blue Coat School, Westminster	54	Tudor-street Ancient Light Case	59	General Building News	62
Royal Institute of British Architects	55	Two-spired Churches	59	Sanitary and Engineering News	62
Competitions	55	Architects' Benevolent Society	60	Foreign	64
Architectural Societies	55	Sculpture from the Paris Salon	60	Miscellaneous	64
Archaeological Societies	55	Cliff Hotel, Gorleston-on-Sea	60	Capital and Labour	65
Engineering Societies	55			Legal	65
The London County Council	56			Meetings	66
The Oak House, West Bromwich	56			Recent Patents	66
The Association of Municipal and County Engineers	56			Some Recent Sales of Property	66
Books: John Belcher and Mervyn E. Macartney's "Later Renaissance Architecture in England"; Fred Miller's "The				Prices Current of Materials	69
				Tenders	69

## The Rules Under the Workmen's Compensation Act.



It is in many ways to be regretted that the Rules under the Workmen's Compensation Act were published at so very late a date, for the Act itself came into operation on the first of this month. Though nominally Rules, they are an integral part of the new legislation. They amplify the Act itself, carrying out in detail its general principles. They have already, however, forced their way into what may be popularly called the literature of the subject, and may be perused in a useful little book by Messrs. Minton-Senhouse and Emery.\*

Dealing, however, with the Rules, we find twenty-three "Regulations" as to Medical Referees. These officials are all to be appointed by the Home Secretary. The Act, it will be remembered, states that any dispute under its provisions shall be settled by arbitration, and if such proceedings become necessary then, "if the committee, arbitrator, or judge shall be satisfied, after hearing all medical evidence tendered by either side, that such evidence is either conflicting or insufficient (Regulation 2), they shall obtain a report from a medical referee." Here we must say that, in the interests of economy and of business, it would have been better to have done without medical evidence at all, and for the deciding tribunal to have referred the medical question in the first place to a medical referee. It is very doubtful if, when opposing medical evidence has been given, the most satisfactory course is not for the question to be decided by an impartial layman. How-

ever, we prefer at the moment to discuss the actual rules rather than their policy. If the new system works well there is no more to be said. The rest of the regulations point out what the practice is to be when the medical referee is "called in," and though no doubt they will ultimately require to be amended in places, they seem to be reasonable and satisfactory as a whole.

We now come to what are called "the Statutory Rules," which are sixty-seven in number, forming, it will be obvious at a glance, an important code of procedure. They should be studied by all who are interested in this subject, but some short observations on them may be desirable. One thing is clear, that workmen who desire to go to arbitration will need legal assistance. For example, Rule 8 states that "an application for the settlement of any matter by arbitration shall be made by the applicant filing with the Registrar a request for arbitration intitled in the matter of the Act and in the matter of the arbitration, which request shall be entered and numbered as a plaint, &c." It seems clear that as particulars must be appended to the request, containing among other things "a concise statement of the circumstances under which the application is made," an ordinary workman cannot conduct the litigation himself. This is only one instance; but throughout the proceedings skilled assistance cannot be dispensed with. While we are touching on this point it is desirable to point out that by Rule 32 a party may not only appear in person, or by counsel or solicitor, but, with the leave of the judge or arbitrator, by a member of his family or by a person in the permanent and exclusive employment of such person, or, in the case of a company or society, by an officer or member of such company or society. Finally, "under special circumstances," he may appear by any other person.

An important feature of this code is that which allows a person from whom compensation is claimed, if he considers that for some

reason or other he is entitled to an indemnity from a third party, to serve the latter with a notice, and to bring him into the proceedings. This procedure is, of course, very important for the purpose of finally ending all disputes.

The thirty-third rule deals with the question of costs. There is one rule which we are glad to see, and which will be a protection to reasonable employers. It runs: "The judge or arbitrator, in dealing with the question of costs, may take into consideration any offer of compensation proved to have been made on behalf of the employer." Another important batch of the rules shows how the provisions of the fifth section of the Act are to be carried into operation; that is, when a workman is entitled to compensation from an employer who is bankrupt, and who is insured against loss from the claims of workmen. Yet another—namely, Rule 59, is concerned with the "payment and application of money directed to be invested." Finally there is one long rule, 65, which is greatly subdivided, and which deals with the record of proceedings, and of these a special register is to be kept. These rules are followed by thirty forms, the last of which is of this special register.

As we have already said, defects in the procedure and omissions from it are pretty sure to be found from time to time, and we have no doubt that some time or other an amended set of rules will have to be framed. Meanwhile we can only hope that they will be required but little, for it is obvious that proceedings under the Act must be expensive—as expensive as an ordinary legal action—even though they are disguised under the name of arbitration. From what has been stated above, some kind of idea of the scope and intention of these Rules will be obtained by our readers. It is almost needless to point out that as they are concerned so much with technical details they should be carefully perused by all who are likely to be affected by them, since observations on and even quotations from them cannot give their full purport.

\* "A Handbook to the Workmen's Compensation Act, 1897." By R. M. Minton-Senhouse and G. F. Emery, Barristers-at-Law. London: Bemrose & Sons, Limited.

# EGYPTIAN ANTIQUITIES AT UNIVERSITY COLLEGE, LONDON.

**A**N important exhibition of Egyptian antiquities is being held at University College in Gower-street, and will be open until the end of the month. The tangible results of two excavations are here shown, minus the huge toll of more than half the finds, which has been retained by the museum authorities in Cairo.

The excavations of the Egypt Exploration Fund at Denderah, under the direction of Professor Flinders Petrie, who has also organised the whole of this exhibition, were confined to the necropolis. The remains of the city itself are extensive, and the Ptolemaic and Roman temple, which was completely cleared by Mariette, is one of the sights of the country. The cemeteries, however, on the edge of the desert, had not been excavated or even plundered in modern times, and the prospects for working them to advantage seemed very favourable. Unhappily it proved that in ancient times they had been very extensively plundered; also an ancient invasion of white ants had made away with everything edible to ants in graves of the earlier periods. One such tomb which must have contained fine wooden figures, and carved panelling was filled with the galleries of these devastating pests. Another curious fact shown by the excavations is that the necropolis of Denderah, so far at any rate as it is at present known, contains no monuments dating from between the twelfth and twenty-sixth dynasties; yet the twelfth, eighteenth, and nineteenth dynasties were perhaps the greatest periods of Egyptian art and power. This hiatus is somewhat incomprehensible, for Denderah was always the capital of its name; and, more important still, it was the chief centre of the worship of Hathor, a goddess high in favour throughout Egyptian history. We should naturally have expected, therefore, to find in this necropolis magnificent tombs of the local high priests and monarchs during those great dynasties.

But Professor Petrie's excavations have yielded important results for the history of tomb architecture, in an obscure but very interesting period of which we have little monumental record, viz., the era between the Sixth Dynasty and the eleventh. Mastaba tombs, with walls of brick built in a series of panelled recesses, and with inscribed and sculptured slabs of stone let in as "false doors," &c., were found representing almost the whole of this epoch, which links the brilliant Twelfth Dynasty to the Old Kingdom. The style of sculpture and writing was in many cases very barbaric even when the workmanship was careful, or even, as was sometimes the case, undeniably fine. Samples of all these sculptures and inscriptions are included in the exhibition, but a vast number of their fragments remain to be sorted and pieced together. In a mastaba of the Sixth Dynasty was found a perfect example of an arch in brick; this is the clearest instance known from the Old Kingdom. An isolated "false door" dating from the Third or Fourth Dynasty is fine, both in design and in detail. Of Roman period there is a large amount of somewhat coarse, but bold, glass inlay, perhaps from a shrine, and of cylinders of coloured glass to be strung on metal rods, probably to form stems for temple candelabra, &c.

Small antiquities of general interest are also very fairly represented from Denderah. There are bronze vessels, amulets, mummy labels, mummified hawks, &c., flint implements, palaeolithic and other. And there is a wonderful mussel shell of the Old Kingdom, of diorite, worked true and thin to translucency. A very large number of blocks were excavated, Professor Petrie having had the assistance not only of Mrs. Petrie but also of Mr. Mare, Mr. Norman Davies, and Mr. MacIver.

The work of the "Egyptian Research Account" was singularly successful, and has carried off the season's palm. Hieraconpolis, opposite El Kab, was chosen as the site. Mr. Somers Clarke and Mr. J. J. Tylor provided Mr. Quibell with a large proportion of his working funds; but Mr. Somers Clarke himself was working at El Kab. Mr. Quibell was substantially helped in his digging by Miss Pirie and Mr. Green.

It was only in 1896 that Egyptologists first penetrated to the back of the third dynasty. Since then each year has brought to light abundant and important evidence concerning the earlier and as yet prehistoric periods. This is partly owing to the prosecution of the more scientific method of excavation introduced into Upper Egypt by Professor Petrie, and the careful investigation of uninscribed remains; partly also to fortunate finds of inscribed monuments. In 2000 "prehistoric" tombs opened by Professor Petrie and Mr. Quibell, near Negadeh, not a single scrap of inscription was found, though abundant information was nevertheless extracted from them. But at or about the same period writing was known, and inscribed objects have been found by De Morgan and Amelineau in the tombs of kings and great men of the court. Now, however, at Hieraconpolis—a site which at first appeared unpromising—the foundation platform of a small temple has yielded a door jamb, statues, slate plaques, ivories of every shape, huge ceremonial mace-heads, all elaborately sculptured, and many of them inscribed with the names of one or other of two kings, whom at present it is difficult to locate except vaguely in the time before Seneferu. Perhaps they may have reigned at Hieraconpolis before Menes, the titular founder of the First Dynasty and of the Egyptian monarchy. Probably these ancient offerings were piously buried by later builders of the temple. Splendid examples of artistic workmanship, dating from at least 4,000 B.C., are exhibited, and their style is essentially Egyptian. This is especially marked in the case of the royal statuettes, which scarcely differ from similar statues of later date, except in the position of the arms. But the differences of detail, as seen in some of the carvings on ivory, &c., are great, and the human figures generally are not Egyptian in type. Green glazing was freely used at this time, and this confirms the high antiquity of the green tiles from the pyramid of Saggareh, which have been supposed to belong to a XXVth Dynasty restoration.

A curious early device may be seen in a quartzite door-socket, representing a foreigner crushed by the door which pivoted in the middle of his back and swung over his head. This idea, though once referred to in a very late text, is to us a new motif in Egyptian architecture. What possibilities it suggests for an architect of an Imperial Institute!

Russia, France, and Germany might thus be pinned down under the portals at South Kensington, and the device would be a fitting complement to those egregious British lions without.

## NOTES.

The New Government Offices.

We are informed that the Government have decided on the architects for the two principal blocks of proposed new Government offices. Mr. Brydon is to carry out the block on the Great George-street and Parliament-street site, and Mr. William Young is to have the War Office.

Railway Passenger Communication.

It is satisfactory to find that the Board of Trade has at last taken some decided action in regard to the means for railway passengers communicating with the guard or driver of a train in case of need, and that it has emphatically condemned the farce of the outside cord "on the right hand side in the direction in which the train is travelling." Independent of the fact that a passenger if taken ill, or if attacked by any one, could hardly get at such a cord, we have a strong suspicion that in many cases, had the cord been tried, it would have been found to be not acting. The Board of Trade hold that the principal electrical systems or the power of a partial application of the brake may be taken as efficient, and "they have no doubt that those railway companies by whom the cord is still used will at once take steps to substitute for it a proper means of communication." We imagine that something more than this politely expressed "hope" will be required before a proper system of communication is universally established.

The Lamp-standards, Waterloo Bridge.

A PIECE of County Council vandalism is in course of perpetration at Waterloo Bridge which ought to be energetically protested against. The cast-iron lamp standards on the bridge are of unusual and very dignified design; they were obviously intended to suit the monumental style of the bridge, and may be regarded as part of the design. Three or four of these are now being removed, or rather have been removed, to make way for modern thin cylindrical lamp-posts of perfectly inferior character. We are informed that these are for electric light, and that the remainder of the old lamp-posts will remain. We presume it has not occurred to any one concerned that they are thus spoiling Waterloo Bridge. Surely the old standards could have been adapted to carry an electric light lantern; and even if they could not, the new posts might at least have been designed in the same style and proportions as the old. It is, as far as we can see, a very stupid piece of work, and a wanton injury to the effect of our grand bridge.

Drain or Sewer?

It must be confessed that the difficult circumstances under which Acts of Parliament have to be interpreted are often singular. In the case of *Geen v. the Vestry of St. Mary, Newington*, reported in the current number of the "Law Reports," there is a decision on the Metropolis Local Management Act, 1855, which illustrates the above remark. As most of our readers are aware, if a pipe is a drain it is repairable by the owner of the premises; if

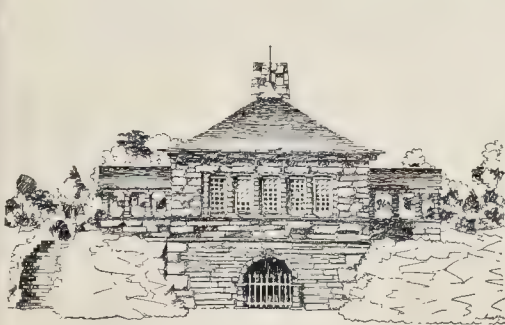




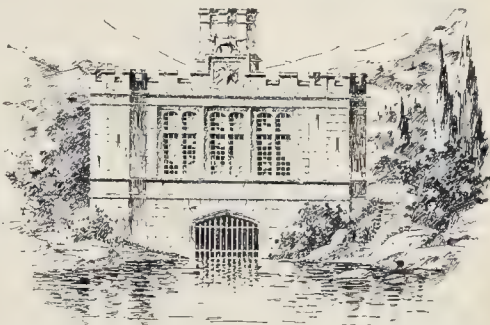
1. Design for Campanile; by Virgil L. Johnson.

2. Old Presbyterian Church, Philadelphia (sketch by F. F. Lincoln).

3. Design for Campanile; by B. M. Nisbet.



4. Design for Hunting Lodge; by P. R. Siegel.



5. Design for Hunting Lodge; by L. H. Koch.

*Extracts from the Year-Book of the School of Architecture of the University of Pennsylvania.*

An American  
Architectural  
School.

THE "Yearbook" of the Pennsylvania University School of Architecture is a pamphlet containing a number of reproductions from designs made by the students, with brief summaries of the "programme" under which they were drawn up. Like everything of this kind which comes from America at present, the designs have for the most part the appearance of having come from the École des Beaux-Arts at Paris, completely and almost ostentatiously following the type of design and the method of drawing which obtains at the French school. This, as we have often said, is a great pity; it would be far better if American centres of education were to endeavour to develop their own school of drawing and design, instead of parroting from the French. Granting the position, however, many of the designs

are of high merit in their kind. Among the best may be mentioned Mr. Hiram Miller's sketch for a crematorium, and Mr. H. B. Custes' façade for a club-house, which has the defect however, to be seen in more than one well-known London club-house (the Athenæum, for instance) that the design divides the façade into two nearly equal heights. The club is supposed to be one "for an Association of Artists"; hence, no doubt, the treatment of the upper story without windows; one may suppose that it consists of a top-lighted picture-gallery or range of studios. We give reproductions of a few of the designs which are drawn in line, and which, partly perhaps because of the method of execution, are somewhat less "Beaux-Artish" than the others. The washed drawing subjects in the French style would not bear a second reproduction.

is a sewer, by the Public Authority. In the present case a drain was made in 1874 for the purpose of taking away the sewage from four houses by a combined operation. Subsequently, without the knowledge of the Vestry, a stable drain was connected with it. Then, as time went on, a nuisance occurred, and the question arose who was to do the necessary work, the owner or the Vestry. This depended on whether the pipe in question was a drain or a sewer. "The statute says in substance that . . . a drain is that which is used for the drainage of one building only, or of a group or block of houses, by a combined operation, under the order of the Local Authority." This, however, was more than such a drain, for its character had been altered by receiving the drainage of the stable, and so it had become a sewer, and was repairable by the Vestry.

The National  
Free Labour  
Association.

THIS Association has published a small pamphlet giving "its foundation, history and work." This is rather a grandiloquent description of so small a publication, but it is desirable that the growth of this Association should be made known to working men. Soon after it was established in 1893 it had 9,000 members. In January of last year it had 160,000. That such a body was sooner or later certain to come into existence was obvious, and it is equally certain that it will be of permanent benefit to the working men of England, if it checks the tyranny which too often characterises the course of trades-unionism. On the other hand, such an institution is sometimes in danger of playing into the hands of unscrupulous capitalists. For it must never be forgotten that trades unions properly conducted are desirable safeguards of labour, and it is only when they become aggressive that they have to be fought against.

The Plymouth  
Council and the  
Architects.

THE Corporation of Plymouth offered a premium of 150*l.* to competing Plymouth architects for the best designs for a new frontage of shops in Tavistock-street, the selected design to become their property. Eighteen Plymouth architects have signed a letter refusing to compete under these conditions. They demand a first premium of 250*l.*, coupled with the following stipulation:—

"That the architect, who is the author of the first premiated design, shall provide working and detail drawings, together with full size detail drawings of all moulded and enriched work to the purchaser (or his professional adviser) of any one or more of the sites, and that he shall have power to enforce the carrying out of the design on the lines approved by the Committee, and for such services he shall be paid a fee of seven guineas on each site by the purchaser thereof."

They have also demanded the appointment of an assessor, which has been conceded, as also the 250*l.* premium, but the Committee object to the other demands. The point of the architects' demand is of course, that the selected architect may make a good design and find it entirely spoiled in the carrying out, without his having any control over it. The architects object also, and with reason, to furnish a plan for the shops to be erected, on the double ground that one plan is not likely to suit all requirements, and that if it did, they would be furnishing, for a small sum, a plan which would be used by a variety of persons without their getting anything for it. Evidently what the Committee want is a good architectural character for the fronts. Perhaps the best way of meeting the difficulty would be to engage the selected architect to superintend the carrying out and detailing of all the fronts, keeping the plans and internal arrangements in their own hands.

Drawbacks  
of Electric  
Traction.

THE recent official report by Mr. Trotter, lately editor of the London *Electrician* and now electrician to the Cape of Good Hope Government, is instructive, seeing that rapid progress is at last being made in electric traction in this country. He says that after the Cape Town Suburban Tramway had been working some weeks it was found that the water-pipes were being seriously corroded, that telegraphic service was entirely stopped on some lines, and that several accidents, including an outbreak of fire, had

been caused by telephone wires falling across the trolley wire. More stringent regulations were thereupon imposed on the tramway company. Again, owing to numerous accidents by electric shocks from the Cape Town tramways, Mr. Trotter has drawn up a code of regulations for the police. He begins by saying that if a trolley wire falls on the street, the best thing to do is to leave it alone and prevent any one touching it. It is better to impede the traffic rather than for the constable to leave his post to get rubber gloves. Mr. Swinburne's evidence to a Government Committee about the beauty of the curves shown by a trolley wire finds no echo from Mr. Trotter. "The thick wires which run above the middle of the street are called trolley wires. Smaller wires called 'span wires' are stretched across the street to support the trolley wire. Other small wires are erected in some streets to prevent telephone wires from falling on the trolley wires." Mr. Trotter warns constables not to push the trolley wire on to the rails so as to earth it, as the flash will be so brilliant that not only will it unnecessarily alarm bystanders, but will also so dazzle the constable who does it that he will be unable to see anything for a minute or so.

Electric Light-  
ing in the  
City.

THE proposal that the City Corporation should purchase the works of the City of London Electric Lighting Company for 3,000,000*l.*, and supply ratepayers with electricity at the reduced rate of 6d. per unit, has been much discussed lately. It has been asserted that they would derive a substantial profit by doing this, but a letter written by the Charing Cross and Strand Electricity Supply Company to the Clerk of the Streets Committee of the City Corporation gives an altogether new aspect to the question. The company points out that in the event of their obtaining the provisional order from the Board of Trade, for which they are applying, they will supply consumers in the City by a low-tension direct current distributing network, at the rate of 5d. per unit for lighting, reducible to 4d. by means of a sliding scale, and at about half this rate for power. If the City Corporation were to reduce the proposed price per unit so as to compete with this company, then they would be paying 444,000*l.*, the value of the undertaking in view of the approaching competition, and 2,556,000*l.* for the "municipalisation of electricity," which, in view of a recent decision of a House of Lords Committee giving a private company power to compete with corporations (including Sheffield, Nottingham, Doncaster, &c.), may have only a sentimental value. The conclusion, therefore, seems to be that the desired reduction in tariff could be easily obtained without any expense to the Corporation, by their simply supporting the application to the Board of Trade of the Charing Cross Company. This company has competed vigorously and successfully for the last nine years with two powerful alternating current companies which supply its district, and has entered into no agreement with either of them to restrict competition.

Ardchattan,  
Argyllshire.

THIS estate will shortly be offered for sale at auction in Edinburgh. It extends over 14,000 acres, lying around Lock Etive, and

has a rental—the priory and shootings excepted—of 1,550*l.* The ruins of Ardchattan Priory are on the property, and the present mansion house, known as "The Priory," contains the hall and other parts of the priory's house. The priory, of monks of Valliscaulium, was founded in 1230 by Duncan MacCoul, ancestor of the MacDougals of Lorne, and stands on the north side of the loch. Robert Bruce retired to this district after his defeat at Methven, and it was the home, according to Ossian, of Usnath, father of Nathos, who carried thither Dardula, the wife of Conquhan, King of Ulster.

Newcourt's  
Survey of  
London.

UNTIL the other day it was commonly understood that the only existing copy of this survey is the one preserved in the Bibliothèque Nationale at Paris. By the courtesy of Messrs. Stanford, of Cockspur-street, we have seen the copy recently deposited with them by Mr. Lindsay. The survey, made on a scale of 1 in. to 150 yards, "by Richard Newcourt of Somerton, in the county of Somerset, gentleman," and engraved by William Faithorne (*obit* 1601), was reproduced on five sheets, 75 in. by 39 in., by George Jarman, and published on May 1, 1857, by A. E. Evans & Son, of No. 403, Strand. It bears the royal arms, the arms of twelve of the City Companies, perspective views of St. Paul's and Westminster Abbey, descriptive letter-press, and a genealogical tree to show the descent from Uranus of Brutus "A.M. 2853, founder of London." The map bears date: "1658," yet it appears that the survey had been made a few years earlier, for it delineates Charing Cross, which was pulled down in June-August, 1647, as Lilly records in his "Observations on the life of King Charles," 1715; and, on the other hand, does not depict the Queen Eleanor Cross which stood in Cheap-side, opposite Wood-street, until its demolition on May 2, 1643, "to cleanse that great street of superstition" (Archbishop's Laud's Troubles, &c.): a date confirmed by an entry for that day in Evelyn's diary. The map, whose genuineness we see no reason to question, is in good state, and gives an interesting presentment of the extent of London two hundred and fifty years ago. On the west, the town ends with the village of St. Giles-in-the-Fields, St. James's Park, and "Berkshire," since "Cleveland" and now the site of "Bridge-water," House; on the north all is open country beyond Clerkenwell and Bunhill Fields; eastwards there are only a few houses outside a line drawn from the Tower to White-chapel Church, with the streets to Shore-ditch, Wapping, and Limehouse; whilst the south is bounded by Westminster, Lambeth, and a group of houses around St. George's Church, Southwark. The total inhabited area thus amounts to no more than four and a half square miles. The river, below bridge, is filled with shipping, and at the north, south, and east limits we indicate windmills are placed.

Stipple and  
Mezzotint  
Engravings.

At the Society of Fine Arts in Bond-street there is a collection on view of stipple and mezzotint engravings of the eighteenth century, a class of works much in fashion with collectors now, and which have a considerable interest not only for excellence in their own mode of execution, but also



as records and examples of the artistic taste of the time when they were done. Most of these are what are called coloured engravings, which means in many cases that a little colour is expended on the costume and a bright red bloom is given to the cheeks, as if the lady had rouged plentifully; Condé's "Mrs. Tickell, after Cosway" (3), is a typical example. Nothing could well be more conventional or less really artistic in the true sense of the word; but this kind of thing represented the taste of the day and the favourite method for fashionable portraits on a small scale. Others show an attempt to give the whole colour scheme of a picture, as in "The Sleeping Nymph" after Opie, by Simon (4A); with a very mechanically arranged scale of colour. The portrait of the Countess of Harrington (10), again, shows us Reynolds translated into terms of Bartolozzi, so to speak. One may be thankful that in the present day we have better aesthetic ideas as to the artistic reproduction of paintings. Among the exhibits are two coloured drawings by Stothard, "Venus Rising from the Sea" and "Antiope Rescued from a Wild Boar" (51), with Stothard's usual weak conventionality in the figures of the women, but the seahorses in the "Venus" are finely treated. There is a pencil drawing by Cosway of "Leda" (47) among the original works. The great majority are engravings, however, and form a very good summary of the art of the period in this class of work, the interest in which, and the commercial value of which has been so much revived recently. Fifty years ago coloured mezzotints like "The Horse Feeder—after Morland," and others of similar type, used to be hung in the nursery; now they are prized possessions of the art-collector. There is more of fashion than artistic perception in all this.

Burne-Jones's Works at Christie's.

CHRISTIE'S Rooms are a kind of enchanted land during the last days of this week, three rooms being full of the paintings and studies left by Sir E. Burne-Jones, and which are to be sold next week. Among the paintings are "Love and the Pilgrim," the study for the mosaic for the American Church at Rome, the picture of the mustering of the rebel angels, a splendid piece of colour and composition, although the individual figures are weak; a large design for a stained glass window, "Paradise," childlike in conception but admirable in a decorative point of view; "The Sirens," with a ship which would have required no Sirens to bring it to destruction; and various works in colour, of less importance and repute. Another room contains smaller colour studies, and the entrance room a large number of the pencil studies for heads and figures, which are perhaps the most beautiful and attractive part of the collection.

PLYMOUTH ARCHITECTS AND THE CORPORATION. —A letter from Mr. B. Priestley Shires, on behalf of the architects of Plymouth, was read at the last meeting of the Special Works Committee of the Plymouth Corporation. It intimated that they were unanimously agreed that their objections to the terms of the competition in connexion with the Tavistock-road improvement scheme were reasonable, and were of considerable importance to them professionally; they therefore requested the committee to reconsider and adopt, at least the general principle underlying the suggestions they had put forward. Under the circumstances, the committee recommended the Council to make it an open competition, on the conditions originally laid down for the competition restricted to Plymouth architects.

#### ARCHITECTURE AT THE ROYAL ACADEMY.—V.

DECORATIVE work is not very largely represented in the architectural room this year. The first thing we notice in the order of hanging, is the first in the catalogue of the room; Mr. J. J. Shaw's "Design for Gates" (1595), which is hung too high to be well seen, but which appears to be the design for bronze gates illustrated in our issue of October 23 of last year: it is a bold and effective design in Renaissance style, but with some originality in the treatment of the detail. Professor Aitchison's "Decoration for a Chapel" (1604), was illustrated recently in our pages, but necessarily only in monochrome form. It depends for its colour effect a good deal on the use of natural marbles, which are combined in an effective manner. The main portion of the wall below the cornice level is veneered with a rather light-coloured and very strong and pediment of a doorway in strong red marble stands out in strong relief, with a black marble panel under the pediment. The columns are in a veined marble considerably darker than the ground, and in which red predominates. The entablature is treated in gilding, with a deep-blue frieze, the colour of which is repeated in the dado of the lantern at the top of the dome. The pendentives of the dome are decorated with large conventionalised gold flowers on a blue ground, and the dome itself with a very Renaissance decoration of panelling formed by strips of foliage, and birds and other incidents dotted about. The frieze in the archivolt of the arch is decorated with naturalistic fruit and foliage designed in the Della Robbia manner, only (as far as we gather) in the flat instead of in relief. Every separate portion of the design is pleasing, but we must confess that above the entablature level the design seems to us made up of rather heterogeneous elements, which have hardly sufficient relation to each other in manner and style; the lower portion is broad and harmonious in effect.

In Mr. Formill's "Design for the Decoration of a Room at Walsingham House" (1613) the fresco picture painted on the wall is the most interesting portion; the decoration of the portion of the wall shown consists of a Corinthian column and entablature in a very light cream tint with a grey marble (?) pedestal; the lower half of the wall is occupied by oak panelling and top moulding, decorated in gilding. This is a capable piece of work, but as already observed, the picture, a scene with classic figures, is the real attraction. The ceiling is also shown, with a centre panel with some floating figures and also, unfortunately, a treatment of architectural adjuncts in upward vanishing perspective, on the system the French are so fond of, and which we entirely disapprove. Mr. Charles Robinson's "Mural Decoration" (1639), a panel which looks as if it were meant for mosaic, is an effective thing shown in a powerfully executed drawing; it is a symbolical head with a nimbus, drawn full face and rising from amid broadly designed conventional foliage; the whole is surrounded by a rather curious framing looking as if it were formed out of light grey "crackle" ware; there is rather a German look about the whole thing, but it is certainly effective. Mr. Skipworth's design for a chancel screen for All Saints' Church, Fulham (1651) is a good piece of open wooden screen-work which may be praised not only for its detail but for the effective and graceful outline or "skyline" which it makes. The tracery, intermingled with floral forms, is not a mere imitation of mediæval tracery, and the manner in which the little angel figures are introduced in loops in the tracery is pretty and effective. A little drawing by the same architect (1776) shows us a design for a Rood screen and pulpit for Udimore Church, Sussex, in which the pulpit is made to form part of the design of the Rood screen; there is a kind of octagonal turret at each end of the screen, against the chancel wall, and in the centre of the north turret the pulpit opening is formed; the other turret, which is treated with open-work tracery at the same point, we presume contains a stair to the Rood loft. The treatment of the pulpit in this way is exceedingly good in an architectural sense; the question perhaps is whether it will place the preacher in the most favourable position for being heard.

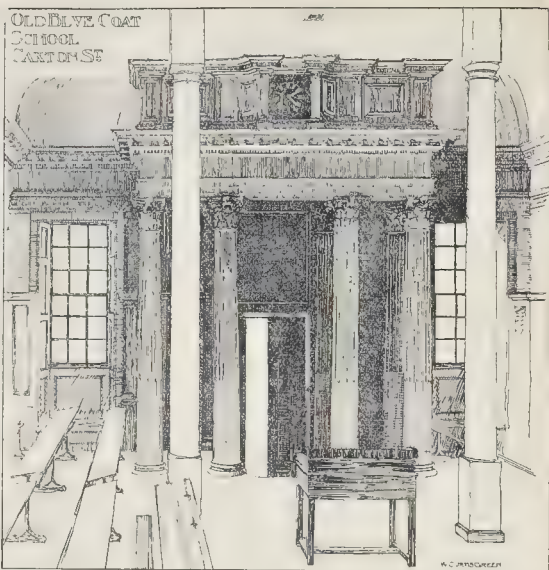
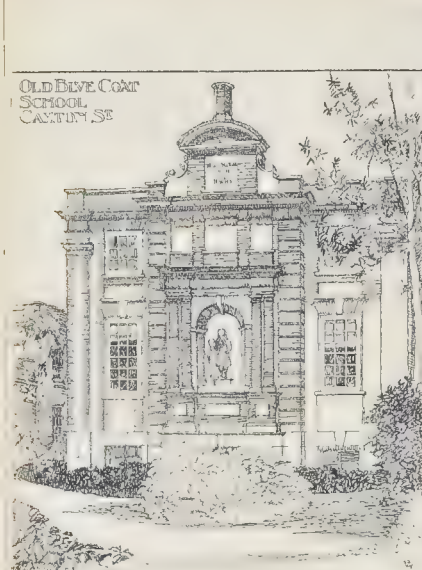
Mr. Oakes's "Design for a Memorial Cross and Fountain for Town's Green, Chorley" (1657)

is a very ecclesiastical type of fountain, with an octagon basin with tracery panels on the sides, and supported at alternate faces by kneeling angels; a cross, which seems rather too large in scale as compared with the figures and the other details, rises out of the centre of the basin; the whole is, we fear, rather pretentious than satisfying as a design. Messrs. Rogers, Bone, and Coles exhibit a small sketch (1661) showing new sedilia, choir stalls, and granite pavement for St. Brelade's Church, Jersey; the sedilia are separate pieces of wooden furniture, rather like glorified kitchen chairs placed at the side of the chancel, but the treatment of these and the stalls is original and in good taste, and the simply-treated pavement decidedly characteristic. Their oak lectern for the same church is admirable, there is a real style about this simple piece of church furniture, and it appears to stand firmly on the base formed by a large spreading moulding at the floor line. These are small and unpretentious drawings, but they are very meritorious. We presume Mr. Percy Newton's drawing of "The Great Corridor, Queen's College, Harley-street" (1670) is mainly intended to show the method of treating it in coloured decoration; architecturally it is simply plain square piers and a cross-vaulting without groins; the general effect of the large water-colour sketch is good, but it hardly indicates anything very precisely, only one gathers that the lower part of the vault is decorated with some painted conventional foliage which has a good effect in the drawing.

Messrs. Shrigley & Hunt's "Decoration of Chancel, St. George's Church, Preston" (1691) is a highly finished little drawing showing an effective decorative scheme, with green and red wall shafts, groin ribs treated in chevrons or bands of alternating colour; six-winged seraphs on a gold ground on the vault, and the walls below covered with diapers in subdued tones which throw up by contrast the colour in the windows. Without presenting anything very new or original, this seems a satisfactory piece of work. Mr. Corlette exhibits a drawing of "Painted Decoration, St. Matthew's Church, Yiewsley" (1699), of which it is not very easy to see what it is or for what position; it looks like a piece of ceiling decoration, with the beams fringed by rigidly conventionalised foliage, the spaces (nearly white) occupied by alternately one and two painted medallions in the middle of the ground; the end bay is nearly filled with an expanse of bright red with emblems, the sun, moon, &c., painted on it. Mr. Westlake exhibits a very pleasing pencil drawing, "Study of Two Angels" (1710), and Mr. Bodley a design for a pulpit for St. Michael's, Croydon (1714), which suggests the comment, "See Brandon's Analysis of Gothic Architecture," or some such text book of mediæval details.

Mr. Walter Stacey's "Decoration Design: The Epiphany" (1736) is rather more pictorial than decorative in the treatment of the figures and background; Mr. Westlake gets the true decorative plane in his "Study: portion of a painting at Cambridge" (1742), which is hung too high, however, to be seen except in regard to its general treatment and effect. Mr. G. Watkins' "Design for a frieze" (1770) is very similar to other designs which he has made for the same class of work, and equally good; the author has made his own style in the decorative treatment of foliage. "A Decoration Panel" by Mr. Turner (1775) does not explain itself, either as to material or purpose. Mr. Blomfield's "Processional cross for St. Paul's Cathedral" (1777) is a work of considerable interest, and rather novel in treatment. The cross shows a crucifix on one side and on the other a flat decorative treatment with a small cartouche at the crossing with the symbolical figure of the lamb in it. The angles of the cross are filled up with scrolls in ivory with ivory vine leaves twined about them, and bunches of grapes executed in a red material. On the scale of the detail drawing they look more like currants, both in size and colour, but we presume grapes are what are intended. The general effect of the work is rich and rather novel, but of what material are the thin stalks of the vine-leaves formed, which twine out freely and unsupported, according to the indication in the drawing? Unless of metal, they must be very fragile. Mr. Lyon's "Credence Table for St. Catherine's, Nottingham" (1794) is also an original bit of work, apparently painted wood, coloured pale blue for the general ground. The space between the legs is partially filled up by tracery of a flamboyant character, lined out in





subdued orange colour. Mr. Spiers's "Memorial Fountain" for Locke Park, Barnsley (1799) is hung too high to see in detail; it appears to be a graceful design in its general lines. Mr. Brophy exhibits a water-colour drawing of a design for a "Library Chimney Nook" (1707), a carved stone chimney piece with figures of Adam and Eve at the opposite angles and a decorative "Tree of Knowledge" filling the space over the grate opening; above are three circular medallions each containing two bas-relief heads the symbolism of which is not quite evident; and above, rising from a bracket, the head of Lilith, Adam's demon wife before he married Eve—but what does she do "in this gallery"? In decorative effect the work is excellent, but why place in a library a design representing knowledge as a kind of poison?

Of designs for stained glass there are not many, and indeed paper designs for glass are of little value as giving any idea of the effect of the glass; if the Academy were properly arranged and planned as an "Academy of Arts" there ought to be a gallery for the exhibition of stained glass itself, in a proper light; a matter always attended to at the New Salon at Paris, though unfortunately the glass to be seen there is seldom worth seeing. In England the art of design in stained glass is far better understood than in France, but the National Academy of Arts makes no provision for such work, which the artists have to exhibit as they best may on dull paper with flat pigments, instead of the flashing colour of glass seen by transmitted light. Among the drawings the only one which appears to exhibit real originality of design and treatment is Mr. Whall's design for the circular west window of St. Bartholomew's Brighton (1755), which is in monochrome and is probably to be regarded only as a small cartoon to arrange the design; this appears to be a kind of symbolical suggestion of the sun and the planets, but it is too high to make out much of the detail; one can only see enough to recognise that this is not a design on commonplace lines. Among the coloured drawings for windows Mr. Stanley Watkins exhibits one for a large church window of three coupled lights, with rows of angel figures across the whole composition, alternately standing and kneeling; this is a somewhat mechanical arrangement, and the kneeling figures facing to the front have rather a squat look, as if there was an alternation of tall angels and short ones, but there is a generally good style about the design and a suggestion of refined and restrained colour. The standing angels, in their attitude and attributes, appear to be suggested by Burn-

Jones's "Days of Creation." Mr. Fisher's "Aisle Window" for St. Margaret's Church, Oxford (1660) is a pretty piece of freely designed work in Renaissance style, the side-lights being for the most part plain and filled with small parallelogram panes, only a circular medallion with an angel occupies the centre of the light. The middle window is filled up by a figure and accompanying details. Mr. Dix's window for Houghton Church (1688) is a pretty bit of design; Mr. Stacey's Memorial Window for Christ Church, Hampstead (1735) shows a good style in the treatment of the details; Mr. Leonard Walker's small sketch Design for Stained Glass (1744) seems original, showing several compartments each with a draped female figure in it, sketched in a free style and with indication of good colour effect, but rather too slight a drawing to judge from. Mr. Orr's little drawing of "Designs for Domestic Glass—Girls Playing on Musical Instruments" (1746), though also very small, is carefully and precisely drawn, and exhibits a design of some originality, especially in the treatment of the decorative background. There are also to be noted Mr. Dix's window for St. Peter's, Bideford (1747), very straight-lined in design, but good in colour; Mr. Aikman's design for a window composed of scenes from the life of Christ (1772), a heavily coloured design on a small scale, of which it is impossible to make out much; and Mr. Griffiths's design for a window with the subject "Charity" (1779); a good figure group, but hardly showing character specially suitable to glass design.

We had intended to combine with this brief notice of the decorative designs some remarks on the drawings illustrative of ancient work, but on looking for them we find there is not one in the room. It is impossible to suppose that none have been sent in this particular year, when such drawings have in every previous year formed a more or less important portion of the exhibits in the architectural room; and therefore the only possible conclusion is that whoever had charge of the architectural room this year adopted the principle that it was for the illustration of representations of modern architecture only. That position of course may be reasonably maintained, although in Paris the illustrations of ancient work are generally the finest of the architectural exhibits, and they have sometimes been so in our own small room. Nevertheless, no one would quarrel with the Academy for adopting the principle of reserving the architectural room for drawings or models of modern work only—what people have a right to complain of is that this line should unexpectedly be taken, without the slightest notice, after archi-

tectural draughtsmen have for years been accustomed to find that good drawings of old work are acceptable there. If it were determined that this year architectural exhibits were to be confined to modern work, surely it would have been at least considerate and courteous to have given some intimation through the Press that such drawings would not be accepted this year, or in future, whichever it is to be. But to show such a consideration for the convenience and the feelings of exhibitors would be something entirely foreign to the traditional attitude of the Academy towards intending exhibitors. Let them waste their time on the drawings and find out they are not accepted—they will know better next time! And perhaps next time the architectural drawings will be in the hands of another member with another fad, and another class of drawings will be turned away without notice. The labour expended on paintings and drawings for exhibition at the Academy is, at best, labour expended on a chance—the chance of being accepted or not. But the authors might at least be saved from expending their labour on work which it has been previously determined to exclude.

#### BLUE COAT SCHOOL, WESTMINSTER.

UNDER a scheme recently framed by the Charity Commissioners the site and buildings of this school were to be sold in behalf of the charity to the Vestry of St. Margaret and St. John united parishes for not less than 9,500l., the vestry undertaking to leave the premises standing for the present. It is stated that the buildings will probably be converted for purposes of a local museum. The building, of which we give two sketches, interior and exterior, occupies a triangular plot of ground in what was formerly Palmer's Village, consisting of some cottages scattered around the almshouses, with a chapel and school, founded 1654, in Tothill-side, by the Rev. James Palmer. It stands at the junction of Caxton, formerly Little Chapel, street, and James-street, formerly Buckingham-row; on the east side of the property are a thoroughfare once known as "Blue Coat Ring," and the site of Nicholas Butler's almshouses (1675) latterly, together with Palmer's re-settled in Rochester-row.

An inscription in the pediment of the south front of the boys' school records that the charity was founded in 1688; on the north front, below the statue of a scholar, is an inscription, "The Blewcoat School Built in the Year 1702." The design has been attributed to Wren, but there seems to be no authority for the statement,



On the west side of the boys' schoolhouse stand the girls' school and the master's house; the former was erected in 1868; the south front of the latter bears an inscription, "This Dwelling House for a School Master was built by Voluntary Contributions of several Persons in this Parish 1790." The boys' schoolhouse was erected at the charges of one William Greene, owner of the neighbouring brewery. "Green's brewhouse," is plotted in R. Wilkinson's plan of London, Westminster, and Southwark, 1790, as next, south, to the chapel—Dr. Dodd's chapel—in Charlotte-street, Stafford-row, and was, it appears, the predecessor of Elliot and Watney's, since Watney & Co.'s, under the long familiar sign of the "White Hart."

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following have passed the June Examinations of the Royal Institute of British Architects:—

**Preliminary.**—L. P. Abercrombie, C. J. H. Ascroft, S. B. Ashworth, H. W. Asman, A. H. Atkinson, F. Barclay, H. M. Barker, M. S. Bigwood, H. T. Bill, R. H. Boyd, A. C. Broadbent, W. Broadbent, C. A. Broadhead, J. T. W. Brooke, A. E. Brooker, E. D. Brown, J. Brown, E. A. Brymer, A. A. Carder, W. A. T. Carter, R. M. Chalmers, A. L. Chapman, S. W. Clark, H. H. Clegg, A. R. Conder, V. C. Cook, E. C. R. Dibdin, H. H. Dodd, L. W. Ensor, J. W. H. Farrow, A. E. C. Fenouillet, J. R. Fothergill, R. R. Gall, H. W. Gammidge, A. E. Gelder, C. R. B. Godman, V. R. Gould, W. L. Guest, E. Harding, J. A. Harrison, O. B. Hatchard, T. Hedges, A. Herklotz, W. H. Hobday, A. H. Johnson, L. A. Jones, S. A. Kelly, H. Kenchington, W. Leaning, A. H. Lewis, J. Love, G. H. Lovegrove, B. J. McAdam, A. McDonald, J. C. Mackenzie, H. N. Maund, W. Michelmore, J. Miller, P. Minor, A. C. Nottley, E. Ogden, C. T. Palmer, E. O. Payne, W. S. Payne, T. S. Peace, A. M. Peart, R. T. W. Purchas, A. R. F. Raven, G. Raymond, A. J. Redfern, W. B. Rees, W. F. Richardson, A. R. Robertson, J. R. Robertson, G. M. Roe, S. Salisbury, E. M. Simpson, G. S. Simpson, M. Skinner, E. R. Sladen, P. J. Smith, M. S. Stillman, F. G. Stockdale, F. A. Stowell, H. M. Tait, E. R. Taylor, A. Tedman, R. W. Thomas, F. E. Tomson, H. Wakeford, C. F. Ward, W. Ward, A. E. Webb, R. D. Wells, P. J. Westwood, J. Wilson, D. Wood, C. L. Wright.

**Intermediate.**—R. P. S. Twizell, T. J. Bee, S. Harrison, R. T. Barker, J. G. Ross, C. H. F. Comyn, J. E. Fawcett, A. E. Lacey, L. F. Ward, J. Quail, J. H. Gibbons, N. Thomas, C. H. Heathcote, S. G. Highmoor, H. Moger, H. Gelder, A. Woodroffe, J. F. J. Goodacre, P. J. Turner, R. D. Wells, G. A. Brown, J. M. Ross, A. S. Dorrell, J. I. P. Jones, H. S. Barrett, C. J. Strachan, R. B. Brook-Greaves, H. I. Triggs, E. G. Heathcote, P. T. Hopwood, F. R. Foster, W. Higenbotham, N. Thorp, J. T. Alexander, H. C. Bishop, F. W. A. Buckell, F. B. Chester, W. W. Ellison, P. E. Gloyn, K. J. S. Harris, J. H. Higson, J. Holt, G. F. M. Merriman, J. L. Nicholson, H. W. H. Palmer, A. R. P. Piercy, F. E. Price, E. E. Shepherd, E. A. Toombs, W. J. Wallford, H. P. Williamson, W. Wrigley, C. F. Young.

**Final.**—J. C. Baines, P. C. Blow, V. E. Böhser, R. W. Carden, E. M. Charles, A. Cowie, S. C. Denmead, A. R. Gough, J. S. Harrison, A. Herbert, G. McMichael, L. Moore, C. Kiddey, C. W. Surrey, A. W. Vercoe.

#### COMPETITIONS.

THE NEW WORKHOUSE, WOLVERHAMPTON.—At a meeting of the Wolverhampton Board of Guardians on the 6th inst., it was resolved that Professor Aitchison, R.A., President of the Royal Institute of British Architects, be appointed to nominate an architect of experience as an assessor in the selection of plans for the new workhouse and that the gentleman so nominated be paid a fee not exceeding one hundred guineas.

#### ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION OF IRELAND.—The annual excursion of this Association took place recently at Glendalough. Amongst those present were the President, Mr. J. Howard Pentland, R.H.A.; Messrs. Walter G. Doolin, Thos. F. Slevin, R. Caulfield Orpen, G. Sheri-

dan, Anthony Scott, and R. M. Butler, hon. sec. In the evening the members dined together at the Royal Hotel, Glendalough, the President presiding.

#### ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—A general meeting of this Institute was held on the 6th inst., Judge Baylis, Q.C., V.P., in the chair. Mr. F. G. Hilton Price, exhibited and described a fine example of a thirty-hour alarm clock by Thomas Tompion, made about the year 1670. The silver case is beautiful and rich in design, and is considered by Mr. Charles Shapland as English, despite the six French marks that are on it and the lilies. One of the marks is a spider, being an ancient mark of Alençon. But the weight and feel of the case and the leafy circles and roses, which are also on the brass work under the dial, suggest its English origin. The movements are original in all parts except the springs, and are remarkably well preserved. Professor Bunnell Lewis read a paper on "Roman Antiquities in South Germany," in which he noticed the following remains: 1. A mosaic at Retzlweg (Würtemberg), where the principal figure is Orpheus; he is represented, as usual, seated, playing the lyre and wearing the Phrygian cap; but the expression of his countenance is remarkable; he looks upwards to heaven as if inspired by the Deity. 2. An inscription at Constance, which was formerly at Winterthur in Switzerland. It belongs to the period of Diocletian, and, though only a fragment, is useful for deciphering inscriptions still more imperfect. The date is A.D. 294. 3. Badenweiler, a short distance north of Bâle. The Roman baths at this place are the best preserved in Germany. They consist of two equal parts, each containing two large and some smaller apartments, and separated by a thick middle wall. It was formerly supposed that the division was made between the military and the civilians; but as no objects have been found belonging to the former class, it is now generally agreed that this was a division between men and women's baths. No halls are to be seen here as at Pompeii; on the other hand, enough remains of the foundations and walls to enable us to trace the ground distinctly. 4. The Roman boundary wall in Germany has been the subject of important publications by English and foreign writers; it is now being explored with great care under the auspices of the Reichs-Limes Commission by various local savants; the results of their investigations appear in a series of monographs upon the forts (castella). Many important discoveries have been made. One of the most interesting is a Mithras relief at Osterburken, which ranks first of its class for size for Mithraic legends, mysterious deities, and the union of Persian, Greek, and Chaldean elements.

THE "QUATUOR CORONATI."—The annual excursion of the Society known as the "Quatuor Coronati" was this year to the city of York. On the first day the Dean conducted the party over the Cathedral, and the remainder of the visits were under the direction of Mr. T. Bowman Whythead, the Chapter Clerk. The abbey ruins, the museum, city gates, and Merchant Venturers' Hall having been inspected, the Lord Mayor exhibited the city plate. The second day was devoted to Byland Abbey, Helmsley Castle, and Rievaulx Abbey. The drive over the Yorkshire wolds was much appreciated. Nearly fifty members took part in the excursion.

EAST RIDING ANTIQUARIAN SOCIETY.—The second summer excursion of this Society was held on the 7th inst. Mr. F. S. Brodrick conducted the party, and, beginning at North Grimston, he pointed out that the church was originally a Norman one, but appears to have been rebuilt in the thirteenth century, and the chancel to have been lengthened at three separate times. The most noticeable feature within the church is the font, which is Norman in character. On the east side is a representation of the Descent from the Cross. In the next panel is a figure of St. Nicholas, and the remainder is taken up with the Last Supper. In the chancel are two Early English monumental slabs. Over the west wall is a well-preserved figure of St. Nicholas, with the head of his crozier pointing from him. The party then walked on to Wharmlle-Street, which has a church with a most interesting tower, and although clearly of Norman character and probably built at the

end of the eleventh century, it shows how the Saxon style lingered for a considerable time after the Norman invasion. The west door is an uncommon feature in wold churches, although found at Kirby Grindalyth and Kirby Underdale. The door in question is very narrow. Leaving Wharmlle-Street, the members proceeded by a field-path to Wharmlle Percy, which presents the peculiar feature of a church without a village, tradition saying that the entire population died of the plague in the year after the plague of London, and rumour even indicates the site of the graves of the inhabitants. The church originally was a much larger one, with aisles on both sides, which, however, have disappeared, and been walled up. The church was evidently built in Norman times, and early in that period, and then consisted of nave, chancel, and tower, but whether this tower is now in its original position is not an easy point to decide. Some think it has been rebuilt in its present unique position. It is possible to perceive fragments of Norman stones in the walling-up of the arches, and fragments of early English gravestones in the buttress of the south-west angle of the nave. The members, on leaving Wharmlle Percy, made their way down to Burdale Station.—*Eastern Morning News.*

#### ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—A party of the members of this Society paid a visit on the 13th inst. to the L. B. & S. C. Railway Locomotive Works at Brighton, the Brighton Marine Palace and Pier Works, Volk's Electric Railway, and the Brighton and Rottingdean Seashore Electric Tramroad. On arriving at the L. B. and S. C. Railway Works the visitors inspected the iron foundry, saw mills, carriage-fitting and wheel shops, smith's shop, turnery, and brass foundry, erecting shop, boiler shop, carriage-building shop, wagon building and repairing shop, and the trimming and paint shops. About 2,000 men are employed in these works, mainly for repairing and renewing rolling stock, which now consists of 461 engines, 2,970 carriages, and 8,693 waggons. New stock is built here at the rate of about 20 engines, 100 carriages, and upwards of 400 waggons per annum. There has recently been an installation of hydraulic machinery in the boiler shop, which shop has also been enlarged, and the roof raised for receiving the 12-ton overhead travelling cranes, driven by rope. The erecting shop has also been enlarged, and the overhead cranes, instead of being driven by shafting, have been altered and driven by rope: this work being carried out by Messrs. Craven Bros., Manchester. At the Brighton Marine Palace and Pier Works, the new pier is being constructed by Mr. John Howard, Westminster, from the designs and under the superintendence of Mr. R. St. George Moore, M.Inst.C.E., of Westminster. When completed it will be 1,750 ft. long and 45 ft. wide at the narrowest point. There will be sufficient water at the landing stage to enable Channel steamers to come alongside at all states of the tide. The steam machinery for screwing the piles is worthy of note, being capable of screwing a 12 in. pile with a 2 ft. 6 in. screw blade 10 ft. into the ground in an hour and a half. Mr. W. Collins, the foreman in charge of the work, has succeeded with this machinery in erecting 60 ft. of the pier in seven days. Volk's electric railway, next visited, is well known as the pioneer electric railway in the United Kingdom. The line is three-quarters of a mile long, and is worked on the third rail system. The Brighton and Rottingdean Seashore Electric Tramroad, one of the latest and most peculiar applications of electric traction, is situated on the foreshore entirely between high and low water, and extends from the Paston Place Groyne, within the Borough of Brighton, to Rottingdean—a distance of two miles seven furlongs. At high water of spring tides, at the deepest portion of the line, the rail level is 15 ft. below water level. The permanent way consists of four lines of 52-lb. steel flange rails, laid in pairs to a gauge of 2 ft. 8½ in. and to a total gauge between the outer rails of 18 ft. The sleepers of ordinary railway practice are substituted by concrete blocks and large cast-iron chairs, according to the nature of the ground. The car is carried on sixteen 33-in. wheels in four bogies, two of which occupy each line of road, and are held in position by a strong steel framing. On each bogie stands a main steel tube column, from which spring the arched girders supporting the



deck, which is 25 ft. above rail level, and is 46 ft. long by 22 ft. wide. There is a deck-house, 25 ft. long and 12 ft. wide; when fully loaded it weighs about fifty tons. Mr. Magnus Volk, M.Inst.E.E., of Brighton, and Mr. R. St. George Moore, M.Inst.C.E., of Westminster, were jointly responsible for these works.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Financial Committee, it was agreed to lend the Hammersmith Vestry 15,500l. for electric lighting; the Hampstead Vestry 16,700l. for a similar purpose; the Islington Vestry 2,200l. for street improvements; the Poplar District Board 9,200l. for paving works; the Stoke Newington Vestry 3,000l. for wood paving; the St. Pancras Vestry 21,500l. for a site for baths and the erection of conveniences; the Holborn Guardians 1,000l. for works at the workhouse; the Islington Guardians 18,351l. 10s. 11d. towards the cost of erecting a new infirmary; and the St. Marylebone Guardians 59,340l. for the erection of a workhouse.

**Millbank Estate—Competitive Designs.**—The report of the Housing of the Working Classes Committee contained the following paragraph:—

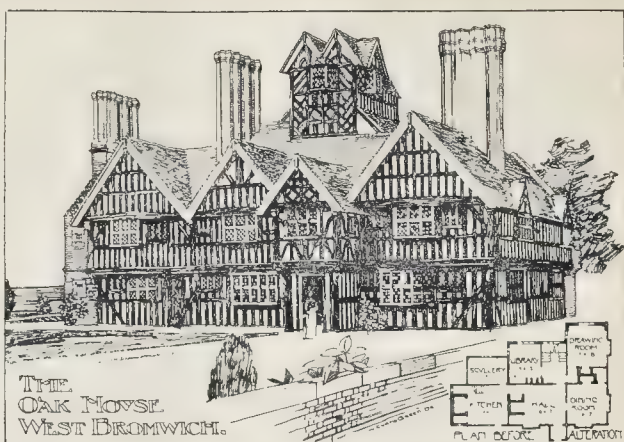
"The Council on February 2, 1897, authorised us to issue an advertisement inviting architects to send in their names as being willing to submit designs for the erection of dwellings on a portion of the Millbank estate; to select a limited number from among such architects, and to invite competitive designs from those so selected. This authority was given to us subject to particulars for the guidance of the selected architects in their work being submitted to the Council. The particulars were approved by the Council on November 16 last, and an advertisement was then issued accordingly. In reply some seventy architects have intimated their willingness to submit competitive designs, and from these we have made a careful selection. We now report for the information of the Council that the following eighteen firms are included in our selection:—Mr. F. Arnett, Mr. T. J. Bushell, Mr. H. H. Collins, Mr. H. F. T. Cooper, Mr. C. E. Cronk, Mr. H. W. Dobb, Messrs. Ellison & Son, Messrs. Gibson & Russell, Mr. G. S. Hill, Mr. F. Hooper, Messrs. Howgate, Leeds & Keith, Messrs. Joseph, Son & Smithem, Messrs. Newman & Jacques, Mr. Rowland Plumble, Mr. W. H. Seth-Smith, Messrs. Spalding & Cross, Messrs. Waring & Nicholson, Mr. R. Williams."

**Places of Worship and Paving of New Streets.**—The Local Government and Taxation Committee brought up a report as to the liability of Nonconformist places of worship to contribute to the cost of paving new streets, the Established Church being exempt from such contributions, and recommended: "That a copy of this report be sent to the Local Government Board, and that the Board be requested to consider the expediency of securing such an amendment of Section 105 of the Metropolis Management Act, 1855, and Section 77 of the Metropolis Management Amendment Act, 1862, as would provide that all churches or chapels exclusively appropriated to public worship shall be exempt from charges for the paving of new streets, and that the deficit caused by such exemptions shall be chargeable against the general rate of the parish or district concerned." By thirty votes to twenty-nine it was, on the motion of Mr. Balian, resolved to add these words: "or, in the alternative, so to amend the law as to make particular places of worship now exempt from the said charges subject to them."

**Ground Values.**—On the motion of Mr. Dickinson it was resolved, after some debate, "That, in view of the large expenditure contemplated in the report of the Improvements Committee dated May 25 and June 15, 1898, it be referred to the Parliamentary and the Local Government and Taxation Committees to prepare and submit to the Council a Bill to be introduced in the forthcoming Session of Parliament whereby owners of ground values in London can be called upon to contribute directly towards the local taxation of the county."

The Council adjourned shortly before eight o'clock.

**APPOINTMENT.**—Mr. C. Hodgson Fowler, F.S.A., has been appointed architect to the cathedral of Rochester, in succession to the late Mr. J. L. Pearson, R.A.



#### THE OAK HOUSE, WEST BROMWICH.

This old house has recently been presented to the town by Mr. Alderman Farley. Instead of oak trees growing all round it, there are now a forest of chimneys, and it forms a little oasis of mediævalism rescued from falling to ruins or into the hands of a speculative builder. The lantern is interesting and an unusual feature, and the inside is rich with carving and painting. The house is being restored and fitted up as a museum, the garden being laid out as a pleasure ground. It is to be opened to the public in the course of this month. We may give some further illustrations of the interior details, &c.

#### THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS:

ANNUAL MEETING: EDINBURGH.

We continue our report of the annual meeting of the Association of Municipal and County Engineers, which, for want of space, we had to divide last week.

#### Housing of the Working Classes.

Mr. W. Bruce, Edinburgh, read a paper on the "Working of the Housing of the Working Classes Act of 1890 in Edinburgh." Having referred to the hardships and discomfort inflicted upon the poor by some of the improvement schemes carried out, without making any suitable provision for the unhouse, he described the method which had been taken with the view of remedying the evils created by the subdivision of tenements. The schemes embraced ten areas of about 6½ acres, which had been acquired by the Corporation at a cost of about 70,000l. Two sites were selected for the erection of workmen's dwellings, one in Cowgate, in the centre of the city, and the other at Tynecastle Meadows, a working class suburb. In Cowgate they had provided twenty-four houses of one apartment and thirty-two houses of two apartments at a cost of 10,000l.; and at Cowgate they had provided twenty-four houses of one apartment, sixteen houses of kitchen and bed closet, and twenty-four houses of two apartments at a cost of about 8,700l. The rentals were from 2s. 6d. to 2s. 7d. for houses of one apartment, and from 3s. 6d. to 4s. for houses of two apartments. It was estimated that after paying interest on capital, burdens, and maintenance the balance put into a sinking fund would pay off capital expenditure in about thirty-three years.

Mr. Wike said that in Sheffield they were clearing five acres of land and spending 80,000l. or 90,000l. on a scheme of artisans' dwellings, but the fear was that if they put up these model dwellings they would not be occupied. Yorkshiremen and Lancashiremen, too, were averse to living a number of families under one roof, and preferred to have their own separate house. The Corporation had previously put up cottages which were let for 3½ to 4 per cent.

Mr. E. P. Hooley, Nottingham, urged advocates of huge flats to pay a visit to Nottingham

where they would see buildings which ought to be an example and a warning to them. About twenty years ago they erected certain buildings at a cost of 78,000l. Two of the blocks had never had a single soul in them, and one had now been pulled down. The fact was that these houses might be well enough for Scotland, but would not do in England, where the people would not be herded together.

Mr. McBair, Lincoln, complained of the many restrictions put upon these schemes by the Local Government Board, which made it difficult, if not impossible, for Corporations to carry out schemes.

Mr. Paton, Plymouth, said that with the scheme they were carrying out in that town there was bound to be a considerable charge upon the rates. That presented a very awkward problem to a Local Authority. Why should a Corporation build houses and compete with the builders out of the pockets of the ratepayers?

Mr. Turnbull, Greenock, said that their scheme was carried out twenty years ago at a cost of 200,000l., and was now costing the ratepayers a rate of 5d. in the pound.

A vote of thanks having been accorded to the author, the meeting adjourned.

At the mid-day adjournment, the members were entertained to luncheon in the Royal Hotel by the Lord Provost and Council; and in the evening the annual Association dinner was held in the same building, under the presidency of Mr. O. Claude Robson.

Baillie Sloan proposed the toast of the "Association of Municipal and County Engineers."

The Chairman, in responding, expressed his gratification that the Association was increasing in numbers, prosperity, usefulness, and influence. Another subject of congratulation was the increasing number of graduates and the ever-increasing popularity of the examinations, which were perhaps the most useful work performed by the Association.

The proceedings of the annual meeting of the Association were resumed in the Yellow Room of the Royal Hotel on Friday, July 1.

#### Biological Treatment of Sewage.

Mr. T. Cole, Secretary, in the absence of the author, read a paper by Mr. D. Cameron, City Surveyor of Exeter, on the Biological Treatment of Sewage, of which the following is a résumé:—

He said it had been demonstrated beyond a doubt that, by bacterial treatment,

(a) Domestic sewage could be rendered perfectly innocuous and as clear as spring water without the necessity for using a grain of chemicals.

(b) That some of the foulest trade sewages in the country were equally amenable to this treatment.

To gain any desired degree of purification, in both cases, was only a question of filtration, after the sewage had been dealt with so as to render filtration practicable.

Not the least of the advantages of the bacterial system was practically the removal of the



sludge difficulty and the attendant expense. After one year and ten months' working at Exeter, and dealing with a flow averaging 54,000 gallons per day, the tank showed no sign of requiring the removal of the deposit, and the author was watching with interest how long it would be before any of it had to be removed, as he proposed to work it to its utmost limit.

For one year and eight months of working there was no provision for arresting the minute particles of the deposit coming away in the tank effluent, and which were deposited on the filter surfaces. There was, now provided, at the end of the tank, a channel for the deposit of these particles, and although not sufficiently long under observation, there was an apparent reduction in the number in the effluent.

One of the most notable points observed in the Exeter tank had been the hitherto unrecognised energy stored in sewage, as evidenced by the production of marsh gas.

The permeating power of the gas was another new feature. The concrete arch of the tank was at no place less than 6 in. thick, that being again covered with 9 in. of soil; but the most delicate instruments failed to show any pressure in the tank, and it would appear as if it passed as easily through the concrete and soil as through an open pipe.

The works and public baths adjoining at Exeter had been lit with the gas and incandescent mantles. The gas was innocuous, and could only be detected ordinarily by applying a light.

The filters at Exeter had undergone another winter's work without any diminution in their powers of purification. As already mentioned, there were no means provided for preventing the humus from passing on to the filter surfaces, but, notwithstanding this, the depth of filtrant that had been scraped off since the filters were set to work was less than an average of 2 in.

The automatic gear upon which the efficiency of the filters depends had worked without a hitch, entirely dispensing with manual labour.

Mr. Greatorex, West Bromwich, said he had prepared a scheme for dealing with the sewage at West Bromwich at the rate of about 2,000,000 gallons a day on the identical lines of those at Sutton. The scheme had been adopted by the Council, and, before leaving there, a letter was received from the Local Government Board sanctioning the scheme under certain conditions. The conditions were similar to those at Edinburgh, requiring that the effluent must be run over a certain area of land, and giving seven years for the loan, but promising an extension if the scheme were a success. He proposed a vote of thanks to Mr. Cameron.

Mr. Lemon, Southampton, said he wished that Mr. Cameron had been present so that they might have discussed the paper more fully in his presence. He had been to Exeter with the Medical Officer of Southampton, and by the kindness of Mr. Cameron they took samples from the septic tank and from the filter, and the result of their analysis showed that there was little or no improvement from the septic tank; in fact, the sewage was worse than before, but there was a very decided improvement from the filters. There was no difficulty in producing a clear effluent from domestic sewage by ordinary filtration, but he believed it would be a very different matter when they had to deal with trade refuse in the manufacturing towns. The treatment of trade refuse meant the use of chemicals. The septic tank was really their old friend the cesspool, and if the excreta were broken up and the minute particles passed away in the effluent, as he had no doubt they would be, this septic tank would go on for a long time and not require emptying. Then as regarded the marsh gas, he did not consider it desirable for a municipal engineer to manufacture marsh gas. He had some discussion when at Exeter about that, and one gentleman was unkind enough to call it the Exeter gas-holder. He would not call it that, but he must say he was not impressed with this manufacture of gas. He looked upon the system with very much doubt; and, with regard to patents, he considered, speaking with thirty years' experience, that the practical effect of many of these inventions had been to retard the proper disposal of sewage. They must look upon this matter with a certain amount of suspicion, especially when they knew it was a case of making money for the inventors. He would like to go so far as to make it illegal for any man to patent anything affecting the public health, and they would then soon stop these fads.

Mr. McBrat, Lincoln, regretted that the

paper did not go into figures of cost, and pointed out that sewage could be treated bacterially by other processes than the septic tank.

Mr. Pickering, Nuneaton, thought it a step in the right direction for the Local Government Board to sanction a loan, so that the system could be tested under proper conditions. He could bear out the statement as to foul sewage being amenable to treatment. Notwithstanding Mr. Lemon's scepticism, he could assure them that he had had a coke breeze filter in operation for four months treating one of the most foul sewages in the county, and the results had been gradually improving, and were now better than at the commencement. This proved that manufacturers' refuse was to some degree amenable to this bacterial treatment.

Colonel Jones regretted Mr. Cameron's absence, and said he was disappointed with the paper which had been put before them. There was some truth in it, but that was old, and what was not old was not true. They all knew that domestic sewage could be treated, and had always known it. The results with regard to cesspools and the production of marsh gas they had always known, and had been accustomed to consider them very offensive. The object of taking sewage away from towns was to prevent the marsh gas getting into the houses. With regard to the automatic process at Exeter, upon which alone it was patented, he complained that it was not justifiable to say there was a great saving in the arrangement. Personally he preferred good and intelligent hand labour in anything that had to do with sewage. Sewage had a tendency to clog and stop up when worked by mechanical arrangement. He thought that would be found to be the bad feature of the system, and, at any rate, it would not save much. He looked upon Mr. Cameron as a most honourable and upright man, but he had the greatest suspicion when sewage got into the hands of a company to make money of.

Mr. Campbell, Canterbury, regretted exceedingly that in the absence of Mr. Cameron aspersions and suggestions of the kind should have been brought forward in connexion with the paper. He went to Exeter with an unprejudiced mind, and after investigating the system, he had constructed a tank on the Exeter lines, and it had produced a wonderfully clarified effluent from a very bad sewage.

Mr. Smith Saville, Darwin, said he had constructed a tank on similar lines, which had been working for three months, and had reduced the quantity of sludge to one fourth. The effluent from the tank, however, had never been so good as to justify him in having it analysed. The effluent was of a milky colour, and there were slight particles in it. He allowed it a fifteen hours' flow through the tank to enable it to clarify, and then passed it through two coke filters. The filters took an hour to fill, the effluent remained on them two hours, was then run off and allowed to aerate for two hours. The effluent from the filters was not very good; not so good as with the ordinary coke and sand filters.

Mr. Wike, Sheffield, said he was carrying on experimental works consisting of thirty tanks, each holding 500,000 gallons. For a long time they obtained no good results whatever, and for several months thought they were going to have a failure, but he was pleased to say they were now getting a good effluent.

The President said he thought it was very gratifying to the Association that they should have some record of this interesting process of sewage treatment. There was one very important point upon which they ought to get definite information from Mr. Cameron. He did not wish to associate Mr. Cameron with £ s. d., but he did not perfectly understand whether this 30 per cent. royalty commission was on the whole of the constructive works, tanks and filters, and everything.

The vote of thanks was accorded with acclamation.

Mr. J. B. Wilson, Cockermouth, read a paper on a "Two hours' test of a steam rain pumping plant." Mr. F. A. Newington, Resident Electrical Engineer, contributed a paper on the electric lighting of Edinburgh, which showed that the system had proved a great financial success, and Mr. Peter Whyte, C.E., Docks Superintendent, read a paper on "Recent Extensions of Leith Docks."

At the conclusion of the business proceedings, Mr. W. N. Colam, Engineer for the Edinburgh Cable Tramways, entertained the members to luncheon at the Royal Hotel. The afternoon

was devoted to visits to the artisans' dwellings, electric lighting works, the cable tramway power station, the McEwen Hall, and the Free Library; while a second party visited the refuse destructor, the Leith docks, and other public works.

The third day of the meeting was devoted to a visit to the Forth Bridge; and to various places of interest in Edinburgh. The meeting was altogether one of the most successful in the annals of the Association, and the arrangements were admirably made for the comfort of the members by the Secretary, Mr. T. Cole, and his assistant, Mr. H. A. Giles.

## Books.

*Later Renaissance Architecture in England: a Series of Examples of the Domestic Buildings Erected Subsequent to the Elizabethan Period.* By JOHN BELCHER and MERVYN E. MACARTNEY. Parts I. and II. London: B. T. Batsford; 1897.

THE supplementary title of this book defines the meaning of the first or main title; otherwise it would be rather a surprise to most readers to find the "later" Renaissance commencing with Inigo Jones. The authors regard Elizabethan as the earlier Renaissance, but the fact is it has little in common with what is usually called Renaissance architecture, and is much more nearly allied to Gothic, and we have always been in the habit of regarding the Renaissance as having commenced much later in England than in Italy or France, and having its real commencement with Inigo Jones and Wren. It is only a question of nomenclature, perhaps; but it is as well there should be a common understanding as to nomenclature.

As the literary portion of the work, except a short introductory chapter, is relegated to the later numbers which have not yet appeared, one can only say of these two first parts that they contain a good many photographic reproductions of buildings of the period included, some of them celebrated, others not, for the authors have rightly judged it is as desirable to illustrate small and little known buildings which have good qualities, as larger and more familiar ones. A small proportion of measured drawings (about one-fifth of the whole illustrations) are included. The plates are about the same size as those in Mr. Gotch's book, and the photographic plates are in the same style of execution; this book being evidently intended as a complement to or continuation of Mr. Gotch's publication.

There are one or two points not entirely satisfactory in the carrying out of the publication, so far. In the first place, the authors lay special stress, in their prelatory address, on the fact that, during the period of which they are treating, buildings first became, in this country, connected with the names of individual architects who were regarded as their authors, and that this gives a special interest to the buildings. Yet we observe that, although the first two parts contain illustrations of several celebrated buildings whose architects are well known, the name of the architect is not in any case given on the plate, as it certainly should be, nor is it to be discovered anywhere in the already published parts. Secondly, the publisher's notice to subscribers states that it has been thought desirable to give as much variety as possible to each part, and therefore the plates here issued are not consecutive, and one plate only of a building which is to be illustrated by several is now given. This is a somewhat irregular way of issuing a book, and the publisher can hardly be surprised if people are disposed to regard this as a little *ruse* to compel subscribers to take all or none. But at all events the names of the architects, where known, ought to have formed part of the plate title, instead of giving the reader the trouble, eventually, of turning for them to a description on another page, which has not even appeared as yet.

*The Training of a Craftsman.* Written by FRED. MILLER; illustrated by many workers in the Art Crafts. London: Virtue & Co.; 1898.

This is an interesting book for those who know something of the conditions of decorative art, and a useful one for those who do not. The author takes various forms of art-work in



separate chapters, going briefly through the nature of the materials in each, the method of working them, and the kind of design for which they are best suited. But a prominent object in the book is to suggest the elimination of the "designer" as a separate person from the actual craftsman; to lay down the principle that the designer and craftsman should in all cases be one, and that the man who with his own hands works the metal or the clay or the mosaic, or whatever may be the material in use, should make the design almost as he goes on, or as the handling of the material suggests its treatment. And one better reason is given for this view than we have generally seen put. It is practically impossible, says the author, to make a design on paper, say for a repoussé cup, which shall bear any close resemblance to the cup when beaten; and unless this is borne in mind the apparent poverty of a working design induces the designer to endeavour to obtain richness by elaborating the design on paper, with the result that, when carried out, the work is wanting in simplicity. That is a very good way of putting the argument, and suggests the reason for a good deal of over-conscious and pretentious design in architecture as well as in decorative detail.

The position, however, must not be pushed too far. It is quite possible to make designs on paper which will be effective in execution, and which will be in some respects superior to design wrought out under the maker's hand. The defect of the one is likely to be want of spontaneity; but the defect of the other is likely to be, and often is, want of refinement and balance, and there are instances of this among the examples given to illustrate the book.

This is exemplified in the illustration of a carved wood capital on page 31, from a wooden fireplace in the Arts and Crafts Exhibition, which the author tells us was condemned by some architects because it did not follow the customary shape of a capital. We do not know how far that is a correct representation of the criticism, but there is a much better reason for criticising it than that, viz., that it is a mixture of conventionalism and naturalism, and that the junction of the angle twigs with the central columnar stem is utterly weak and unconstructive.

In general, however, the advice which is given, and the examples of work with which it is illustrated, represent sound and true artistic teaching. It is going rather too far in regard to wrought iron work, however, to say that the properly ornamental part of the work should be founded on natural forms. In a material so suggestive in regard to form as wrought iron, this does not necessarily follow. What is really important, and too often neglected, is that conventionalised and naturalistic foliage should not be mixed in the same work. It may be a question whether naturalistic forms should be admitted at all, but if they are, the naturalistic principle must govern the whole of the decorative portions.

The striving after originality for its own sake is apt to lead to mere eccentricity, as exemplified in fig. 122, the bookbinding design called "Peacock and Fountain," which is little better than a scribble of lines destitute of beauty, and almost of intelligible suggestion. Such work cannot be dignified by the name of "design" at all, in the true sense. The same binder's design for Pater's "Renaissance," fig. 121, is a really good piece of novel decorative design.

The subjects treated in the book are "The Craftsman and Nature," "Design and Craftsmanship," metal-work, jewellery, enamelling on metal, potters and painters, glass painting, wood carving, bookbinding, women workers in the art crafts, surface decoration, decoration in relief, wallpapers and textiles; concluding with a chapter on "The Craftsman up-to-date and his outlook." In this concluding chapter Mr. Miller says truly that the condition of things is much better than it was twenty years ago; that a good craftsman has a much better chance of recognition than he had; but there is still much to be done before the public generally will recognise the fact that it is the personal element which gives interest to a work of art, and we cannot hope for the full development of this until the personal claim of the actual worker is more generally recognised.

We cordially recommend Mr. Miller's book to the attention of those who are interested in artistic crafts, and those who mean to practise any one of them.

*Bell's Cathedral Series.*—*Peterborough.* By REV. W. D. SWEETING.—*Norwich.* By C. H. B. QUENELL. London: Geo. Bell & Sons, 1898.

MR. SWEETING'S long study of Peterborough Cathedral has enabled him to produce a most reliable and trustworthy handbook. He gives a plan of the eastern end of the Saxon cathedral, nearly as given in our plan of the Cathedral given under date August 4, 1891, only that the Saxon wall is shown under the western half of the later piers, instead of being a central foundation for them. Our own plan is, we believe, the correct one, or at all events more so than the one given by Mr. Sweeting. The western aisle, added later to the south transept of the Norman church was no doubt a treasury; accessible, as at Winchester, by an internal doorway only. Mr. Sweeting describes fully—we are glad he does not praise—the new marble pavement of the presbytery. Beautiful in itself, it makes the homely stone of the ancient cathedral look common and mean. The author approaches with bated breath the vexed question of the chronology of the nave; on which Messrs. Poole, Paley, and Craddock have evolved irreconcilable theories; all equally impossible. The only way out of the Peterborough difficulty is to recognise frankly that the monastic chronicler was either misinformed or was deliberately untruthful. It is impossible that he can be correct in saying that the nave was built by Abbot Benedict between 1177 and 1193. The fact is, Benedict was a great favourite at Peterborough; he had brought to Peterborough much booty from Canterbury; in particular the slabs stained with Becket's blood. On the other hand, his predecessor, William of Waterville (1155 to 1175), had involved the monastery in vast debts, no doubt by the magnitude of his building operations, and had been deposed in consequence. It would be quite in consonance with the historical conscience of a monastic chronicler—as frankly avowed by Matthew Paris—to detract from the work of the unpopular, and to add to the work of the popular Abbot. The west front is said to be inspired by that of Lincoln, but it is more likely that it is a magnified version of Abbot John de Cella's porches at St. Albans; it may even be by the same architect, for Abbot Acharius of Peterborough (1201-1214), who may well have commenced the west front, had been Prior of St. Albans under John de Cella.

Mr. Quenell's handbook to Norwich Cathedral is also well done; it is clear, full, and accurate. It is amusing to notice the conservatism—we might almost call it the pig-headedness—of the monks of Norwich and Peterborough. The monks of Norwich would never have copied in their choir the clearesty of Gloucester choir, had not their Norman clearesty been battered down by the fall of the spire in 1361. Great fires occurred in 1170 and 1272; but still the monks clung to their wooden ceilings, and would not safeguard their church against fire. It was not till the fire of 1463 that they commenced the high vaults of the nave and choir; and another fire was required in 1509 before they would vault the transepts. Peterborough was exceptionally exempt from such calamities; and the monks there retained to the end their wooden ceilings. And though the eastern limb must have been one of the most inconvenient in the country—the apse having no processional aisle—it was not till the middle of the fifteenth century that they commenced in the "New Building" the eastern extension, which at Canterbury had been commenced before the end of the eleventh century. Speaking generally, we may say that in architecture all the Canons, whether secular Canons, as at Lincoln, Salisbury, Beverley and Southwell, or regular Canons, as at Bristol and Ripon, were Progressives; while most of the monks, especially those of Peterborough and St. Albans, were high and dry Tories. It is astonishing what a difference there is in the contemporary twelfth century work of Glastonbury and Wells, with only five miles of marsh between them.

*Specifications for Building Works, and How to Write Them. A Manual for Architectural Students.* By FREDERIC R. FARROW, F.R.I.B.A. London: D. Foulrisher and Whittaker & Co. 1898.

THIS, which forms one of "The Builder Student Series," is mainly a reprint of a series of articles which appeared in the "Student's Column" of the *Builder*, now issued, with some revision

under the name of the original author. Under these circumstances we cannot, of course, pretend to enter into a criticism of it on the usual lines. We believe it will be found to be a trustworthy guide for young architects as to the matter and manner of specifications, and possibly older practitioners may find it useful as a reminder of things sometimes forgotten, or as containing some new and useful hints.

In his short preface Mr. Farrow is careful to point out that the examples given are intended as illustrations, not as precedents to be exactly copied in every instance. "There is a bad practice existing in many architects' offices of copying old specifications, with some modifications, for new work. Such a practice leads too often to the omission of important items, to the inclusion of irrelevant matter, and to vague and indefinite description." On the other hand, a skeleton draft specification, avoiding such details as must and ought to vary with different buildings, may be useful as ensuring that no class of work is overlooked, and preserving a definite form and arrangement of the whole.

We may call attention to Mr. Farrow's remark, in the introductory paragraphs on "general principles," that precision is one of the most important qualities in specification writing; and that the proper person to compile the specification is the author of the design, if he knows with precision, as he should, know all about its intended construction. "The practice of deputing this work to another" (which we fear is only too common now), "be he quantity surveyor or assistant, is one that is discreditable to any architect worthy of the name, must result in a loss of efficiency, and often breeds future trouble out of all proportion to the relief that appears to come from shirking the initial duty." Indeed it may be said that the architect who writes his own specification benefits himself most of all, for in the course of doing it he is compelled to think out every detail of the construction in a manner which he might not otherwise have done, and sometimes becomes conscious of defects or points to be considered, which he might have overlooked in making the design.

Some readers will perhaps think that the recommendation on page 9, to keep together in a specification all the adjuncts of each portion described, instead of grouping them under trades, is open to consideration. The common practice in the present day (in London and the neighbourhood, at all events) of having only one responsible contractor for the whole work, renders this system possible. Thus, Mr. Farrow says, "in describing a door the linings, architraves, and ironmongery should be included." But will this promote brevity (which the author rightly says is a virtue of specifications) so much as describing the door furniture *en masse* for different classes of doors? It may also be urged that the door furniture is a class of work usually purchased by the contractor at one time and from one firm, and at a late period of the work, and that it will be more convenient for his business to have it all grouped together in the specification. Some architects would probably say also that it is more convenient, in writing the specification, to give the mind to one class of work at a time. Locks, latches, and handles, are necessary appendages of doors, no doubt, but they belong to a different class of work and are made by a different class of persons. As far as the architect is concerned, it is a point which each will probably settle for himself, according to his own habit of mind and his own system of working. It might however be of some interest to know which method contractors prefer, unless it be considered that the bill of quantities does the grouping for the contractor, and renders him indifferent to the method of arrangement followed in the specification.

The importance of detailed and precise specifying in regard to excavator's work is rightly insisted on, and the advice, we suspect, is by no means superfluous. As the author observes, "More contracts are lost and won, and more unsuspected profits made, on the excavator's trade, than probably on any other in the bills of quantities." Yet we fear the excavator's work is too often regarded as a kind of vague and indefinite problem which will settle itself on the ground.

*The Stones of Venice.* By JOHN RUSKIN. New Edition in Small Form. London: Geo. Allen; 1898.

WHEN the re-issue of the larger edition of the



Stones of Venice was made we expressed our opinion, in an article under date August 25, 1888, on the futility of solemnly re-issuing a book which, as far as its pretending architectural teaching is concerned, is nothing but a medley of absurdities, and there is no occasion to go further into the subject in noticing this cheap edition. When the public begin to find out a little more as to what architecture really means, whether from the point of view of history or of criticism, they will discover that they have been befooled by a writer possessed of exceptional rhetorical power, destitute of logical faculty, and with no real knowledge of his subject; and the result will be, to repeat the words with which we concluded our former article, that "if there are second-hand booksellers in the twentieth century, they will probably have a good many copies on sale of an æsthetic treatise in three volumes, which will be 'bad stock,' only saleable for the beautiful execution of many of the illustrations." It may still take the public a few years longer to find out the truth, but when they do they will take their revenge.

*The Art of England and the Pleasures of England.* By JOHN RUSKIN. New Edition in Small Form. London: Geo. Allen; 1898.

THIS is another republication in a cheap form of a work originally published about fifteen years ago. There are scattered about in it brilliant thoughts about art and artists, amid a quantity of incoherent writing. It includes some suggestive remarks on the true powers and limitations of wood engraving (in the chapter on Leech and Tenniel), and a recognition of the great historic value of Viollet-le-Duc's writings in giving, while ostensibly teaching architecture, so vivid and detailed a picture of European life from the eighth to the twelfth century. It includes, too, such absurdities as the suggestion of the derivation of the Norman zigzag ornament from the indentations in the conventional treatment of the fringe of hair in a Greek female bust, and the argument that the weather of England has permanently deteriorated because the author found that he could no longer work in a garden with his coat off in the month of May. The grouping together of Mrs. Ailingham and Miss Kate Greenaway as joint representatives of the treatment of children in art is very unjust to the former lady. The volume is full of that attitude of conscious superiority with which Mr. Ruskin always addresses his audiences. "I have before told you"—"I wish you to read what I have said on" such a subject, and so on, as if all wisdom and knowledge were in his own hands. For this dogmatic attitude Mr. Ruskin's followers and auditors are, in a sense, as much to blame as himself; in their blind adulation they seem to take a kind of pride in being lectured by him like so many children. If any of them had had the spirit to say plainly that they could think for themselves and that they differed from him on this or that point, he would have been compelled to modify this arrogant and dictatorial attitude. His own particular section of the public, however, seem to have simply laid themselves before him to be trampled on, and we presume they have their reward; but it is a sufficiently absurd spectacle.

*Architecture among the Poets.* By H. HEATHCOTE STATHAM. London: B. T. Batsford. 1898.

THIS little book is mainly a reprint of a series of articles contributed to this journal by the author a good many years ago, consisting of quotations of and remarks upon the various references to architecture in English poets, from Chaucer to the present day. The work has, however, been re-written and revised, and to some extent added to; and the whole is got up in rather an ornamental form in keeping with the character of the subject.

Some of the poets quoted are little known or read now, and in regard to the greater of the moderns it has not perhaps been generally noticed how remarkably true Tennyson and Browning (the latter especially) are in their poetical references to architecture.

The various quotations are made the occasion of a certain amount of architectural and literary criticism, arising out of the language used by the poet or the view of the subject taken by him. It will be found, as the quotations made amply show, that the understanding of and interest in architecture on the part of poets has

developed very much in modern times, and in fact that almost all the best passages, and those which show most critical and artistic perception, are from poets of the present century, though there are some interesting examples from older bards.

*Fire-Resisting Floors in London.* By FREDERIC R. FARROW. (British Fire Prevention Committee.)

THIS, which is one of the series of pamphlets issued by the British Fire Prevention Committee, is a most useful one for young architects especially, as it gives a kind of synopsis of all the forms of fire-resisting floor construction at present available in London, with sectional diagrams of each. The author has purposely abstained from criticism, his object being to give information.

#### TRADE CATALOGUES.

MESSRS. WALLACH BROS. (London) send us a description and drawing of their patent "Humidifier," the object of which, as its name implies, is to supply moisture to keep the air moist, a very important point in many factories, where the proper handling of the material often depends on not having too dry an atmosphere. In the Wallach Humidifier steam alone is used, as the form in which moisture is most naturally absorbed by the air, and the patentees state that by their instrument the steam is discharged noiselessly, and the rate of distribution can be varied according to requirements. We have received the new catalogue of Bullock's Lead and Glass Works Company (London). The designs for embossed glass figured in it are much what is usually seen; those for figured rolled glass include some effective and characteristic patterns, and some of those of the enamelled sheet glass are also very pretty. The practical part of the catalogue includes varnishes and painters' materials and imple-

ments; a large selection of closet basins, the illustrations of which, however, would be more useful to architects if sections were given—no architect will select ware of this kind on the strength of a mere picture of its external appearance, though this may be all that builders or the general public require; water-waste preventers, plumbers' work generally; iron baths; gas baths; geysers; taps, lavatory fittings, ranges, grates, &c.—Kiessling's Wood Working Machinery Catalogue (London agents, R. Becker & Co.) is a phenomenal catalogue of this kind for variety and completeness and the fine character of the illustrations. It appears to include every kind of instrument that can be mechanically used in woodworking, and the illustrations, which are too numerous and various for us to refer to in detail, convey at all events the impression of first-rate and solid make and construction, qualities on which the firm specially pride themselves.—Mr. Duncan Tucker (South Tottenham) sends his illustrated catalogue of horticultural buildings of every description. Views and sections are given of various forms of conservatories and greenhouses, large and small. There is also a detail section of Tucker's anti-drip bar for roofing, the special point in which is that the grooves are below and not in close proximity to the glass, so that they can be got at for cleaning. Boilers, hot-water pipes and connexions, pumps, and other horticultural plant, are included.

#### BOOKS RECEIVED.

PROBLEMS OF MODERN INDUSTRY. By Sidney and Beatrice Webb. (Longmans, Green & Co.)

#### Correspondence.

To the Editor of THE BUILDER.

##### TINTERN ABBEY.

SIR,—I was glad to see the interesting account of the Abbey in your issue of July 2.

Having known Tintern for five and forty years—before any steps were taken to clear away the rubbish and superfluous ivy—and having many times gone over the buildings stone by stone with my old friend the late warden, I am able to appreciate the article, and should be glad to supplement it in one or two particulars.

The suggestion as to the position of the first church is one which I worked out in a paper for the Bristol and Gloucestershire Archaeological Society several years ago. My plan, of which I send a copy, shows how the later work in the north-eastern corner of the transept was affected by retention in its place of the old choir until the new choir was ready, or even longer. All the details of the north-eastern part of the transept differ from the other details, and there are at that spot two flying buttresses, no others being used in the building.

In Mr. Paul's sketch showing "Hatch between Frazer and Kitchen" there is a sunk panel in the wall to the left of the hatch. This contained a turn-up slab, hinged at the bottom, which when let down would carry utensils that were on their way to or from the kitchen. The two hooks for the hinges are still in their places.

THOS. BLASHILL.

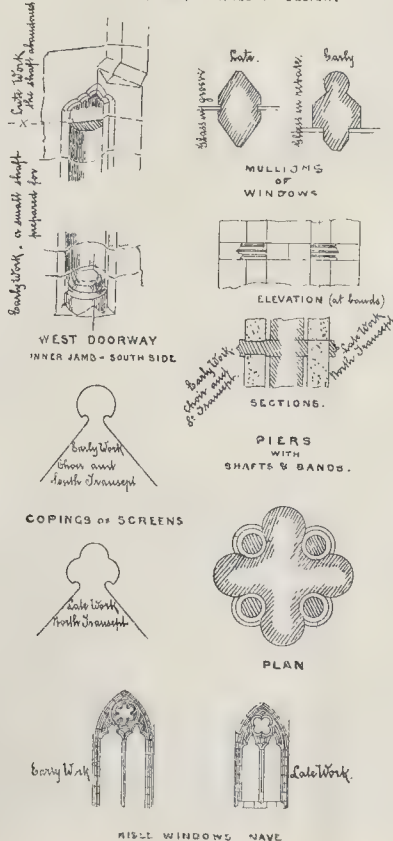
##### TUDOR STREET ANCIENT LIGHT CASE.

SIR,—A few words in reply to Mr. Beresford Pite's letter seem necessary, because he is in error in stating the decision "seems to establish new data for the practice of surveyors." I was surveyor for the plaintiffs, and the action taken was under my advice.

I would point out that the mere recital of distances cannot enable anyone to form an opinion as to whether there is, or is not, an injury. It is only fair to Mr. Justice Kekewich

#### TINTERN ABBEY.

DETAILS—SHOWING CHANGE OF DESIGN.









PHILOSOPHIE DE L'HISTOIRE - M. ROCHES, SCULPTOR



THE CLARKS MONUMENT, TO BE ERECTED AT CONDE SUR AIS - M. GAUCHER, SCULPTOR



JEUNES FANGEURS - M. VITAL COUDÉ, SCULPTOR





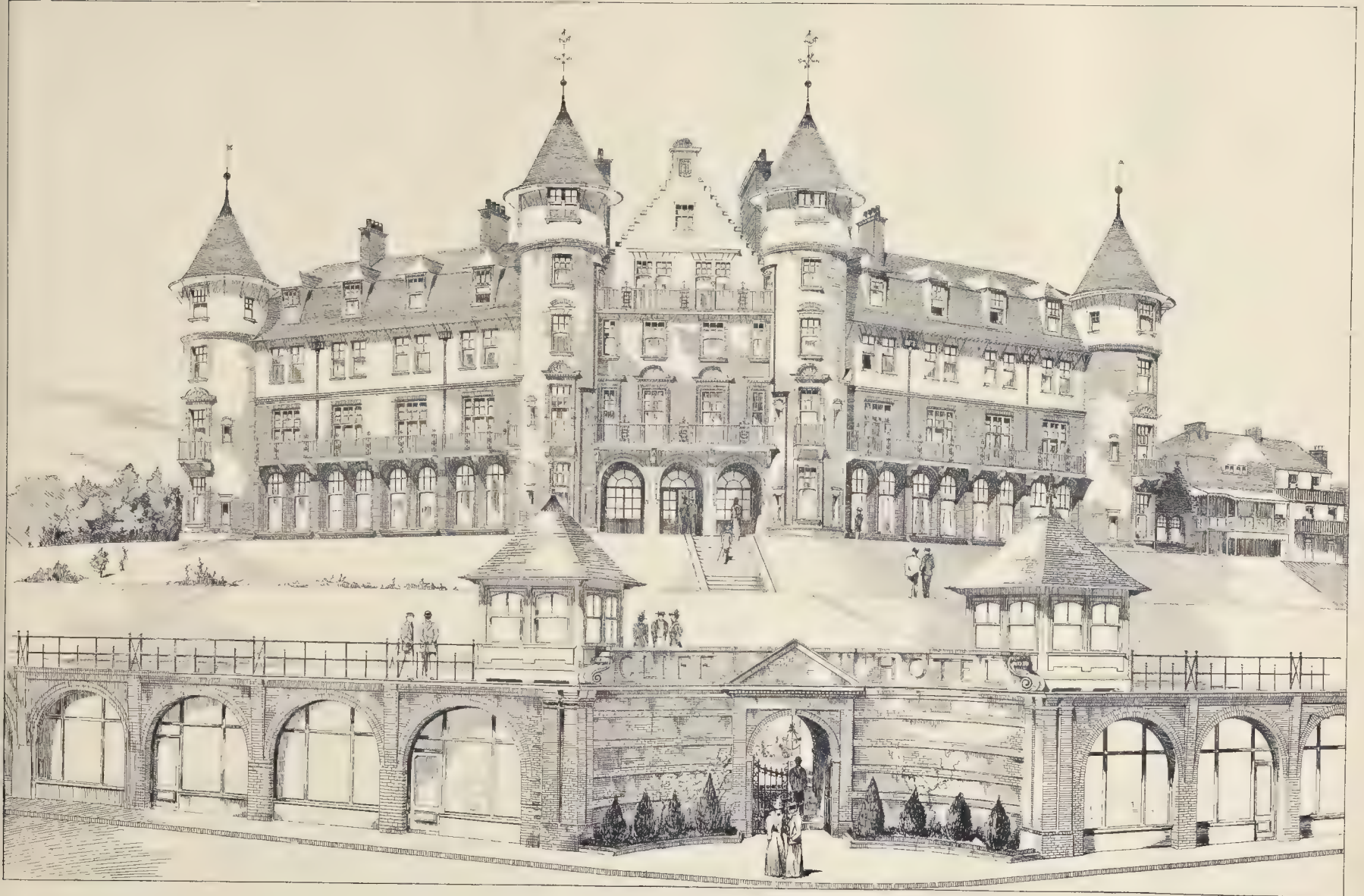
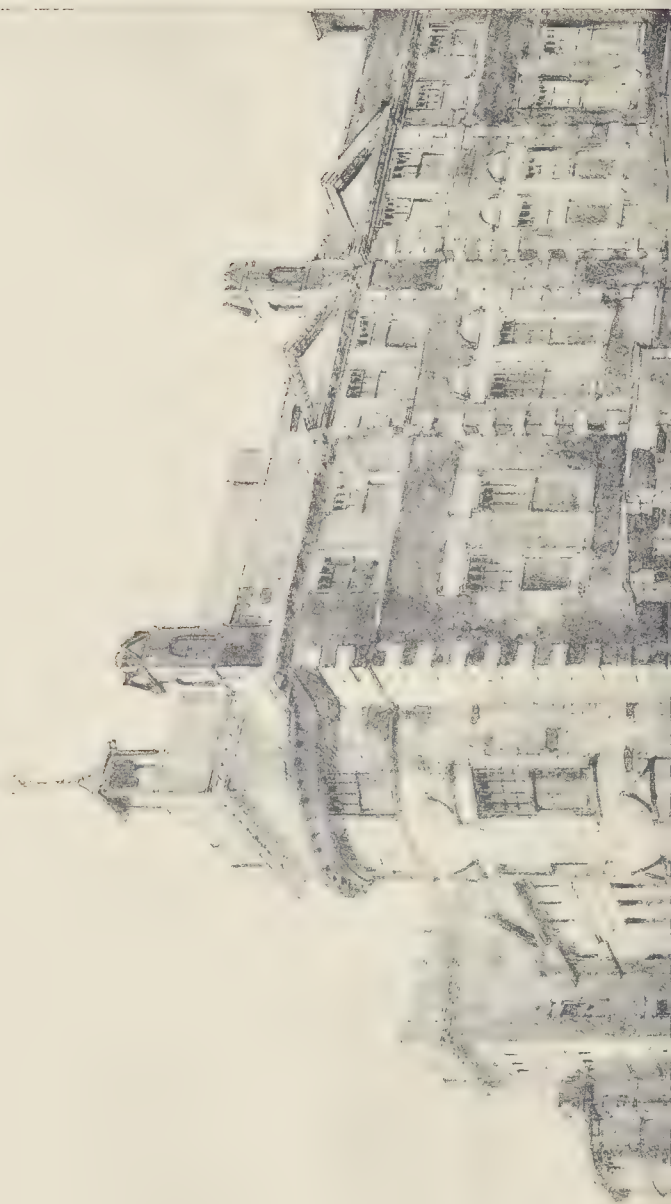


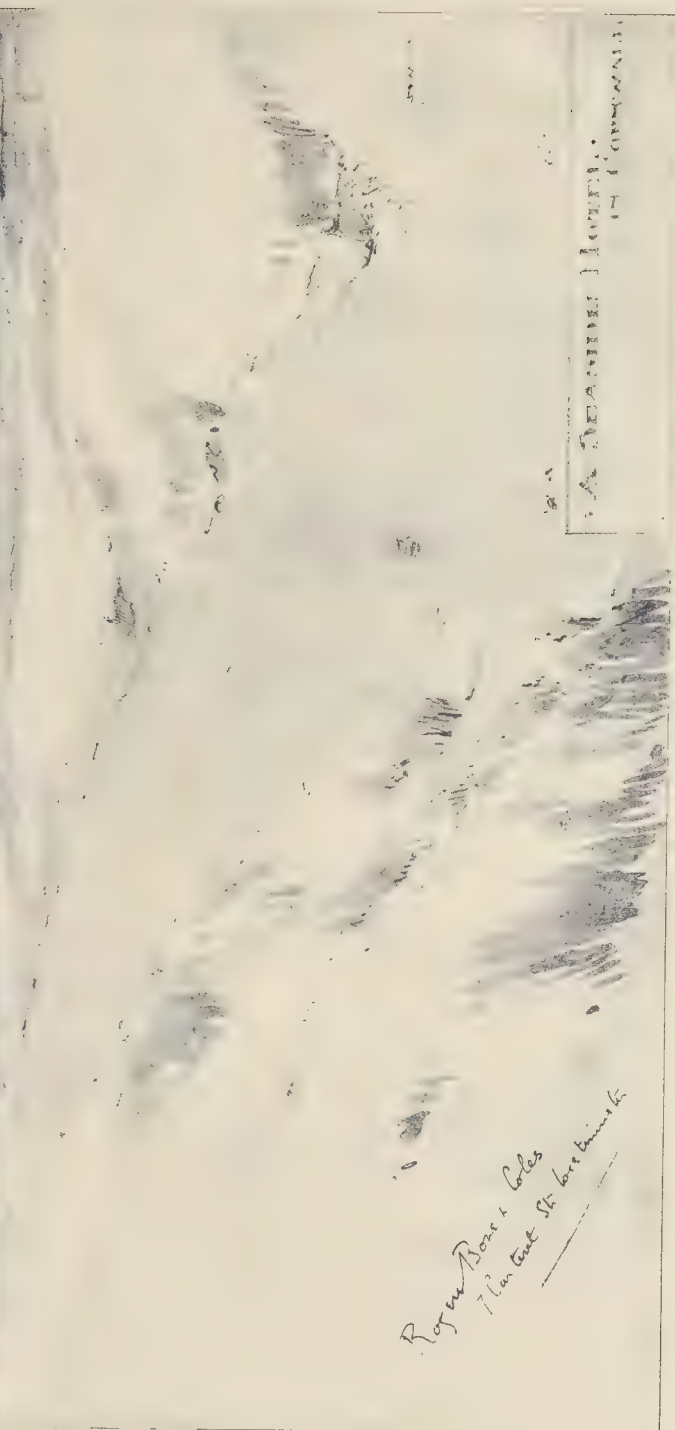
PHOTO. THE SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, LONDON, E.C. 4.

THE CLIFF HOTEL, GORING-ON-SEA - MESSRS G. J. AND F. W. SKIPPER, ARCHITECTS

THE BUILDER, JULY 16, 1898







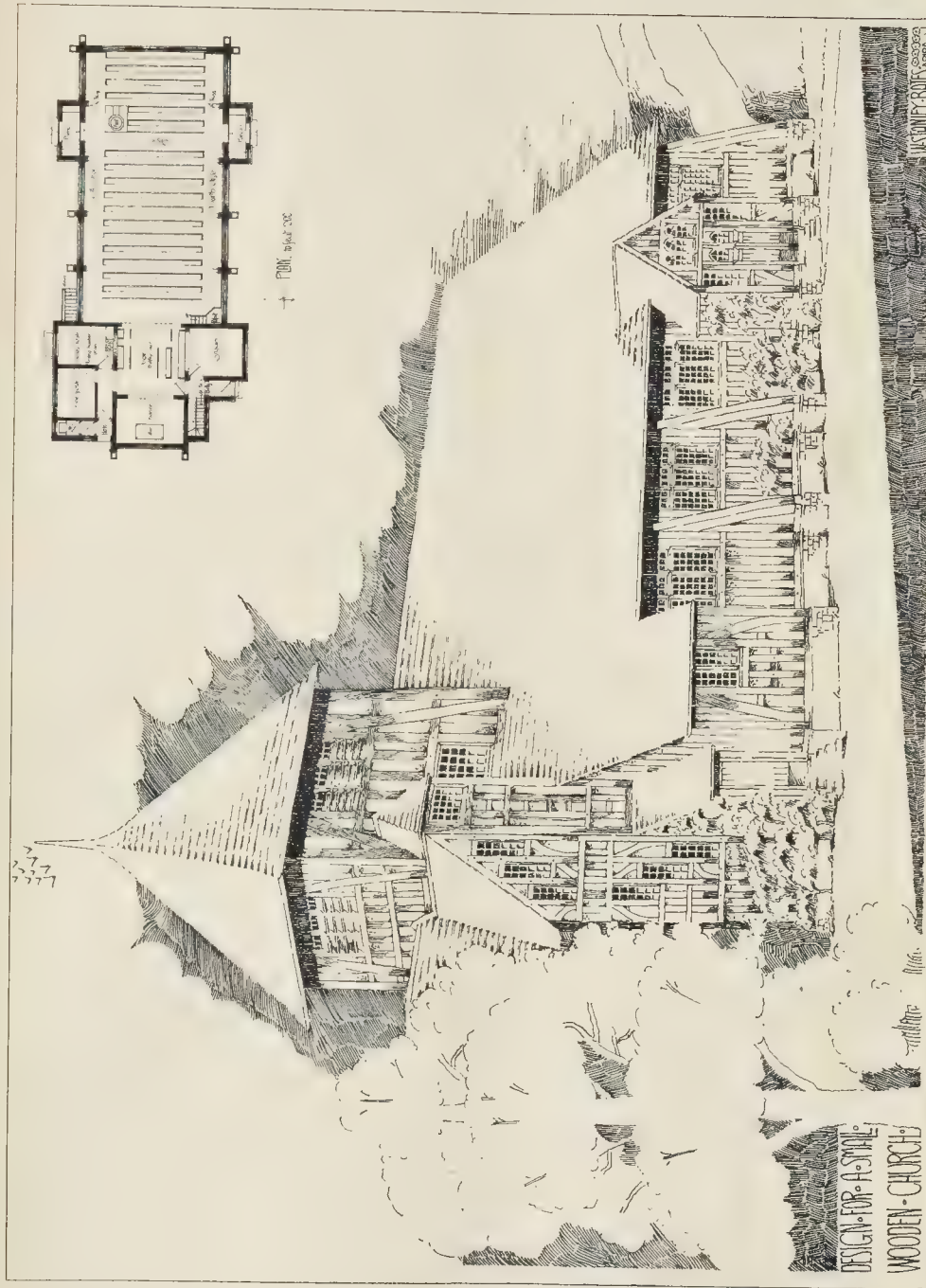
A DECADE HOTEL  
ST. LOUIS

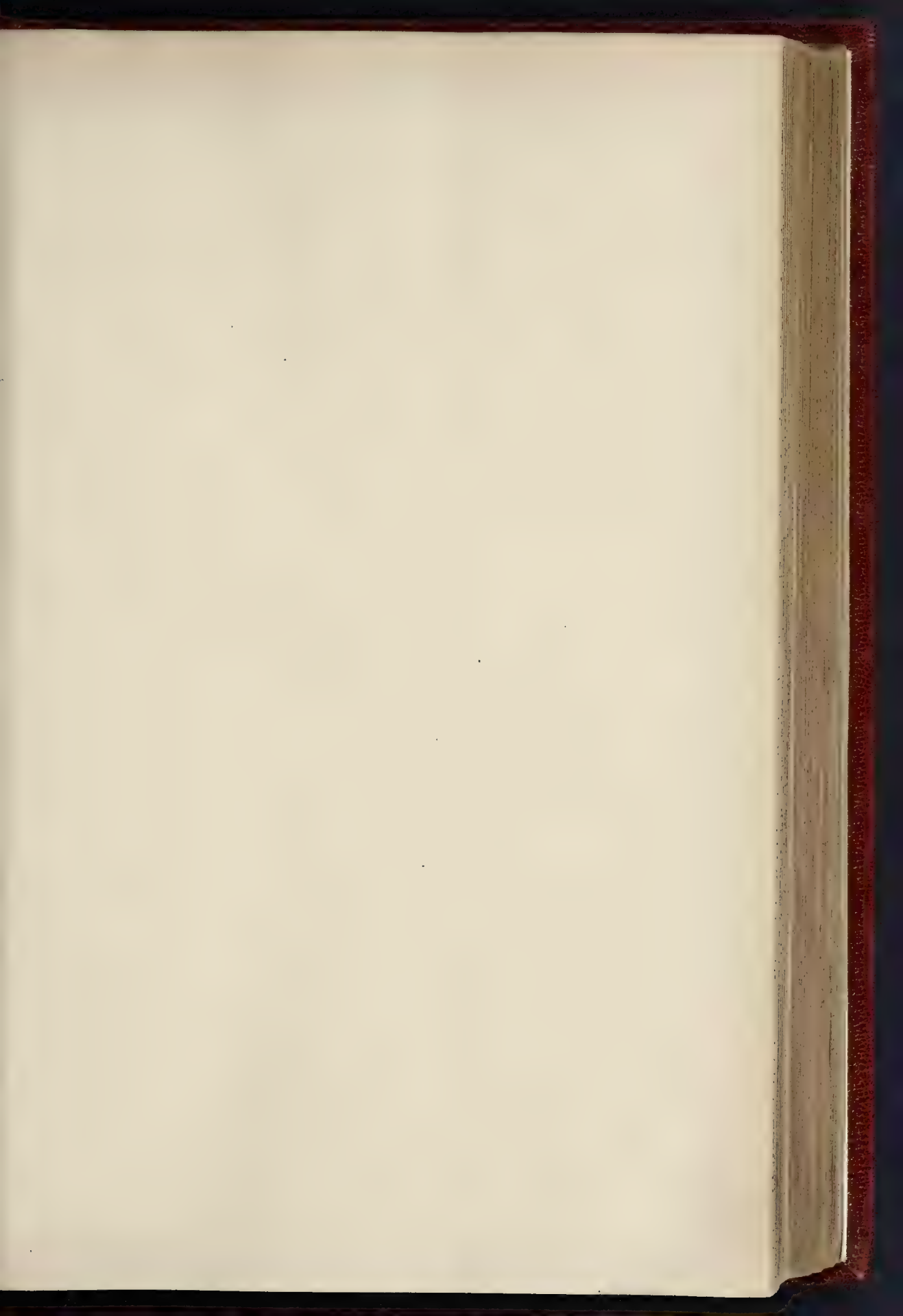
Rogers Bros & Coles  
714 Chest St. St. Louis Mo.





THE BUILDER, JULY 16, 1898.







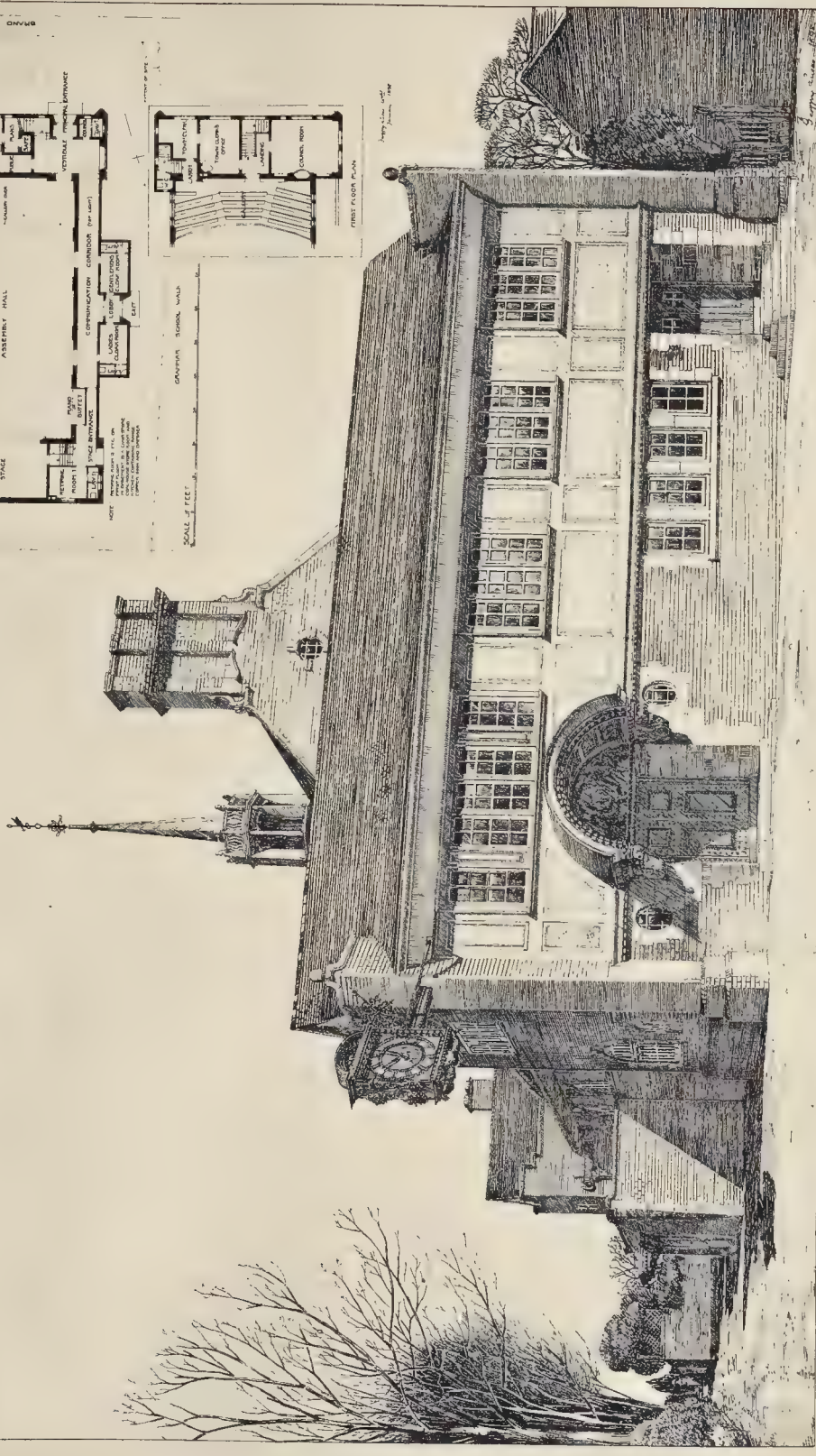
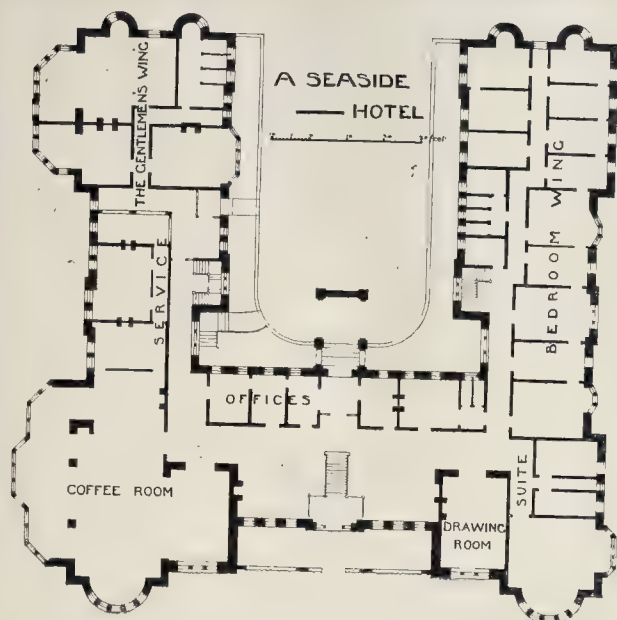


PHOTO LINDSAY & CO. LTD. 485 EAST HARDING STREET LONDON E.C. 4

NEW PUBLIC HALL AND OFFICES, HITCHIN, HERTFORDSHIRE.—MR. GEOFFREY LUCAS, ARCHITECT







A Seaside Hotel in Cornwall. Plan.

gardens and the entire sea prospect; and shelters and a pavilion for reading and smoking will be provided for rest and protection in case of rain.

A tennis lawn is laid out on the top of the cliff, also facing the sea.

The carriage entrance to the hotel is on the west front, and within a short distance inland is the site of the proposed railway station to be built by the G.E., and M. and G.N. railways on their new coast line from Yarmouth to Lovestoft, for which an Act of Parliament has already been obtained.

As to the hotel itself, the exterior, as shown in the view, is of simple treatment, reliance having been placed by the architects on the grouping and proportion for the main effects, whilst rough cast in the upper parts gives variety to the colour scheme, as red bricks and dark red tiles have been used for walls and roof. The west front has been designed in a slightly more domestic spirit, but the same treatment has been preserved; the main entrance on this front is by a low, wide archway of carved brickwork, surmounted by flint panel work and a parapet.

The interior provides a spacious central hall, having its sea-front entrance and windows under the three central arches shown in the view. The main staircase starts from this central hall, and a corridor runs from it on either side, giving access to the principal parts of the hotel—the lounge drawing-room, smoking-room, billiard-room, and gentlemen's lavatory on the one side; on the other side is the reading-room, and beyond this the dining-hall. The interior of the building has been carried out on the same simple lines as the exterior. The dining-hall is treated with wooden beams to the ceiling, wood-paneled walls, stone chimney-pieces (with dog-grates), wrought-iron gas-fittings; the upper parts of windows are glazed with lead glazing specially designed. The drawing-room is lighter in design, with carved wood chimney-piece, and lead glazing of different character, the woodwork being in an enamelled cream tint. In the hall the fireplace is of stone and oak under a broad arch with seats on each side; to the corridors are low and broad arches; the gas-fittings for the most part are of wrought iron; the lead glazing everywhere is simple, with rich colour in parts; the colouring for all the rooms reserved and quiet and with simple detail everywhere; and where decorative treatment is adopted at all, it is in special parts and of rich design.

The kitchen is in the basement, but the

greater part of it has an open roof for light and ventilation. The cooking is by a central range. Nearly all the walls in the basement are lined with Cockrill-Doulton glazed wall tiles, and every provision is made for the good service of the hotel in every department.

The general contractors for the hotel buildings are Messrs. J. Downing & Son, of Norwich. The shops and terrace below have been built by Mr. J. F. W. Bray, of Great Yarmouth. The furnishing throughout has been in the hands of Messrs. Trevor, Page, & Co., of Norwich; the stoves, ranges, and hot water service have been supplied by Messrs. Johnson, Burton, & Theobald, of Norwich; the ornamental glazing and the decorative painting were entrusted to Messrs. J. & J. King and to Mr. W. R. Weyer, of Norwich; Messrs. Verity supplied the gas-fittings, and Mr. A. R. Pank, of Yarmouth, the gas engine, beer engine, bells, and the gas-fitting generally; the laundry fittings are from Messrs. T. Bradford & Co., of London, and the stable fittings by the St. Pancras Iron Co. Mr. W. J. Bayes acted as clerk of the works.

#### A SEASIDE HOTEL IN CORNWALL.

This hotel is to be built at Bude, a rising seaside resort on the north coast of Cornwall. The site is on the cliff facing the Atlantic, and has magnificent views of the Cornish coast, as well as most extensive views inland.

Two main features had to be considered in making the plans. Firstly, the peculiarly exposed nature of the site. Secondly, it was laid down that there were to be no back buildings, yards, or stables of any kind, but that the building should present from every point of view, so to speak, a front elevation.

The plan of the building is that of a long front, 143 ft., facing the sea, with wings standing on each side, each 148 ft. long. The ground floor consists of the usual reception rooms, including lounge, drawing and dining rooms, coffee room, with servery, still room and bar conveniently adjoining, billiard and smoking rooms, &c. These occupy the whole of the front and north wing, the south wing being utilised as a bedroom wing. The kitchen, sculleries, &c., are in the basement; the first and second floors are devoted to bedrooms; sitting rooms with bath and bedrooms *en suite* being also provided.

The hotel is to be a first-class hotel, with all modern fittings and furniture, and is to accommodate about 120 visitors. The estimated cost of the building, exclusive of furniture, is 25,000l.

The external facing up to the second floor is to be of local stone taken from the land of the proprietor, and which is of a soft brown colour; the top story is to be of a lighter-coloured stone. The external walls are to have a hollow lining.

The architects are Messrs. Rogers, Bone, & Coles, and the drawing was exhibited at the Royal Academy last year.

We have introduced this and the preceding illustration in the same issue, as both being instances of hotel designs in which the usual tawdry and showy character is avoided, and the building treated in a simple and unpretentious manner. We should like to see more hotels built with a similar kind of architectural treatment. The majority of hotel designs are of a type that an architectural journal hardly cares to admit into its pages.

#### DESIGN FOR A TIMBER CHURCH.

This design was sent in for the R.I.B.A. Grissell Medal Competition this year, and was awarded a medal of merit.

The walls are constructed with oak studs 9 in. by 9 in., average size, pinned together with torn oak pins with pieces 4 in. by 4 in. lathed on both sides to take the rough cast outside and the plaster inside; the space between the laths being filled in with silicate of cotton. The 9 in. by 9 in. studs are exposed internally as well as externally.

The other materials suggested are local rubble for the stone plinth and chimney from heating chamber; oak shingles for roof, lead for all ridges, valleys, gutter, and rainwater pipes, and lead lights filled in with green tinted glass for the windows.

The roof over the nave is of hammer-beam construction, thus not necessitating the use of pillars inside the church, and ensuring therefore an uninterrupted view of the pulpit from every seat. The elevations were kept as simple as possible and care was taken to make them express the plan.

W. STANLEY BATES.

#### HITCHIN TOWN HALL.

This design was submitted in the recent limited competition for the proposed Public Buildings at Hitchin, and was placed first by the assessor, Mr. E. W. Mountford.

The size of the hall was fixed by the conditions drawn up by the Council, and as it was desired to seat 750 on the ground floor, the plan was carefully thought out with a view to economising the space occupied by gangways, and to afford easy and simple means of exit.

As the principal entrance was at the opposite end of the hall from the stage, a communication corridor was arranged leading to the cloak-rooms, front seats, retiring rooms, and stage, &c., without the necessity of going through the hall. For reasons of economy, the retiring rooms were placed one over the other. The various uses to which a hall of this sort would have to be put were carefully considered in making the design.

The "conditions" required the offices to be placed in front, as shown, but by showing the roof of the large hall over the roof of the office block, it was hoped to denote a large building behind the smaller one.

The materials proposed to be used were red brick with stone dressings. The upper part of front and round the windows of hall to be rough cast. Red tiled roof and fleche covered with copper.

The roof of the hall was to be carried by steel principals, and the hall itself was ceiled by a circular barrel vault in plaster, with enriched ribs from pier to pier.

The Council wished to spend 2,500l., and for this reason the design and materials were kept simple.

GEOFFREY LUCAS.

- MEMORIAL TABLET, ELGIN.—Councillor Boddie, Aberdeen, has just completed a wall tablet in Corennie granite to the memory of Messrs. Reid, architects, Elgin, which is to be erected by the Builders' Association as a mark of esteem.

ST. JAMES-THE-GREAT, BETNAL GREEN ROAD.—An appeal is made for contributions towards a sum of 4,000l., the estimated cost of the repair and restoration of the church locally known as the "Red Church," which is in a dilapidated condition. It needs a fresh roof, whilst the stone and lead work should be renewed. The church, erected, after Blore's designs, by a brother and sister, friends of Bishop Blomfield, was consecrated in June, 1844. The organ, by Walker, was repaired and removed to the east end in 1876.



## The Student's Column.

### SOUND, LIGHT, AND HEAT.—III.

#### SOUND: PROPAGATION.

**T**HE propagation of sound in air is one of the most important sections of the science for us, but it must not be forgotten that solids are also excellent conductors, and sound may reach the ear through solids alone without having to traverse the air at all. We stated in the last article that sound is not propagated *in vacuo*, and detailed an experiment demonstrating this. As a consideration of that experiment and others of a similar nature, the following law has been laid down: "The intensity of sound depends on the density of the air in the place in which it is produced." The actual density of the air at any given spot largely depends on the atmospheric pressure at that place. If the earth were at rest, and the whole of its surface at a uniform temperature, the atmosphere would form an envelope consisting of layers or shells, concentric with the globe; the pressure being the same throughout any one layer, but varying from layer to layer according to a law depending on the distance of the layer from the earth's surface or on its altitude. There would be no tendency to any disturbance of the equilibrium; there would be no motion of the air—no wind. If now any portion of the earth's surface be heated, the air resting upon it will be expanded, and the equilibrium will be disturbed. The action of this heating will be to cause the layers, or surfaces of equal pressure, to expand like the outside of an inflated bladder, and therefore to rise from the earth. The lowest will be most raised, and the pressure at the upper levels will increase.\* Air pressure is, of course, measured by the barometer, and as leading directly to the question of density, we may state the following laws laid down by Mohr.† He observes that the barometer stands high when—

a. The air is very cold, for then the lower strata are denser and more contracted than when it is warm. The contraction causes the upper layers to sink, bringing a greater number of air particles, so that the pressure at the base of a column of air at such a place is greater than would otherwise be the case.

b. The air is dry, for then it is denser than when it is moist.

c. In any way an upper current sets in towards a given area, for this compresses the strata underneath.

It is also laid down that the barometer stands low when—

a. The lower strata are heated, causing the surfaces of equal pressure to rise, and the upper layers to slide off, for by this means the mass of air pressing on each unit of area below is reduced.

b. The air is damp, for as the density of aqueous vapour, at the temperature of 60° Fahr. and pressure of 30 in. is 0.622, air being=1, the mixture is lighter the more vapour it contains, and consequently, damp air does not press so heavily as dry on the unit of area below.

c. The air from any cause has an upward movement, for this, of course, acts in the same manner as a.

These laws or rules may be considerably extended and modified, as when snow is on the ground, and when we are considering districts in the interior of large continents. They are sufficient, however, to show how the precise situation of a place, as on a plain, near the sea, on a hilly or mountainous ground, may affect the propagation of sound. On high mountains, where the air is much rarer, a greater effort is required in speaking in order to be heard distinctly, and the discharge of a gun produces a sound comparatively feeble as compared with that heard at lower altitudes with the same weapon and explosive. In regard to the former, the physiological part of the question must also be taken into account, as it is certainly not so easy to speak or shout at high altitudes.

The chemical composition of the air, also, has its meaning in this connexion. The atmosphere is considered to be normally a mechanical mixture of nearly four volumes of nitrogen and one of oxygen, with minute pro-

portions of carbon dioxide and water vapour, and still smaller quantities of ammonia and ozone. A portion here included under nitrogen is composed of argon and the more recently discovered krypton. The quantities mentioned are liable to some variation according to locality. The mean proportion of carbon dioxide is about four parts in every 10,000 of air; in the air of streets and houses the proportion of oxygen diminishes, whilst that of carbon dioxide increases. Dr. Angus Smith gives\* the following variations in the percentage amount of oxygen in specimens of air: very pure air on an open heath in Scotland, 20.99; large open spaces in London in summer time, 20.98; in the old Court of Queen's Bench, 20.65; and the worst specimen of air he had ever examined, obtained from a mine, 18.27. He found impure air in Manchester to have only 20.21 of oxygen, whilst the proportion of carbon dioxide in that city during fog was ascertained to rise sometimes to 0.067, and in the pit of a theatre to the very large amount of 0.273. The average proportion of carbonic acid in several specimens of London air yielded 0.043 per cent, whilst the air in the tunnels of the Metropolitan Railway gave 0.145. Incidentally, it may be remarked that when people speak of good ventilation in dwelling-houses, they mean, without knowing it perhaps, air with less than 0.7 of carbonic acid.

Pressure and density, however, are not the only things to be considered. The air is laden with solid particles, aqueous vapour and the like, which taken together have considerable influence in the propagation of sound.

In dealing with questions relating to the density of gases it is customary to regard air as unity, and the density being taken at zero under the pressure of 760 mm., the following results have been arrived at:—

#### Density of Gases.

Air .....	1.000	Sulphuretted hydrogen .....	1.101
Hydrogen .....	0.069	Carbonic acid .....	1.520
Marsh gas .....	0.559	Hydrochloric acid .....	1.254
Carbonic oxide .....	0.657	Sulphurous acid .....	2.247
Nitrogen .....	0.971	Chlorine .....	3.440
Oxygen .....	1.105		

Now, we see that hydrogen is about  $\frac{1}{7}$  the density of air under the same pressure. At the same time, it may be remarked, sounds are much feebler in it; on the other hand, in carbonic acid, the density of which is 1.520, sounds are much more intense. The student will see the object of our going into the quantity of that gas in air under divers conditions, and in this connexion we may refer also to the statement made in the last article of this series that "with a hall crowded with people and bad ventilation, the state of the air may be such as to distinctly modify the quality or intensity of sound propagated within it." The comparatively small but by no means unimportant proportions of the minor constituents of the atmosphere are much more liable than the more essential gases to variations. Chloride of sodium (observe the density of chlorine), for instance, is, as might be expected, particularly abundant in the air bordering the sea. Nitric acid, ammonia, and sulphuric acid appear more conspicuously in the air of towns.

As will be readily understood, the intensity of sound is modified by the motion of the atmosphere and the direction of the wind. Sound is always propagated better in calm air than in a breeze or wind.

The distance of the ear of the observer from the sonorous body is, of course, a prime cause also of modification in intensity of sound, so far as any particular observer is concerned. The rule is that "The intensity of sound is inversely as the square of the distance of the sonorous body from the ear." In reference to this law Atkinson remarks that, although it has been deduced by calculation, it may also be demonstrated experimentally. Let us suppose several sounds of equal intensity—for instance, bells of the same kind, struck by hammers of the same weight, falling from equal heights. If four of these bells are placed at a distance of twenty yards from the ear, and one at a distance of ten yards, it is found that the single bell produces a sound of the same intensity as the four bells struck simultaneously. Consequently, for double the distance, the intensity of the sound is only one-fourth. The distance at which sounds can be heard depends on their intensity—some noises have been heard three hundred miles away from the spot where they were produced.

The next proposition is self-evident—namely, that "The intensity of the sound increases with the amplitude of the vibrations of the sonorous body." Let us take some well-strung vibrating cord; the oscillations of the longer ones may be clearly seen by the naked eye, and it will be noticed that the sound is feeble in proportion as the amplitude of the oscillations decreases.

One of the most important factors in the science of the propagation of sounds, so far as the architect is concerned, is bound up in the following rule, namely, that "sound is strengthened by the neighbourhood of a sonorous body." We must go into this in much detail on a future occasion in this series; at present all we need do is to cite the familiar experiment in which a string is made to vibrate in free air, and the sound is measured and found to be very feeble, but placing this same string above a sounding-box, as in the case of the violin and other musical instruments, the sound is found to be very much strengthened. This arises from the circumstance that the box and the air which it contains vibrate in unison with the string.

Attempts have been made\* to get a measure of the loudness of sound which would serve as a standard, by allowing leaden pellets to fall from various heights on an iron plate of some size. The conclusion is that, within certain limits, the loudness is nearly proportional to the square root of the height from which the pellet falls, and not to the height itself. It thus appears that only a portion of the energy of the falling body is expended in producing vibrations of the plate.

In this connexion—respecting sound being strengthened in the neighbourhood of a sonorous body—it is only necessary to call the student's attention to various attempts made in theatres and public halls to increase sound artificially.

## GENERAL BUILDING NEWS.

**EXTENSION OF THE GUILDHALL SCHOOL OF MUSIC.**—On Monday the Lord Mayor opened an extension of the Guildhall School of Music in John Carpenter-street, E.C., adjoining the old building. The site measures 72 ft. by 51 ft., and the new building provides a theatre 47 ft. wide, 55 ft. long, and 30 ft. high, fitted at the northern end with a stage (which has an asbestos fireproof curtain). There is a large gallery at the opposite end of the auditorium. Entrances from the theatre are provided from the old school and, in addition, there are six emergency exit doors, four to John Carpenter-street and two to the City of London School for Girls in the rear. In the basement are dressing-rooms, green-room, &c., all in direct communication with the stage and the older building. Above the theatre are three floors, divided into thirty classrooms by double partitions; each partition is formed of hollow blocks, which arrangement is intended to prevent the passage of sound from the various rooms; for a similar reason the floors are framed independently of walls, partitions, and ceilings. The constructional portions of the floors are of iron and concrete. The warming is effected by hot-water radiators, which are also utilised for the introduction of fresh air; the vitiated air is withdrawn by means of extractor trunks connected with the upcast shaft from the furnace. Electric lighting is provided, and a lift communicates with the various floors. Arrangements will be made for providing rooms for the use of the lady students, where they will be able to obtain, during school hours, luncheon or other light refreshment. New general offices will also be constructed. The foundation stone of the new building was laid in 1897 by Mr. Deputy Pearce Morrison, the Chairman of the Music Committee for that year. The cost of the new building is estimated at 20,500*l.* The architect was Mr. A. Murray, the City Surveyor, assisted by Mr. R. W. Mossman. The builders were Messrs. Perry & Co.; the stone carving was by Mr. Gilbert Seale; the hot-water engineers were Messrs. J. Wontner-Smith, Gray, & Co.; the electric lighting by Messrs. Berghiel & Young, under the supervision of Mr. Hawtayne; the plaster and ornamental decorations by Mr. J. M. Bocklander; the stage fittings, asbestos curtain, &c., by Messrs. E. & E. Taylor & Co.; the hydraulic lift by Messrs. Moffat & Eastmair; and the copper roofing by Messrs. Braby & Co. Mr. Snook was the clerk of works, and Mr. Wheatley the general foreman.

**CHURCH, MORECAMBE.**—The foundation-stone of St. Barnabas's Church, Morecambe, will be laid next week. Plans have been prepared by Messrs. Austin & Paley, Lancaster, for a church to be built at a cost of 6,500*l.* without the tower. At present it is proposed to proceed with the erection of the chancel, side chapel, and three ways of the nave, providing accommodation for about 400 persons.

**CHURCH OF ST. PETER, HORSNEY.**—The Lord Bishop of London consecrated on the 8th inst. the

\* Consult "Elementary Meteorology," by Scott, 1883, pp. 238, et seq.

† "Grundzüge der Meteorologie," 2nd ed., 1879, p. 206.

‡ See Scott, *op. cit.*, section "Distribution of Atmospheric Pressure."

\* "Air and Rain," 1872, pp. 55, 56.

\* Cf. Atkinson "Ganot's Physics," Fourteenth edition, 1893, p. 208.



new Church of St. Peter, which is situated at the corner of Lausanne-road, in Wighlman-road, Hornsey. The church is built of red brick, with dressings of Monk's Park stone from the quarries of Bath Stone Firms, Limited, Bath. The building is not yet complete, as the chancel has to be added. A baptistry is located at one end of the church, with a turret on each side. The church will accommodate 700 persons, and the cost of the site and building, including the site for the vicarage, is about 9,000l. Mr. W. Farmer, of Lausanne-road, is the builder, and Messrs. Jas. Brooks & Son, of London, are the architects. An illustration of the building appeared in our issue of August 15, 1896.

**PARISH CHURCH, GREYSTONES, NEAR DUBLIN.**—An addition to Greystones Parish Church has just been dedicated. The plans for the extension were designed by Mr. J. F. Fuller (architect), and the contractor was Mr. R. Mellon, of Rathgar. The extension of the building includes additional seating accommodation for about 200 people on the ground floor, and a gallery capable of seating a further 300 worshippers. A chamber has been built under the vestry for the purpose of heating the church.

**TOWER AND SPIRE OF SALISBURY CATHEDRAL.**—A thanksgiving service was held in Salisbury Cathedral on the 11th inst. to celebrate the completion of the restoration of the tower and spire of the cathedral, at a cost of 14,000l. The work has been carried out under the superintendence of Sir Arthur Blomfield. For a description of the work of repair, see our issue for February 26, page 198.

**WESLEYAN CHURCH, TWICKENHAM.**—The memorial stones of a new Wesleyan church have just been laid in Queen's-road, Twickenham. The building, which will seat 600 people—350 on the ground floor and fifty in an end gallery—will be built of red brick with Bath stone dressings, in the Early English style. Later it is intended to build a spire at the north-east corner, rising to a height of 80 ft., and the vacant land will be laid out as an ornamental garden and approach. The existing chapel, which was built in 1880, will be used as a school-room and class-rooms, and a church parlour will also be constructed. The total cost of the work is estimated at about 4,400l. The new building and the alterations to the existing chapel were designed by Mr. Charles Bell, and are being carried out by Messrs. S. W. Aries & Co., of Putney, under his direction. The foreman of the works is Mr. Hart-ridge.

**CONGREGATIONAL CHURCH, CARDIFF.**—The foundation and memorial stones of a new Congregational church have just been laid in Cowbridge-road, Cardiff. The building will be in the Perpendicular style. The architects are Messrs. Veall & Sant, and the contractor Mr. W. T. Morgan. The building is now being proceeded with will give accommodation to 600 worshippers.

**WESLEYAN CHAPEL, HIGH BROOMS, TUNBRIDGE WELLS.**—The foundation stones have just been laid of a new Wesleyan Chapel, High Brooms. The builder is Mr. John Jarvis, and the architect is Mr. Herbert M. Caley.

**BAPTIST CHURCH, REDDITCH.**—On the 6th inst. a new Baptist church was opened at Redditch. The building has been constructed of red brick, with white stone dressings. It is 60 ft. long, 36 ft. 6 in. wide inside, and 40 ft. wide across the transepts; and seating accommodation is provided for 630 persons, with room for adding 130 sittings. There is a tower about 60 ft. high. The plans for the church and schools—the latter, being detached and prepared by Mr. John Wills, of London and Derby—and the work was done by Messrs. C. G. Huns & Sons, of Redditch.

**WELSH CHAPEL, BIRMINGHAM.**—A new chapel for members of the Welsh Calvinistic Methodist Connexion is being erected in Suffolk-street. The new building is set back from the road, and when finished will be 30 ft. wide by 47 ft. long, giving accommodation for about 200 people. In addition, there is to be a meeting-room, and a house in the rear. Its cost will amount to about 4,000l. Messrs. Iggall & Son are the architects.

**FREE CHURCH, MONMOUTH, FIFESHIRE.**—During the past fifteen months the Free Church at Bow of Fife has been undergoing reconstruction. The new building has been erected from plans prepared by Mr. James Gillespie, St. Andrews.

**VICTORIA WESLEYAN CHURCH, BLOWICK, LANCASHIRE.**—The new Victoria Wesleyan Church, Blowick, was opened on the 6th inst. The new church faces Sussex-road. It is built of brick, faced with Accrington red-pressed brick, with Burnley stone dressings. The total cost of the church will be about 4,500l. The architects were Messrs. Green & Brown, of Liverpool, and the contractors Messrs. Duxfield Bros., Southampton. The contractors being as follows:—Brickwork, Mr. Marshall; stonework, Messrs. Rimmer Bros.; plastering, Mr. W. Wright; plumbing, Mr. R. A. Ault; painting, Mr. A. E. Scarlett; and heating apparatus, Messrs. Dargue & Griffiths.

**CONGREGATIONAL CHAPEL, PRESTON.**—On the 7th inst. a Congregational school-chapel was opened in Garstang-road, Preston. The cost of the building will be 4,500l. The architect was Mr. Andrews.

**SCHOOL BOARD OFFICES, LIVERPOOL.**—On the 30th ult. Sir George Kekewich, K.C.B., D.C.L., permanent secretary of the Education Department, opened the new offices in Sir Thomas-street, Liverpool, which have been erected for the accommoda-

tion of the officials engaged in the administrative work of the Board. The new building is erected on a site adjacent to the Conservative Club and opposite to the Municipal offices. There is a frontage to Sir Thomas-street of 61 ft., and to Cumberland-street of 55 ft. The sides are enclosed by the adjoining buildings. The plan consists of a central area and staircase, with the offices, &c., ranged around on each floor. The ground floor is principally devoted to the outdoor departments, which will be approached by the Cumberland-street entrance. These consist of a central waiting-room, opening into the male and female visitors' rooms, pay office for the truant schools, room for interviews with parents, and storekeepers' office. The lift is situated in the centre of the main staircase, immediately opposite the principal entrance. Reaching the first floor the entrances to the principal offices are found right and left of the landing. The various departments, together with their private offices, extend round the staircase and area. At the second floor the lift opens opposite to the ante-room to the board-room. The board-room measures 40 ft. by 20 ft., and is divided into four-bays by teak pilasters and principals, the coved ceiling being finished with ornamental plaster work. This ceiling is carried up to form a dome light over the bay devoted to the chairman's dais. The two committee rooms, conference room, and retiring rooms for the members of the Board complete the accommodation of this floor. The next floor contains two other conference rooms, and also a lady member's room, with retiring rooms adjoining. The top floor has a range of offices along the Cumberland-street front, and a library, 20 ft. by 35 ft., at the back. This latter has an open timber roof, and is divided by bookcases into study compartments. A basement extending through the whole site is provided for storage purposes. The windows throughout are fitted with the patents of the National Accident Prevention Company. The principal contractors were Messrs. Thornton & Sons, and Mr. Thomas Hallam acted as clerk of works. The contractors for the fittings were Messrs. Brown & Backhouse, and for the furniture Messrs. Chapman & Sons. The electric lighting is by the Howe Electrical Company, and the electric fittings and wrought metal work by Mr. G. Wragge. The hydraulic lift was provided by Messrs. Musker & Co., of Bootle; the heating and ventilating by Messrs. J. R. Cooper & Sons; the tiling and mosaic by Mr. George Swift; the ornamental glass by Mr. Rowlands; the Hopton Wood stonework of the staircase was quarried and worked by Messrs. Killer Bros., of Wicksworth; and the whole was carried out from the designs and under the superintendence of Mr. Charles E. Deacon, architect.

**PROPOSED NEW SCHOOLROOM, MOULSHAM, ESSEX.**—The tender of Messrs. Choat & Sons has been accepted for building a new schoolroom at Moulsham for girls and boys. The architect is Mr. Charles Pertwee.

**BOARD SCHOOL, KETLEY, SALOP.**—A new Board school has been erected at Ketley for the Wellington School Board. Messrs. R. & J. Millington were the builders, and Mr. Dalgleish was the architect.

**SCHOOL, PENARTH.**—The new Board school which has been erected at Penarth was opened recently by Lord Windsor. The school is large, built to provide accommodation for 780 children, and it consists of two floors. The ground floor will be occupied by infants and the upper floor by boys and girls. There are six class-rooms, and, in addition, a cookery-room with scullery, and also a room for the use of the Board. The upper floor is somewhat different. Here an assembly hall is arranged, measuring 53 ft. by 28 ft. The school is heated by hot water on the low-pressure system. This portion of the work has been carried out by Messrs. John Williams & Sons, Cardiff. Two large playfields are arranged in the playgrounds. The architect of the building is Mr. J. H. Phillips, Cardiff, and the builder is Mr. John Jones, of Penarth. The amount of contract was 7,375l.

**SCHOOL BOARD OFFICES, ABERDEEN.**—The new offices for the School Board of Aberdeen in Union-terrace are now practically completed. There are five floors in the building. That on the basement is occupied as stores. On the ground floor, which is reached by a wide staircase, are the cashier's room on the right, a committee room on the left, and in front the general clerks' room. Adjoining the cashier's room is a cloak-room. On the first floor, a strong-room and a cloak-room. On the second floor, to the right and left of the entrance, and looking out on Union-terrace, are the clerk and treasurer's office, and the chairman's private room, with adjoining apartments for assistant clerks. On the same floor, and opening out to the broad landing, is the principal chamber, the board-room, the walls of which rise to a height of 18 ft., and these, for a distance of 4 ft. from the floor, are paneled with oak. The room is horseshoe in shape, and at the entrance is a paneled oak porch, which, in addition to giving access or egress by a doorway at each side, forms the back of the chairman's platform. The chairman's seat shows on the back the city coat of arms in relief. The second floor of the building is devoted to the Work Department. The third floor contains the housekeeper's apartments. Throughout, the offices are lighted by electricity. The furnishings have all been made from designs prepared by Mr. J. A. Ogg Allan, the Board's

Architect and master of works, and their construction has been superintended by Mr. David Lindsay, Liverpool. The architect was Mr. A. Marshall Mackenzie; and the contractors were: Mason, Geo. Fordyce & Co.; carpenter, D. Macandrew & Co.; slater, A. Adam & Co.; plaster, James Bannochie & Sons; plumber, A. B. Robertson; painter, G. Donald & Sons; furniture, D. Macandrew & Co. and J. Ellicock; electric lighting, P. C. Middleton & Co.

**TECHNICAL SCHOOLS, HARROGATE.**—New Technical Schools are about to be erected at the junction of Bower-road and Haywra-crescent, Harrogate, from plans, selected in competition, prepared by Mr. W. J. Morley, of Bradford and Harrogate.

**NEW WING, JEWS' FREE SCHOOL, SPITALFIELDS.**—A block of buildings, forming an additional wing of the Jews' Free School, in Spitalfields, was opened on the 5th inst. The structure, which represents an expenditure of close upon £20,000, is intended as a memorial on the part of the Jewish community of the benevolence of Lord Rothschild, the President of the institution. Mr. N. S. Joseph was the architect.

**ADDITIONS TO BOSTON HOSPITAL, LINCOLN-SHIRE.**—The foundation stone of the wing which is being added to Boston Hospital, in commemoration of her Majesty's Diamond Jubilee, has just been laid. The additions include a new operating-room, and a separate surgery and an out-patients' room. Better sculleries, pantries, and offices will also be secured, as well as five additional bedrooms for the accommodation of the nursing staff. Mr. J. Rowell is the architect, and Mr. H. W. Parker the builder.

**CHILDREN'S WARD, ROTHERHAM HOSPITAL.**—On the 7th inst., a children's ward—to be known as the Queen's Ward—was opened at the Rotherham Hospital. At the present time the children are treated in the female ward, but the new wing will have provision for fourteen beds, and for two beds in the isolation ward. Mr. J. D. Webster, of Sheffield, is the architect, and Messrs. Chadwick & Co., of Rotherham, are the contractors. The bath-rooms and sanitary blocks have been fitted up by Messrs. Dent & Hellyer, of London. In addition to the Hope ward there is a small isolation ward for two beds, fitted with bath-rooms. The cubic space allowed to each bed is about 1,200 ft. The walls of the wards are lined with Burnmantoft faience up to the height of 5 ft., and above that the walls are painted Parian cement. The large ward is heated by a central stove in addition to hot water pipes. The building has been erected under the superintendence of Mr. J. D. Webster, jun.

**EXTENSIONS TO THE GENERAL HOSPITAL, NOTTINGHAM.**—The foundation stone has just been laid of an extension to this hospital. Mr. Alfred Waterhouse is the architect.

**WORKHOUSE INFIRMARY, WHISTON, LANCASHIRE.**—The new infirmary buildings which have been erected by the Prescot Board of Guardians on land adjoining the workhouse at Whiston were opened on the 7th inst. The new buildings have been erected from plans prepared by Mr. James Gandy, architect, St. Helens, at a cost of about 20,000l. The contract for the work was secured by Mr. Fred Brown, of St. Helens. Accommodation is provided for about 300 beds, arranged in thirties on each of the ten floors. The buildings are of brick, and comprise two large blocks of three stories, and two blocks of two stories each.

**MASONIC HALL, CARRICKFERGUS, NEAR BELFAST.**—The new Masonic Hall in Carrickfergus has just been dedicated. The new hall is two stories high, 30 ft. by 48 ft. in dimensions. Mr. S. P. Close was the architect, and Mr. Ezekiel Caters the builder.

**MISSION HALL, CARRINGTON, NOTTINGHAM.**—The stone laying ceremony has just taken place in connexion with a new Mission Hall, Carrington. The site is at the corner of Hucknall-road and Alexandra-street. The architect is Mr. H. Sulley, and the contract has been let to Mr. William Maule. The hall will consist mainly of three rooms—a hall, 31 ft. by 48 ft. 6 in., to seat 300; a minor hall, 31 ft. by 17 ft., with accommodation for eighty; and infants' class-room (seventy), 31 ft. by 18 ft. It will be possible to throw the three rooms into one, folding doors dividing them. In addition to these principal portions of the building there are to be eight class-rooms—six 10 ft. square and the other two 14 ft. by 12 ft.—which will each accommodate twenty persons. The chief entrance is to be at the corner, at the junction of the two thoroughfares, and there will be two others, one in either street. The cost of the building itself will be 1,600l.

**DEPTFORD FUND HOUSE.**—The Prince of Wales laid the foundation-stone recently of the new Deptford Fund buildings in Creek-road. Mr. Charles Mileyham is the architect of the new buildings. The general idea of the new buildings is that of two large blocks; one facing the old road, consisting of a building of two stories above the ground floor, containing accommodation devoted to the charitable and philanthropic portion of the work, including club-rooms for girls, and bath-rooms; and a higher building for educational work and class-rooms, with club-rooms for men and boys, and dormitories for girls, facing the new road. These two blocks, which form two sides of a triangle, will eventually be joined by a hall, &c., which forms the second part of the scheme. In the basement there will be a sick-kitchen, 28 ft. by 16 ft., with larder, store-room, scullery, &c.; and on the new road side a



club-room for men, measuring 33 ft. by 22 ft., boiler-rooms, coal stores, and offices. On the ground floor will be the entrance-hall from the new road, on the Creek-road side, the sick-kitchen entrance, waiting-room and serving-room, with a lift communicating with the kitchen. The first floor on the Creek-road side will be occupied by a club-room for girls, 40 ft. by 22 ft.; while on the new road side will be the cooking class-room, 21 ft. by 25 ft., exclusive of the scullery, store-room, and larder. The second floor is taken up on the Creek-road side by bath-rooms for men and for women, the sewing class-room, and a men's recreation-room. The roof of the Creek-road block will be used as a recreation ground. On the third floor are a laundry class-room and a reading-room for men, and the fourth floor of the block of buildings on the side of the new road will consist of a range of dormitories for girls.

**STOCKPORT INFIRMARY.**—The contract for the enlarging of the Stockport Infirmary by the addition of two new wards, nurses' quarters, new laundry, &c., has been let to Messrs. Meadows, of Heaton Norris, for the sum of 10,087. Messrs. Woodhouse & Willoughby, Manchester, being the architects.

**NURSES' HOME, ASHTON-ON-MERSEY.**—The Nurses' Home, Ashton-on-Mersey, near Manchester, which has been erected from the designs of Messrs. Whitelegg & Whittaker, of Manchester, at a cost of about 1,000, was formally opened on Saturday last by Mrs. Coningsby Duxell. This building contains two wards (each for two patients) on the first floor, and an accident ward on the ground floor, with accommodation for the nurses. It is built in the half timber style, with tiled roof, and immediately adjoins St. Mary's Schools, which were designed by the same architects. Mr. John E. Dean, of Ashton-on-Mersey, was the builder.

**POLICE STATION, LICHFIELD.**—The new police-station for Lichfield, which has been erected by the Standing Joint Committee of the Staffordshire County Council, is now complete. The principal entrance is in Vaucluse-street. The buildings are faced with sanded Leicester bricks with Hollington stone dressings, and are set back from the street with iron railings in front. The cost has been about 5,500, and the building has been erected from the designs and under the superintendence of Mr. John P. Osborne, of Birmingham, the contractor being Mr. John Gethin, of Shrewsbury, and the clerk of works Mr. W. Sier.

**Y.M.C.A. BUILDINGS, NORTHAMPTON.**—The new hall and buildings of the Northampton branch of the Young Men's Christian Association were opened recently. The new premises were, until last year, the church and school of the Northampton Unitarians. Mr. H. H. Dyer, architect, has adapted the premises to the required purpose. The structural alterations have been carried out by Mr. J. M. Panting.

**COUNCIL CHAMBER, BRISTOL.**—The site at the back of the Council house, Bristol, is being cleared for the erection of the temporary Council Chamber, the cost of which is to be limited by resolution of the Council to 2,500. The building is to be erected under the supervision of the City Engineer (Mr. T. H. Yabbicom).

#### SANITARY AND ENGINEERING NEWS.

**BRIDGE, BONHILL, DUMFRIES.**—A new bridge has been opened at Bonhill in place of the old suspension bridge on the same site. The new bridge has one span of 160 ft., with a width of 35 ft., divided into a roadway of 21 ft., with a footway on either side of 7 ft. The bridge, which has cost about 7,000, was designed by Messrs. Crouch & Hogg, &c., Glasgow. The contractors were Messrs. John Paton & Co., of Glasgow, who placed the steel superstructure in the hands of Messrs. Somervail & Co., bridge builders, Dalnair.

**THE WATERLOO AND CITY RAILWAY.**—On Monday the Duke of Cambridge formally opened the new electric railway which connects Waterloo Station and the City, the length of the line being about one mile and a half. The Waterloo terminus of the line is immediately beneath the main line platform of the South-Western Company, the difference between the two levels being exactly 41 ft. There are three sloping ways of approach between the two stations, and two independent entrances from the outside thoroughfares. These five inclined ways lead to a common booking-hall, and there are three avenues sloping towards each of the two platforms, which are 100 yards long and 14 ft. wide. The arrival platform and a set of rails occupy one arch; the departure platform and a second set of rails are laid under an adjoining arch, the two lines of rails being divided by a brick pier. The tunnels (one for up and one for down trains) pass under York-road at a depth of only 18 ft. from the surface, and then descending towards the river they cross Waterloo-road. Proceeding along the line of Stamford-street to Hatfield-street, they then pass under the river in a north-easterly direction, emerging under the Victoria Embankment in front of the Royal Hotel at Blackfriars, whence they pass under Queen Victoria-street, till a terminal station is reached opposite the Mansion House. The crowded street-crossings which are immediately in front of the Mansion House, the Bank of England, the Royal Exchange, Cheapside, and Queen Victoria-street, were honeycombed at no great distance from the level by pipes of every description, and the con-

struction of the Waterloo and City terminus was only part of a great scheme of improvement which had to be undertaken at this point. It was decided by the late Corporation of London to provide a subway connecting all the important points of the crossings, so that passengers might be able to go from the Bank or the Royal Exchange to the Mansion House, Queen Victoria-street, or Cheapside, as also between other points, without incurring the risk of using the open crossings. To this subway it was decided that passengers to and from the Waterloo and City Railway should have access, and a similar facility was also offered to those who will use the Central London Railway. Although the subway has not yet reached the stage when it can be thrown open to the public, travellers by the Waterloo and City line will have access thereto from two points at the City terminus—one in Walbrook immediately in front of the private entrance to the Mansion House, the other at the junction of Cheapside and Queen Victoria-street. The train consists of four coaches. The front and rear cars are used as motor carriages, and contain two motors. Seating accommodation is provided in each motor car for fifty-six passengers, and in the mid-trailer for sixty-three passengers, so that the total seating accommodation is for 204 persons. Each train is fitted with the Westinghouse continuous brakes. The maximum speed attempted will be twenty-five miles per hour, and the journey between Waterloo and the Mansion House will be accomplished in five minutes, a five-minute service being maintained each way throughout the day. The electric plant which supplies the motive power for driving the trains is situated in a power-station, which is in Laurence-lane, externally to the eastern side of the London and South-Western Railway terminus. It is divided into generating-house, boiler-house, and depot. There are six sets of Belliss's engines, coupled direct to Siemens' direct current dynamos, each of which develops a current of 450 amperes at 500 volts pressure. The current is carried to the motors by a rail laid between the two running rails, and the return current passes along the latter. The rolling stock has been supplied by the Jackson & Sharp Company, of Rochester, U.S.A. The new line has occupied about six years in construction, the contractors, Messrs. Mowlem & Co., having commenced operations in June, 1894, and has cost about 500,000. Mr. W. K. Galbraith and Mr. J. H. Greathead prepared the plans, and the local supervision of the work was entrusted to Mr. H. Dalrymple-Hay. Unfortunately Mr. Greathead died during the progress of the work, and Professor Kennedy took his place, and gave special attention to the necessary electrical arrangements. The electrical engineers were Messrs. Siemens Bros.

#### FOREIGN.

**FRANCE.**—The Paris Municipality has made the first beginning of the work for the Metropolitan Railway, which necessitates the displacing of some of the sewers in the Rue de Rivoli. Also the works for the prolongation of the line from Moulinsaux, which had been abandoned for a long time, have been recommenced, and the walls of the Invalides terminus are now up to ground level of the esplanade. The foundations are being formed for the piers to carry the iron roof, and intermediate stations are in progress along the line, at Pont d'Alma, Avenue la Bourdonnais, Pont de Sully, Grand boulevard. The members of the Académie des Beaux-Arts have presented their former Secretary, the Comte Delaborde, with a medal in his honour, engraved by M. Chaplain. M. Formigé has been appointed to the position on the Administrative Committee of Fine Arts, vacant by the death of M. Galignani. The jury of the Ecole des Beaux-Arts has awarded the medals for "History of Architecture" to MM. Siot, Dyer, Marchal, Marcel Magne, Galliard, and Corbett. Among things lost in the *Bourgoigne* was one of the finest of Dupré's landscapes, "Le Passage du Gué." A large technical professional school has been opened at Nogent, under the direction of an architect, M. Vovard. A monument in commemoration of the Crusades has been inaugurated in front of the cathedral at Clermont-Ferrand. M. Gourgouillon is the sculptor and M. Teillard the architect. A crematorium has been constructed at Reims on the same lines as that at Paris. A large hospital is to be built at Marseilles, to be called the Hôpital Salvador, in honour of a benefactor who has left the funds for its erection. The death is announced, at Mariotte-Bourron, near Fontainebleau, of M. Allongé, the landscape painter. He was born at Paris in 1833, and was a pupil of Leon Cogniet and of the Ecole des Beaux-Arts. Having failed in obtaining the Prix de Rome, he abandoned historical painting for landscape, and painted chiefly little-known scenes in Brittany. He was however best known by his charcoal sketches, and obtained at the 1869 Salon a great success with these, which was repeated every year; and he succeeded in fact, in making "fusain" quite a fashion. He worked also a good deal in water-colours. He received medals in 1883 and 1889. The death is announced at Madagascar, of M. Frantz Bauer, member of the Société Centrale des Architectes, who carried

out, among other works, the Hôtel de the "Société des Agriculteurs de France," in the Rue d'Athènes. —The death is also announced of M. Latruite, "architecte-verifyer," arbitrator in the Tribunal of the Seine, and consulting architect to the Crédit Foncier de France.

#### MISCELLANEOUS.

**PROFESSIONAL & BUSINESS ANNOUNCEMENTS.**—Mr. C. J. Anderson, architect, of Prudential Insurance Buildings, Dale-street, Liverpool, has taken into partnership Mr. R. P. Crawford, and the firm will in future be "Anderson & Crawford."

**ST. GEORGE-THE-MARTYR, SOUTHWARK.**—The Home Secretary has issued an order to the churchwardens, under Section 23 of the Burial Act, 1857, calling upon them to remove all human remains from the crypt, in consequence of an adverse official report upon the sanitary condition, in that respect, of the fabric.

**SCREEN, ST. JOHN THE BAPTIST CHURCH, MARGATE.**—On the 30th ult., a belfry screen was dedicated at the west end of this church. The new screen is executed in teak. It consists of a central archway, with an arrangement of tracery work on either side, forming three divisions. The work has been executed by Messrs. Harry Hems & Son, Exeter, from designs by Mr. R. Dalby Reeve, architect, of Margate, who also designed the new doorway in the choir vestry which has been recently erected. A new font cover has also been carried out by the same firm, from designs by Mr. Reeve.

**DISCOVERY.**—Much interest has been excited in Leicester by the discovery of two additional tessellated Roman pavements in one of the most ancient quarters of the borough. They were laid bare at a depth of about eight feet. One measures 13 ft. by 10 ft., and the other 12 ft. by 7 ft., and both are in a remarkably good state of preservation. Both are of really beautiful design, and in this respect resemble others which had been previously discovered. In the larger portion there is the representation of a peacock with spread tail. It is known that the old Roman forum stood here, and it is accordingly believed that the pavements belonged to the Governor's residence or to the Temple of Janus, which was situated in the same neighbourhood. The newly-discovered pavements will be preserved intact in the position in which they have been found.—*Daily News.*

**BIRKBECK BUILDING SOCIETY.**—The forty-seventh annual meeting of the Birkbeck Building Society was held last week at the offices, 29 and 30, Southampton-buildings, Chancery-lane. The report adopted states that during the financial year just closed the total receipts from all sources, taken with the disbursements, discloses the fact that the annual turnover has amounted to 37,488,791, being a daily average of upwards of 120,000, for every business day that the office has been opened throughout the year. The investments now exceed ten millions, and the total liabilities on subscriptions and deposits also exceed ten millions; the balance of assets in excess of liabilities amounts to 131,084. The amount received for subscriptions during the year has reached the sum of 266,511. After allowing for withdrawals, the amount standing to the credit of investing members at the close of the year is 888,861, and the balance of deposits to 9,457,704, amounting together to 10,346,565, an increase over the past year of 1,233,364. The number of members who have joined the Birkbeck during the past year is 2,024. The register of shareholders now contains the names of 13,601 members, and the number of shares in existence at the close of the year was 69,611, which is the highest number yet reached.

**THE ABERDEEN SCHOOL BOARD AND THE WESTFIELD CONTRACTORS.**—A meeting of the Litigation Committee of Aberdeen School Board was held on the 5th inst. to consider as to further steps to be taken in reference to the action by the Westfield contractors. Some time ago the Sheriff issued an interlocutor, in which the hope was expressed that a settlement might be made on this matter, and so avoid the necessity for a protracted proof. It was understood, too, that the contractors were not averse to an arrangement being come to by which a proof in the action would be unnecessary. The committee, who receive powers from the Board to effect a settlement, were unanimous in their desire to have the question brought to an amicable conclusion. They therefore decided to make what they regard as a genuine offer with the view of having the matter brought to a final issue. The tender they have resolved to make is as follows:—To Messrs. Pringle & Simpson, buters, for any loss or damage and to work done, 200l.; to Messrs. Watt & Clark, carpenters, 100l.; to Messrs. Steph & Gibb, plasterers, 150l.; to Mr. John Grant, blacksmith, 110l.; and to Mr. John Thom, plumber, 100l.—*Aberdeen Free Press.*

**ARCHÆOLOGICAL REMAINS IN BIRMINGHAM.**—In the Minories, Birmingham, operations have been proceeding for some four months past in the building of large fruiterers' stores. These premises stand on the site of the old Priory of St. Thomas, and some remains of considerable archaeological interest have already been found in the shape of a portion of the old foundations, consisting of Birmingham sandstone. The stones have been sent



to Calthorpe Park, where they have been utilised to form a grotto or rockery. Now, however, an even more valuable discovery has been made. This is an ancient pump at the top of a well, which would seem to indicate that thereabouts was the refectory of the monks. The well was hidden in what had seemed solid ground, and was originally constructed in the Birmingham rockstone. Close by are the arches and remains of more modern foundations. The well is some 60 ft. deep, and contains water at its lower depths. The pump itself is fashioned out of the hollowed trunk of an oak tree, from the side of which projects a small cast-iron pipe curving into a trough of the same metal. This trough has a pipe on the one side and an aperture where evidently another pipe, now broken off, was once attached, and it contains a curious old slide, now rusted and unworkable, which was used to divert the water to whichever direction the trough it was desired to run.—*Birmingham Mail*.

**BARRY BUILDERS AND INSURANCE.**—The Master Builders' Association of Barry, after having discussed the various provisions of the Workmen's Compensation Act, have decided to insure individually during the present year with some company, in order that during that time a Mutual Insurance Company might be started.

**PRIZES AT KING'S COLLEGE.**—The distribution of prizes at King's College last week preceded the Conversazione, of which we gave a short account. In architecture and building construction, silver medals and prizes were awarded to Mr. W. H. Wright and Mr. Gilbert H. Lovegrove (Mathematical Scholarship Prizeman); the Engineering Prizes going to Messrs. Minnie and Summers, the Tennant Prize for Geology to Mr. G. H. Lovegrove, and for Mineralogy to Messrs. E. A. Beidam and L. C. Benton. The Right Hon. James Lowther presided, and delivered the prizes.

**THE STEVENSON MEMORIAL.**—The Executive Committee entrusted with the Robert Louis Stevenson Memorial have now, it is stated, come to a definite decision regarding the form which the commemoration is to take. A fund of about £1,400, has up to the present, been raised, and it has been decided that a mural monument, with a medallion portrait in high relief and architectural framework, shall be placed in St. Giles's Cathedral, Edinburgh. The Board of the Cathedral are prepared to allot the Moray Aisle as a poets' corner. The executive have secured for the execution of the memorial the services of Mr. S. Gaudea, the American sculptor.

**A PIECE OF FURNITURE REPRODUCTION.**—Messrs. Hindley & Wilkinson, of Bond-street, have on view a careful and elaborate reproduction of a splendid piece of Louis Quinze furniture, a bureau originally made by Riesener for Louis XV., which in modern times passed into the hands of the Empress Eugénie, and was finally added to the collection of the Louvre, where it now is. The reproduction has been carried out with the most conscientious care, both in regard to artistic finish and construction, at a cost of about 3,000l. A curious point in the work is the introduction of an oval plaque in each end of the bureau, containing white figures in relief on a light blue background, in the manner of Wedgwood's ware. These are said to be Sevres; if so, Wedgwood must have got his inspiration from this class of Sevres ware. But are these, in the original bureau, part of the original design? They hardly seem in keeping with the style of the rest.

**WROUGHT STEEL SASH PULLEY.**—The Westminster Manufacturing Company send us a sample of their sash pulley, made entirely in wrought steel. The pulley wheel has a wide groove devoid of any sharp edges which could endanger the cutting of the cord. The front plate and pulley are brass-faced. It seems altogether a very good piece of work.

**THE SANITARY INSTITUTE.**—At an examination in practical sanitary science, held in Cardiff on July 8 and 9, two candidates presented themselves, to whom certificates were granted, viz.:—J. E. Jarvis, Plymouth, and W. J. Tanlyn, Minehead.

**WARMING AND VENTILATION OF ST. MARY'S CATHEDRAL, EDINBURGH.**—The Board of Management of St. Mary's Cathedral, Edinburgh, acting on a report obtained from Mr. Arthur Clyne, architect, Aberdeen, have resolved on the adoption of a scheme for the warming and ventilation of the Cathedral. The contractors entrusted with the carrying out of this work are Messrs. J. Constantine & Son, of Manchester.

**GLASGOW ARCHITECTURE.**—Messrs. J. Burnet & Son write, in reference to the article on "Glasgow Architecture" in our last issue, that the architect of the Clydesdale Bank was Mr. John Burnet, not Mr. Sellars, and that on the other hand Mr. Burnet was not the architect of Botanical Gardens Station, but Mr. Jas. Miller. We can only say that, as in other similar cases, all the information as to the names of the architects was given to us by architects residing in Glasgow, who should have known.

**MEMORIAL WINDOWS, BEACONSFIELD.**—On the 1st inst., at the Parish Church, Beaconsfield, the dedication took place of three stained glass windows erected on the south side of the edifice in memory of the late Lady Lawson. The windows were supplied by Messrs. Bucknall & Comper, of Westminster; and they were fixed by Mr. Eldridge, with the assistance of Messrs. Ball and P. Coleman, of Beaconsfield.

## CAPITAL AND LABOUR.

**SWANSEA MASONS' STRIKE.**—A meeting of the Swansea Master Builders' Association was held on the 5th inst., when it was reported that two of the firms affiliated with the Association had, on their own behalf, approached the men, and offered them the 8½d. per hour, but the masons would not consider the offer unless it was made on behalf of the whole of the firms belonging to the Association. A long discussion then followed as to what course should be adopted, seeing that the men had refused every proposal made by the employers. Some were in favour of abiding by the first resolution, passed at the commencement of the strike, not to give an increase at all, whilst others thought that it would be wise to offer 8½d. per hour, and allow the old code of rules to remain in force. A vote was taken, and by a majority it was resolved to offer an increase of ½d. per hour all the year round.—At a mass meeting of the masons, held on the 6th inst., it was decided to accept the offer of the employers of an increase of ½d. per hour all the year round, and the old code of rules to remain in force.

**THE BRICKLAYERS' STRIKE, TIVERTON.**—The Tiverton bricklayers' and masons' strike, which has lasted two months, terminated on the 4th inst. by mutual arrangement. The masters have decided to pay 6d. an hour as asked by the men, and the men will walk home from jobs within a mile in their own time. The masters have further agreed that no labourer shall be sent out as a mason. The men have given in on the question of apprentices. They wished to limit apprentices to one in each shop, but the number is to be entirely at the discretion of the masters.

**OPERATIVE MASONS, GLASGOW.**—A working agreement has been signed on behalf of the Master Masons' Association of Glasgow and neighbourhood, and the Glasgow and suburban lodges of the Operative Masons' Association of Scotland, regulating the rate of wages and conditions of labour for the next twelve months. The most important point in the agreement is the raising of the standard rate of wages from 9d. to 9½d. per hour.

**THE BUILDING TRADE IN PAISLEY.**—The threatened strike in the Paisley building trade has been avoided by the master builders of the town granting the demands put forward by the workmen. The men had asked for an increase of wages from 9d. to 9½d. per hour, and also a stipulation from the masters that they would not change the present agreement, which allows not more than six apprentices in their service. The arrangement now come to is to be effective for a year.

**THE BRISTOL BUILDING DISPUTE.**—In the Bristol building trade dispute the intervention of the Board of Trade, who sent down Mr. A. A. Hudson, Q.C., as arbitrator, has been successful. Mr. Hudson held his inquiry on Tuesday, and the two points in dispute—walking time and the date of operation of the new rules, with an increase of half-penny per hour wages—were satisfactorily settled. A compromise was agreed to, and the arbitrator decided that the new rules should operate from September 1 instead of from next year.

**LANCASHIRE MASONS' DISPUTE.**—The dispute in the Lancashire building trade has now reached an acute stage, and it is feared that it will result in a general lock-out. It is stated that the difficulty originated in a demand on the part of the operative stonemasons for an advance of wages equivalent to 1d. per hour and a reduction of the weekly hours of working. A number of the masons also objected to work in wet and dressed abroad and imported into this country. Negotiations were entered into between the employers and the operatives on these points. An adjustment was not arrived at, and lock-out notices were issued by the employers. These notices expired last Saturday, but, in accordance with a desire made on behalf of the operatives, the masters have postponed the threatened general lock-out for another week. The employers have made certain proposals, which are under the consideration of the operatives' representatives, the result of whose deliberations will, in the course of a few days, be communicated to the employers.

## LEGAL.

### DISPUTE BETWEEN BUILDERS AND AN ELECTRICAL COMPANY.

In the Chancery Division, on the 7th inst., Mr. Justice Kekewich had before him a motion in the matter of Kirk & Randall v. the Westminster Electrical Supply Corporation, Limited, for an injunction to restrain the defendants from taking possession of certain works now in course of erection, which the plaintiffs, a firm of builders and contractors, were under contract to construct for them.

Mr. Butcher, Q.C., appeared in support of the motion; and Mr. Warrington, Q.C., Mr. Roger Wallace, Q.C., and Mr. Platt for the defendant company.

Mr. Butcher in opening the case said that the plaintiffs, under a contract dated September 23, 1896, undertook the construction for the defendants of certain works for the supply of electric light. The construction had been going on for a considerable time, as the plaintiffs alleged in entire accordance

with the contract of June 8. Notice was given by the defendants, purporting to be under the terms of the contract, calling upon the plaintiffs to execute certain works and remedy certain alleged defects within a limited time. The plaintiffs wholly denied that there was any default or defects, but on June 22, a further notice was served upon them by defendants claiming and stating their intention to take immediate possession of the works; in short to turn out the plaintiffs, who had large plant on the premises, and to prevent them altogether from completing the contract. The plaintiffs denied that they were at fault, and they were bringing forward a very considerable amount of evidence to show that the delay in building the works was entirely due to the defendants themselves.

Mr. Warrington said the fact was that the contractors would not work according to the contract, and there had been delay so long that the defendant company wanted these works completed.

His Lordship pointed out that to make another contract to bring new plant on the premises would take time.

Mr. Butcher said there could be no object on the part of a large firm like the plaintiffs in delaying the construction, and in fact they wished to build as quickly as possible. As late as April last defendants gave them notice to complete the works by September 29, and they were quite willing and quite able to do so, but notwithstanding that, the defendants now desired to turn them out on the spot.

His Lordship: What are you prepared to do?

Mr. Butcher: We are prepared to go on with the works according to the specifications and drawings, and any further specifications and drawings that the contract provides for, with the utmost diligence, and to carry out to the best of our ability the contract, and to proceed with the works under the contract with due diligence. Our only desire is to go on with the contract, and complete the works, and I should be perfectly willing to give an undertaking to that effect.

Mr. Warrington: The fact is my friend takes one view of the contract and you take another. The architect is, by the contract, to be the sole judge. They have quarrelled with the architect, and that is the trouble.

After further consultation it was arranged that the motion should stand over on undertakings, with liberty to apply.

### THE ALLEGED OBSTRUCTION OF ANCIENT LIGHTS BY A THEATRE.

In the Chancery Division of the High Court of Justice, on the 7th inst., Mr. Justice North again had before him the case of Smith v. the Barnsley Theatre Company, in which the plaintiff sought an injunction restraining the defendants from erecting a new theatre on their old site so as to interfere with the plaintiff's ancient lights. There was no appearance for the defendants, and his lordship granted an injunction over the 15th inst.

### LIGHT AND AIR CASE.

VICE-CHANCELLOR HALL, Q.C., sitting at St. George's Hall, Liverpool, on the 12th inst., had before him the case of Middleton v. Jump, in which Robert Middleton, of Fitzmanner, Salop, claimed an injunction to restrain the defendant, James Jump, from permitting the wall already erected at the south-east corner of the plaintiff's building in Drury-lane, Liverpool, to remain, and from erecting any buildings or permitting any erections to remain on the site of the said wall, which might in any way injure or obstruct the ancient lights and windows of the plaintiff's premises in Drury-lane, and known as Middleton Chambers.

Mr. Rotch and Mr. Durand appeared on behalf of the plaintiff; Mr. Maberly and Mr. McConkey represented the defendant.

Mr. Rotch having opened the plaintiff's case, Mr. Hartley and Mr. Wainwright, architects and surveyors of Liverpool, were called, and said that, in their opinion, the obstruction to the plaintiff's ancient lights, caused by the defendant's new premises, was of such a character that it could not be compensated for by a monetary payment. The loss of light to the ground floor offices was so great that on a bright day artificial light was necessary, and owing to the fact that the walls surrounding the widows in question were all red brick, most of the light was absorbed that would otherwise be reflected. The witnesses further said that, in the event of the premises being vacant, there would be a great difficulty in obtaining a suitable tenant. Evidence was also given by Mr. Patterson, the agent of the premises. A number of tenants in the building were called, and gave evidence as to the great loss of light occasioned by the defendant's premises. Mr. Grayson, the architect of the defendant's building, was examined by Mr. McConkey, and explained in detail the buildings it was proposed to erect, and said that none of the windows of the plaintiff's premises would be materially injured, and that, for the most part, they would be benefited owing to the reduced height of the main building.

Mr. James Rhind, an architect and surveyor of twenty-five years' experience, said that the light entering the windows of the plaintiff's building was a better light under existing circumstances than formerly; and in his opinion the letting value of the pre-



Cox, Switch Pans, 14,594. C. P. Showell, Sliding Rods for  
for Fanlight Openers, 8,453. Lityanski and Others,  
for rendering Materials Fire-proof, and for Fire Extinction,  
14,565. J. S. Jones, 14,573. J. Jones, 14,570.  
Jones, Concrete Foundations in Deep Water, and Locat-  
ing and Bonding Concrete Boulders in other structures,  
14,565. Jones, Veneers, 14,573. Jones, 14,570.  
Kilgus, Construction or Hanging System for Electric Lighting,  
14,579. A. Turner, Tenement Buildings, 14,581. A. R.  
Blasse, Hot Air Heating Apparatus, 14,582. Reiden-  
bach, 14,583. H. Hofmann, and 1,625. H. C.  
Norman, Grinding, Crushing, and similar Machines,  
14,595. See also Grinding and Crushing Machines,  
14,595. Iron Work, 14,597. McCleughlin and Others,  
Opening and Closing Windows and Ventilators, 14,603.  
M. Wats, Plagues, Tablets, Panels, &c., 14,614. Laar-  
sen, 14,614. H. H. Jones, Pressure Apparatus for Clearing  
Residual Deposits from Gas Service Pipes, 14,635. M.  
Heinrichs, Brick Kilns, 14,654. See also Heinrichs,

"Turkey Farm" and covert, 315 a. 1 r. 13 p., f.. 9,000



Winslow, &c., Bucks.—"Roddimore Farm" and covert, 104 a. 3 r. 25 p. f. ....	£1,900	Prince's-rd., f.g.r. of 564. 10s., reversion in 68 yrs. ....	£1,490	Pimlico.—40 and 44, Beesborough Gardens, u.t. ....	£1,040
Little Horwood, Bucks.—"O'Garra's Enclosure," 23 a. 1 r. 4 p. f. ....	467	King's-rd., f.g.r. of 124, reversion in 83 yrs. ....	300	35 yrs., g.r. 184, r. 134. 10s. ....	
"Oakley Farm," 21 a. o. 30 p. f., r. 504. ....	900	Pittard-rd., &c., f.g.r. of 212. 2s., reversion in 72 yrs. ....	602	Ladywell.—Railway-ter., f.g.r. 564. 10s., reversion in 65 yrs. ....	880
Shenley Brook End, Bucks.—Enclosures of land, 18 a. 1 r. 2 p. f. ....	990	Pollard-pl., f.g.r. of 104, reversion in 63 yrs. ....	285	By WREIFORD & DIXONS.	
Swanbourne, Bucks.—"Nearon End Farm," 34 a. 3 r. 34 p. f. ....	3,500	Brighton.—3, Royal-cs., f. r. 044. ....	1,825	Regent's Park—37, Osnauburg-st., u.t. 25 yrs., g.r. 47. 5s. r. 504. ....	600
By FEN & CO. (at Dedham).		38, Regency-sq., f. r. 1024. 8s. ....	1,500	Kensington.—West Kensington Gardens, i.g.r. 214. 4s. 6d., u.t. 55 yrs., g.r. 134. ....	170
"Venn Farm," 61 a. o. 33 p. f. ....	500	Aylesford, Kent.—"The Coddow Estate," 126 a. 3 r. 25 p. f. ....	10,000	26 and 28, West Kensington Gardens, u.t. 55 yrs., g.r. 204, r. 254. ....	3,590
A cottage and four-tenement house, c. ....	290	Enclosure of land, 12 a. 3 r. 0 p. f. ....	620	West Kensington Gardens, a set of stabling, u.t. 55 yrs., g.r. nil, r. 754. ....	850
Enclosures of land, 15 a. 3 r. 35 p. f. ....	4,400	East Malling, Kent.—Enclosure of land, 1 a. 3 r. 10 p. f. ....	420	Hyde Park—15 and 16, Hyde Park Gate, u.t. 46 yrs., g.r. 244. 8s., r. 254. ....	3,175
"East House Farm," 49 a. 2 r. 20 p. f. and c. ....	2,500	House and shop and nine cottages, f. ....	1,085	Kensington.—Logan-pl., i.g.r. 754, u.t. 56 yrs., g.r. nil. ....	1,650
By J. KITTOV (at Launceston).		Two freehold orchards, 10 a. o. r. 17 p. ....	1,575	Brompton.—49, Brompton-sq., u.t. 25 yrs., g.r. 104, r. 904. ....	750
Thrushelton, &c., Devon.—The Manor or Lord- ship of Downcary, with its rights, privileges, &c. ....	150	A freehold homestead, 5 a. 2 r. 13 p. ....	800	July 2.—By J. CARTER JONES & SONS (at Cambridge).	
Broadwoodwidge, Devon.—"Venn Moor Planta- tion" and lands, 104 a. 2 r. 25 p. f. ....	510	An enclosure of hop land, 12 a. 2 r. 34 p. f. ....	900	Mellourne, Cambs.—"The Lordship Farm," 472 a. 1 r. 0 p. f. ....	5,200
"Venn Farm," 61 a. o. 33 p. f. ....	708	Peacock Row, six cottages, f. ....	740	"The Heath" and "Munceys" Farms, 500 a. 2 r. 28 p. f. ....	3,600
"Coombehead Farm," 28 a. 2 r. 17 p. f. ....	400	By G. B. SMALLPRICE (at Woking).		"The Lodge" and 6 a. o. 24 p. f., r. 604. ....	2,100
"Higher Coombehead Farm," 28 a. 2 r. 17 p. f. ....	400	Woking, Surrey.—Chobham-rd., &c., seven build- ing plots, f. ....	855	By ELWORTH & SONS (at Wisbech).	
Two freehold cottages and a. 2 r. 37 p. ....	102	Commercial-rd., "Saunders' Cottages," f. ....	660	Newton, &c., Cambs.—A freehold estate, com- prising 305 a. 3 r. 24 p. (in lots) ....	13,303
Virginow, Devon.—"The Hare and Hounds" Farm, 12 a. 2 r. 17 p. f. ....	350	Knap Hill, two houses and two cottages, f. ....	815	By STEWELL & BARNES (at Norwich).	
Various enclosures, 26 a. o. 10 p. f. ....	298	Guilford-rd., two residences, f. r. 324. 10s. ....	400	Rockland St. Mary, &c., Norfolk.—A freehold and copyhold estate, comprising 55 a. o. 35 p. (in lots) ....	1,228
Two freehold cottages and a. 2 r. 16 p. f. ....	100	Star Hill, "Fair View," f. r. 254. ....	400	Alburgh, Norfolk.—"The White House Farm," 117 a. 1 r. 17 p. f. ....	1,400
"Virginow Town Farm," 84 a. 3 r. 24 p. f. ....	1,405	By HEPPER & SONS (at Leeds).		By MACQUINE & MERRY (at North- ampton).	
"Crown's End Farm," 28 a. 2 r. 17 p. f. ....	14	Leeds.—94, 95, and 96, Briggate, area 1,074 yds., f. r. 404. ....	16,700	Lower Heyford, Northants.—Three enclosures of land, 30 a. 2 r. 17 p. f. ....	2,015
By THOMPSON & CO. (at Holworthy).		By BAXTER & LEPPERS (at St. Albans).		By PROTHROCK & MORRIS (at Reading).	
"Damerel, Devon.—"White Bear Farm," 35 a. 2 r. 17 p. f. ....	800	Sydenham.—Sydenham-rd., "Malvern House," f. Homecroft-rd., 61 building plots, f. ....	1,690	Cholsey, Berks.—The Cholsey Nurseries, 8 a. 3 r., July 4.—By C. RAWLEY CROSS & CO.	1,300
"Lower Courts Farm," 14 a. 2 r. 25 p. f. ....	515	By DICKSON & MARTIN (at Dover).	5,850	Shepherd's Bush—Lxbridge-rd., a building site, u.t. 76 yrs., g.r. 84. ....	1,430
Various enclosures, 75 a. 3 r. 10 p. f. ....	515	Shepherdswell, Kent.—Various enclosures, 48 a. 3 r. 25 p. f. ....	1,570	Pentonville.—14, Percy-circus, u.t. 34 yrs., g.r. 64, r. 604. ....	625
Trydell, "The Mount," "Plas-Yu-Mhory's Farm," 92 a. f. ....	3,000	A freehold cottage and a. 3 r. 10 p. ....	250	Shepherd's Bush—65, Wood-lane, u.t. 76 yrs., g.r. 74. 10s., r. 104. ....	380
Pengryon Holding, 20 a. f. ....	660	By SENEAL & BARNES (at Bangor).		Notting Hill—150, Portobello-rd., u.t. 634 yrs., g.r. 94, r. 604. ....	650
Mold.—41, Bridge-st., and three houses in Conway-st., 11 a. o. 8 p. f. ....	490	Ilkeshall, St. Lawrence, Suffolk.—"The Hannah Barn Farm," 96 a. 3 r. 10 p. f. ....	1,110	By FORTESCUE & BRANSON.	
By N. W. ROBINSON (at Boxmoor).		Various enclosures and a cottage, 36 a. 1 r. 10 p., and c. ....	493	Shepherd's Bush—17, Rylett-rd., u.t. 79 yrs., g.r. 124, r. 604. ....	665
Hemel Hempstead, Herts.—Various enclosures of land, 50 a. 2 r. 2 p. f. (in lots) ....	4,395	By FULLER, MOORE & FULLER (at Cam).	178	Maida Vale.—133, Sutherland-av., u.t. 79 yrs., g.r. 164. ....	950
Willoughby, Warwick.—"Spraggett's Farm," 50 a. o. 39 p. f. ....	3,175	Farleigh, Surrey.—Main-rd., eight building sites, f. ....	178	Paddington—57 to 73 (odd), Praed-st., u.t. 554 yrs., g.r. 2104, r. 1304. ....	9,205
Various enclosures, 41 a. 2 r. 1 p. f. ....	2,740	Mitcham, Surrey.—"The Carillon" Printing Works" and "Caxton Cottages," u.t. 42 yrs., g.r. 254, r. 754. 2s. ....	380	Maida Hill—3, Northwick-ter., u.t. 254 yrs., g.r. 26. 10s., r. 1154. ....	1,150
Sawridge, Warwick.—"Went's Close" and 74 cottage, 17 a. o. 28 p. f. ....	490	Caterham, Surrey.—"The Harrow" p.-h. f. and c. ....	1,875	Notting Hill—127, St. Mark's-rd., u.t. 764 yrs., g.r. 104, r. 554. ....	410
By G. J. ROBINSON & THOMPSON (at Northallerton).		Oxted, Surrey.—Enclosures of land, 15 a. 1 r. 3 p. f. ....	2,510	By T. W. OFFIN.	
Brompton, Yorks.—"Newstead Farm," 154 a. 2 r. 14 p. f. ....	2,100	By THOMPSON & CO. (at Charnmouth).	338	Barling, Essex.—A freehold house and shop, with oil-licence. ....	750
June 30.—By CHESTERTON & SONS.		Charnmouth, Devon.—Higher Sea-lane, &c., 14 freehold building sites ....	930	Billerica, Essex.—"The Rising Sun" p.-h. and c. r. 304. ....	3,700
Kensington.—61, Addison-rd., u.t. 53 yrs., g.r. 14, r. 104. ....	2,430	By HUNT & PEDDAR (at Stowmarket).	760	Runnell, Essex.—"The Home and Stacey's Farms," 68 a. 1 r. 1 p. f. and c. ....	850
By J. G. DEAN & CO.		Battisford, &c., Suffolk.—A freehold farm, 52 a. 2 r. 38 p. f. ....	210	By WREIFORD & DIXONS.	
Balham.—33, 35, 37, 39, Sarsted-rd., u.t. 84 yrs., g.r. 304, r. 104. ....	950	Battisford, Suffolk.—A freehold farm, 21 a. 1 r. 38 p. f. ....	750	Hammersmith—160, King-st., f. r. 404. ....	1,085
By LEVISON, EDWARDS, & HENWARD.		Old Newton, Suffolk.—A farmhouse and 11 a. 3 r. 20 p. f. and c. ....	270	Enfield.—1, The Parade, f. r. 604. ....	1,300
Limhouse.—24, Gough-st., u.t. 34 yrs., g.r. 24. 10s., r. 304. ....	230	Four tenements, plot of garden ground, and 9 a. 2 r. 26 p. f. and c. ....	209	Richmond, Surrey.—101 to 111 (odd), Kew-rd., u.t. 71 yrs., g.r. 654, r. 3904. ....	5,425
Dalston.—3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999, 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019, 1021, 1023, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039, 1041, 1043, 1045, 1047, 1049, 1051, 1053, 1055, 1057, 1059, 1061, 1063, 1065, 1067, 1069, 1071, 1073, 1075, 1077, 1079, 1081, 1083, 1085, 1087, 1089, 1091, 1093, 1095, 1097, 1099, 1101, 1103, 1105, 1107, 1109, 1111, 1113, 1115, 1117, 1119, 1121, 1123, 1125, 1127, 1129, 1131, 1133, 1135, 1137, 1139, 1141, 1143, 1145, 1147, 1149, 1151, 1153, 1155, 1157, 1159, 1161, 1163, 1165, 1167, 1169, 1171, 1173, 1175, 1177, 1179, 1181, 1183, 1185, 1187, 1189, 1191, 1193, 1195, 1197, 1199, 1201, 1203, 1205, 1207, 1209, 1211, 1213, 1215, 1217, 1219, 1221, 1223, 1225, 1227, 1229, 1231, 1233, 1235, 1237, 1239, 1241, 1243, 1245, 1247, 1249, 1251, 1253, 1255, 1257, 1259, 1261, 1263, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1279, 1281, 1283, 1285, 1287, 1289, 1291, 1293, 1295, 1297, 1299, 1301, 1303, 1305, 1307, 1309, 1311, 1313, 1315, 1317, 1319, 1321, 1323, 1325, 1327, 1329, 1331, 1333, 1335, 1337, 1339, 1341, 1343, 1345, 1347, 1349, 1351, 1353, 1355, 1357, 1359, 1361, 1363, 1365, 1367, 1369, 1371, 1373, 1375, 1377, 1379, 1381, 1383, 1385, 1387, 1389, 1391, 1393, 1395, 1397, 1399, 1401, 1403, 1405, 1407, 1409, 1411, 1413, 1415, 1417, 1419, 1421, 1423, 1425, 1427, 1429, 1431, 1433, 1435, 1437, 1439, 1441, 1443, 1445, 1447, 1449, 1451, 1453, 1455, 1457, 1459, 1461, 1463, 1465, 1467, 1469, 1471, 1473, 1475, 1477, 1479, 1481, 1483, 1485, 1487, 1489, 1491, 1493, 1495, 1497, 1499, 1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1519, 1521, 1523, 1525, 1527, 1529, 1531, 1533, 1535, 1537, 1539, 1541, 1543, 1545, 1547, 1549, 1551, 1553, 1555, 1557, 1559, 1561, 1563, 1565, 1567, 1569, 1571, 1573, 1575, 1577, 1579, 1581, 1583, 1585, 1587, 1589, 1591, 1593, 1595, 1597, 1599, 1601, 1603, 1605, 1607, 1609, 1611, 1613, 1615, 1617, 1619, 1621, 1623, 1625, 1627, 1629, 1631, 1633, 1635, 1637, 1639, 1641, 1643, 1645, 1647, 1649, 1651, 1653, 1655, 1657, 1659, 1661, 1663, 1665, 1667, 1669, 1671, 1673, 1675, 1677, 1679, 1681, 1683, 1685, 1687, 1689, 1691, 1693, 1695, 1697, 1699, 1701, 1703, 1705, 1707, 1709, 1711, 1713, 1715, 1717, 1719, 1721, 1723, 1725, 1727, 1729, 1731, 1733, 1735, 1737, 1739, 1741, 1743, 1745, 1747, 1749, 1751, 1753, 1755, 1757, 1759, 1761, 1763, 1765, 1767, 1769, 1771, 1773, 1775, 1777, 1779, 1781, 1783, 1785, 1787, 1789, 1791, 1793, 1795, 1797, 1799, 1801, 1803, 1805, 1807, 1809, 1811, 1813, 1815, 1817, 1819, 1821, 1823, 1825, 1827, 1829, 1831, 1833, 1835, 1837, 1839, 1841, 1843, 1845, 1847, 1849, 1851, 1853, 1855, 1857, 1859, 1861, 1863, 1865, 1867, 1869, 1871, 1873, 1875, 1877, 1879, 1881, 1883, 1885, 1887, 1889, 1891, 1893, 1895, 1897, 1899, 1901, 1903, 1905, 1907, 1909, 1911, 1913, 1915, 1917, 1919, 1921, 1923, 1925, 1927, 1929, 1931, 1933, 1935, 1937, 1939, 1941, 1943, 1945, 1947, 1949, 1951, 1953, 1955, 1957, 1959, 1961, 1963, 1965, 1967, 1969, 1971, 1973, 1975, 1977, 1979, 1981, 1983, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, 2021, 2023, 2025, 2027, 2029, 2031, 2033, 2035, 2037, 2039, 2041, 2043, 2045, 2047, 2049, 2051, 2053, 2055, 2057, 2059, 2061, 2063, 2065, 2067, 2069, 2071, 2073, 2075, 2077, 2079, 2081, 2083, 2085, 2087, 2089, 2091, 2093, 2095, 2097, 2099, 2101, 2103, 2105, 2107, 2109, 2111, 2113, 2115, 2117, 2119, 2121, 2123, 2125, 2127, 2129, 2131, 2133, 2135, 2137, 2139, 2141, 2143, 2145, 2147, 2149, 2151, 2153, 2155, 2157, 2159, 2161, 2163, 2165, 2167, 2169, 2171, 2173, 2175, 2177, 2179, 2181, 2183, 2185, 2187, 2189, 2191, 2193, 2195, 2197, 2199, 2201, 2203, 2205, 2207, 2209, 2211, 2213, 2215, 2217, 2219, 2221, 2223, 2225, 2227, 2229, 2231, 2233, 2235, 2237, 2239, 2241, 2243, 2245, 2247, 2249, 2251, 2253, 2255, 2257, 2259, 2261, 2263, 2265, 2267, 2269, 2271, 2273, 2275, 2277, 2279, 2281, 2283, 2285, 2287, 2289, 2291, 2293, 2295, 2297, 2299, 2301, 2303, 2305, 2307, 2309, 2311, 2313, 2315, 2317, 2319, 2321, 2323, 2325, 2327, 2329, 2331, 2333, 2335, 2337, 2339, 2341, 2343, 2345, 2347, 2349, 2351, 2353, 2355, 2357, 2359, 2361, 2363, 2365, 2367, 2369, 2371, 2373, 2375, 2377, 2379, 2381, 2383, 2385, 2387, 2389, 2391, 2393, 2395, 2397, 2399, 2401, 2403, 2405, 2407, 2409, 2411, 2413, 2415, 2417, 2419, 2421, 2423, 2425, 2427, 2429, 2431, 2433, 2435, 2437, 2439, 2441, 2443, 2445, 2447, 2449, 2451, 2453, 2455, 2457, 2459, 2461, 2463, 2465, 2467, 2469, 2471, 2473, 2475, 2477, 2479, 2481, 2483, 2485, 2487, 2489, 2491, 2493, 2495, 2497, 2					

## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Water Supply Scheme.....	Athy (Ireland) Union	1/2 1/4 ..	Aug 1
Water Supply Scheme.....	Personation (Ireland) Town Commissioners	Not stated.....	No date

## CONTRACTS.

[illegible]

### CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Sewerage Works Hale .....	Backlow I.D.C. ....	J. E. Wapley, Barr. T. Mar ket-street, Altrincham ..	July 25
Road Materials .....	Hayward's Brick U.D.C. ....	W. Keogh, Council's Office Soulham-square ..	do.
Street Works, Repairs Park-road ..	.....	W. B. O. Bonnett, C.E. Municipal Office ..	do.
Main Sewers .....	Thorncroft U.D.C. ....	E. Parnell, Surveyor-Gen. City Offices ..	do.
*Twenty-nine Houses .....	County Board, Westham .....	Stratford, R. ....	do.
*MacKinnon Street .....	do. ....	do. ....	do.
*Sewers, Manholes, &c. ....	do. ....	do. ....	do.
*Ten Shop Closets .....	do. ....	do. ....	do.
*Electrifying, &c. at Sewage Works ..	do. ....	do. ....	do.
*Road Making and Paving .....	Southall Newwood U.D.C. ....	H. R. Fell, Esq., High-st. Southall ..	do.
*Additions to Workhouses, Upper Barnet .....	Stratford Union .....	W. E. Cross & Kewick, Arch'ts, 25, Outer Temple, Strand ..	do.
*Tank at Sewage Works .....	Beaconsfield Corp. ....	Beaconsfield, Esq., R. Brown, Town Hall ..	July 27
Electric Light System, Burn-road ..	West Hartlepool Corp. ....	J. W. Brown, 170, King Edward-street, Newcastle ..	do.
Settling Tank, Sewers, &c. ....	Bourne (Lincs.) R.D.C. ....	C. W. Ball, Councils Office ..	July 28
Pumping Station .....	County Corp. ....	J. Mansergh, Esq., Victoria Road, Westwood-street, A.C. Kettering ..	July 29
*Greenhouse .....	Kettering U.D.C. ....	A. E. Canall, 45, High- st. Canterbury ..	July 30
*Granite Monument .....	Mary's Memorial Church, Canterbury .....	J. B. D. Cox, Town Hall, Canterbury ..	Aug. 1
*Underground Conveyance .....	.....	.....	Aug. 2
*Lime Stone Tarp Paving .....	Hamsey Wood U.D.C. .....	J. N. Moreland, Office, Hutton Road, Canterbury ..	Aug. 3
Additions to Schools .....	Maxey Sch. Bd. ....	G. J. Stables, Office, Hutton Road, Canterbury ..	do.
Workhouse Infirmary, Bathpore ..	Nottingham Union .....	Arch'ts, Peterborough A. Marshall, Arch't King- street, Nottingham ..	Aug. 6
Police Station, Staple Hill, nr. Bristol	Gloucester Handing Committee ..	G. H. Sturt, Arch't, 15, Clarendon-st., Gloucester ..	do.
*Superintendence of Workhouse, &c.	Nottingham Cottage .....	Nottingham ..	do.
*Erection of School .....	Swansea U.D.C. Bd. ....	G. E. T. Laurence, 191, High-st., Swansea ..	Sept. 19
Additions to Schools, Bailey-street, Shops, &c. Wallington, Wigan ..	R. Sutton, Esq., A. Peck ..	A. Harrison, Arch't, 39, High-st., Wigan ..	No data
Additions to National Schools, New port, Salsbury ..	.....	Brusnahan & Gann, Arch'ts, 1, Victoria-st., Wigan ..	do.
Build detached Villas, Stables, &c.	H. H. Capes .....	A. Leal, Arch't, 31, Dar- lington-street, Newport ..	do.
Alterations to New Crown Hotel, Sutton, Stafford ..	Hole & Co. ....	A. A. Gibson, Arch't, Barnes Green, Darlington ..	do.
Hotel, Wauwiler, Victoria, Mon. ....	.....	Valance & Westwick, White Horse, Darlington ..	do.
Chimney 15 yards, Horwich ..	A. Mason & Son .....	Chimney, Mansfield ..	do.
Paving, Plough, &c. York-street ..	Audenhaw (Lancs.) U.D.C. ....	Swainall & Gresham, Arch'ts, Dock, Newport ..	do.
Schools, Ushaw Moor, near Durham ..	Steele & Partners ..	.....	do.
Eight Shops, &c. Market Hall ..	Bolton Corp. ....	.....	do.
Additions to Infirmary, Broom field ..	.....	.....	do.
Villa, West End, Balfour ..	.....	.....	do.
Albert Hall, Bingley, Yorkshire ..	.....	.....	do.
Roads and Sewers, Knowle Park, Bristol ..	.....	.....	do.
Croft House, West Yarmouth ..	.....	.....	do.
Factory, Ouseburn ..	.....	.....	do.
Rehabilitating Hotel, Park-lane, Leeds ..	.....	.....	do.
Box House, Woodland-avenue, Bel- fast ..	.....	.....	do.
Converting Shops into Houses, Palla- sade, Belfast ..	.....	.....	do.
Three shops and Houses, Keshville, Belfast ..	.....	.....	do.
Church Tower (St. Peter's), Plymouth	.....	.....	do.
Boards, Colchester ..	.....	.....	do.
Shop, St. Botolph's-street, Colchester	A. J. Lucking & Co. ....	.....	do.
Drainage Works .....	Burham-on-Crouch U.D.C. ....	.....	do.
Church (St. Saviour's), Wilmington, Kent ..	.....	.....	do.
Village, All Saints' Church, Hap- pold, Kent ..	.....	.....	do.
Additions to Wesleyan Chapel, Lox- ford, Kent ..	.....	.....	do.
Alterations to Business Premises, George-street, & Cork ..	Manor Co. op. Supply Assoc., Ltd. ....	.....	do.
House and Two Cottages, Oguness Stables, &c. Roughton, Dunmoe, Essex	H. Calver .....	.....	do.
.....	O. Bernard .....	.....	do.

### PUBLIC APPOINTMENTS.

Nature of Appointment	By whom Advertised.	Salary.	Application to be in.
Temporary Draughtsman (Surveyor's Dept.)	Hockney Vectors	2 ann. weekly	July 19
Confidential Assistant.	Burton-on-Avon Corp.	180. per annum	July 20
Surveyor	South Warwick Vectors	3000. plus 50. per cent.	July 20
Storekeeper	Bethnal Green Vectors	24. per week, house, coal, and gas	July 21
Headline Inspector	Middlebrough Corp.	75. 5s. per annum and house,	July 23
Superintendent of Bridge Removal	U.D.C.	and gas	Aug. 1
District Surveyor.	Sheffield Corp.		No date

Those marked with an asterisk (\*) are advertised in this Number. Competition, p. — Contracts, pp. iv, vi. & viii. Public Appointments, pp. xvi, xvii, & xix.



\_\_\_\_\_

WEST HAM.—For repainting and painting seven schools, for the School Board. Mr. W. Jacques, Architect to the Board, 2, Fen-  
church, E.C.

	Clapnet (1898) In and out	Cave road, In and out	Custom House Exterior	Hermi- road In and out	High- street In and out	Edness road In and out	1 phone- one Interior	Godwin- road Parti non
Chapman & Burton	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0	2 3 0
Foley, Hunt & W...	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0	4 0 0
Fisher	—	—	—	—	—	—	—	—
Grob & Co., Poplar	—	—	—	—	—	—	—	—
Gresham & Son, Stratford	—	—	—	—	—	—	—	—
Madison	—	—	—	—	—	—	—	—
Morse & Stratford	—	—	—	—	—	—	—	—
Nash	—	—	—	—	—	—	—	—
Reed & Son	—	—	—	—	—	—	—	—
Shirley	—	—	—	—	—	—	—	—
St. John & Son	—	—	—	—	—	—	—	—
White & Wright, Plawton	—	—	—	—	—	—	—	—

\* Accepted

ROMFORD.—For the erection of two houses and various other  
works in North-street, Romford, for Mr. E. Schwenker, Mr. J.  
Kennedy, architect, 25, Bedford-row, W.C.

Norton	—	—	—	—	—	—	—	—
Bell & Son	—	—	—	—	—	—	—	—
Baily	—	—	—	—	—	—	—	—
Hosier	—	—	—	—	—	—	—	—
Mannard & Son, Romford	—	—	—	—	—	—	—	—

RUBON (Wales).—For addition, &c., to school, Acrefair, for  
the School Board, Messrs. J. Morris, Architects, King  
street, Wrexham. Quantities by the architects.

J. Davies	—	—	—	—	—	—	—	—
Levins & Jones	—	—	—	—	—	—	—	—
W. E. Samuel	—	—	—	—	—	—	—	—

RUSHDEN.—For alterations and addition to shoe factory, for  
Messrs. Green & Son, Messrs. M. J. & Anderson, architects,  
Northampton.

F. Henry	—	—	—	—	—	—	—	—
Hailey & Sons	—	—	—	—	—	—	—	—
Palmer	—	—	—	—	—	—	—	—
Whittington & Tomlin	—	—	—	—	—	—	—	—

SHERBORNE (Dorset).—For the erection of a residence, Mr.  
T. Farrell, architect, St. John's Chambers, Sherborne.

Lyle & Son	—	—	—	—	—	—	—	—
Roswell & Son	—	—	—	—	—	—	—	—

STANDGROUND (Hants).—For rebuilding, &c., the Old County  
Bridge (Horsey Bridge), for the County Council. Mr. E. Burson,  
County Surveyor, 125, High-street, Huntingdon.

Liddons & Freeman, Usdine	—	—	—	—	—	—	—	—
---------------------------	---	---	---	---	---	---	---	---

WORMLEY (near Brixworth).—For proposed alterations and  
addition to the Wormley National School, Wormley, near Brix-  
worth, Herts. Messrs. Newman & Newman, architects, 31, Foley-  
street, London Bridge, S.E.

A. Rendon	—	—	—	—	—	—	—	—
G. Archer	—	—	—	—	—	—	—	—
W. Wolard	—	—	—	—	—	—	—	—
J. Stewart	—	—	—	—	—	—	—	—
W. Lawrence	—	—	—	—	—	—	—	—
Mann & Sons	—	—	—	—	—	—	—	—

WREXHAM.—For the erection of chapel and school-room at  
Messrs. Messrs. Davies & Moss, architects, 11, Regent-street,  
Wrexham.

Turner Bros	—	—	—	—	—	—	—	—
C. S. Roberts	—	—	—	—	—	—	—	—
W. Owen	—	—	—	—	—	—	—	—

Rich H.—We are informed that the tender of Messrs.  
Lee & Son, High Wycombe, for the construction of a precipitation  
tank for the Lower Council, has been withdrawn, and that the  
tender of Mr. G. H. Gibson, of the same town, has been accepted.  
The list of tenders was printed in our last issue.

**C.B.N. SNEWIN**  
MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and TIMBER MERCHANT,  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
HATTON GARDEN, and 29, BAY STREET,  
FARINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
Telephone No. 74 Holborn. Tele. Address: "SNEWIN, London."

## TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, and papers read at  
public meetings, rests, of course, with the authors.  
We cannot undertake to return rejected communications.  
Letters or communications (beyond mere news items) which have  
been duplicated for other journals are NOT DESIRED.  
We are compelled to decline pointing out books and giving  
addresses.

Any communication to a contributor to write an article is given subject  
to the approval of the article, when written, by the Editor, who  
reserves the right to reject it if unsatisfactory. The receipt by the  
author of a proof of an article in type does not necessarily imply its  
acceptance.  
All communications regarding literary and artistic matters should  
be addressed to THE EDITOR; those relating to advertisements  
and other exclusively business matters should be addressed to THE  
PUBLISHER, and not to the Editor.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from  
the Office to residents in any part of the United Kingdom, at the  
rate of 10s. per annum PREPAID. To all parts of Europe, America,  
Australia, New Zealand, India, China, Ceylon, &c., 12s. per annum.  
Remittances (payable to DODGINS & SON, DRUMHEAD) should be  
addressed to the publisher of "THE BUILDER," No. 45, Catherine-  
street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (by  
prepaying at the Publishing Office, 10s. per annum or  
4s. 6d. per quarter), can ensure receiving "The Builder,"  
by Friday Morning's Post.

**W. H. Lascelles & Co.,**  
121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

**HIGH-CLASS JOINERY,  
LASCELLES' CONCRETE**

Architects' Designs are carried out with the  
greatest care.

**CONSERVATORIES,  
GREENHOUSES,  
WOODEN BUILDINGS,**

**Bank, Office, & Shop Fittings,  
CHURCH BENCHES & PULPITS.**

**ESTIMATES GIVEN ON APPLICATION.**

## THE BATH STONE FIRMS, Ltd.

BATH.  
FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

**HAM HILL STONE.  
DOULTING STONE.**

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son,  
The Doulting Stone Co.)

Chief Office:—Norton, Stoke-under-Ham,  
Somerset.  
London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava  
Asphalte Company (Mr. H. Glenn), Office, 42,  
Poultry, E.C.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-rooms,  
granaries, tun-rooms, and terraces. Asphalte  
Contractors to the Forth Bridge Co. [ADVT.]

**SPRAGUE & CO., Ltd.,**  
LITHOGRAPHERS,

Employ a large and efficient Staff especially for  
Bills of Quantities, &c.

4 & 5, East Harding-st., Fetter-lane, E.C. [ADVT.]

**QUANTITIES, &c., LITHOGRAPHED**  
accurately and with despatch.

**METCHIM & SON**, 8, PRINCE STREET,  
ST. GEORGE'S WESTMINSTER.  
"QUANTITY SURVEYORS' DIARY AND TABLES."  
For 1898, price 6d. post 7d. In leather 1/- Post 1/4 [ADVT.]

**Ernest Mathews & Co.**  
61, St. Mary Axe, E.C.

**SLATES, SLABWORK,  
Enamelled Slate,  
Marble,**

**Permanent Green Slates.**

WORKS:  
Bow, London, E. and  
Aberllefenny, North Wales.

BRANCH HOUSE:  
37, Victoria-street, Bristol.

**PILKINGTON & CO.**  
(ESTABLISHED 1838),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.

Telephone No., 2751 Avenue

Registered Trade Mark,

**Polonceau Asphalte.**

PATENT ASPHALTE and FELT ROOFING.  
ACID-RESISTING ASPHALTE.

WHITE SILICA PAVING.  
SEYSSSEL ASPHALTE.

# BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

## DIRECTORS.

**CHARLES CREMER, Esq.,** Faversham, Kent, Brick Manufacturer.  
**R. L. CURTIS, Esq.,** 120, London-wall, E.C., Brick Manufacturer.  
**GEO. H. DEAN, Esq., J.F.,** of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.  
**E. W. GOODENOUGH, Esq.,** 37, Walbrook, E.C., Brick Manufacturer.  
**A. J. KNIGHT, Esq.,** Rainham, Kent, Brick Manufacturer.  
**HY PACKHAM, Esq.,** of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.  
**A. RUTTER, Esq.,** of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
**J. WILLSON, Esq., J.P.,** of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
**GEO. E. WRAGGE, Esq.,** of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—**E. J. COLEBY, Esq.,** 148, Gresham House, Old Broad-street, E.C.



## ILLUSTRATIONS.

Sketches of Old Hampstead.—By Mr. P. L. Forbes .....	Extra Large-Page Ink-Photo.
The Sir John Cass Technical Institute.—Mr. Arthur W. Cooksey, A.R.I.B.A., Architect .....	Double-Page Photo-Litho.
Old Malthouse, &c., converted into Club and Residence, Streatham.—Mr. W. Ravenscroft, F.R.I.B.A., Architect .....	Double-Page Photo-Litho.
New House, Goring-on-Thames.—Mr. W. Ravenscroft, F.R.I.B.A., Architect .....	Single-Page Photo-Litho.
The "Old White House," Oxford.—Mr. H. T. Hare, A.R.I.B.A., Architect .....	Single-Page Photo-Litho.
Chequer's Mead, Northaw.—Mr. John Richmond, Architect .....	

## Blocks in Text.

Sketch Plan of English Wood Stage.....	Page 72	Sketch Plan of French Wood Stage .....	Page 72
Sketch Plan of German Wood Stage .....	" 72	"Flemish" Theatre, Brussels. Transverse Section of Stage.....	" 72
Electric "Turntable" Stage .....			Page 73

## CONTENTS.

Behind the Scenes .....	71	Sketches of Old Hampstead.....	81	General Building News .....	82
Notes .....	74	The Sir John Cass Technical Institute.....	82	Sanitary and Engineering News.....	83
The Architectural Association Summer Visits: "Swakeleys," near Uxbridge .....	76	Old Malthouse, &c., Streatham, Berks. Converted into Village Club and Residence.....	80	Foreign .....	84
The National Trust for Places of Historic Interest and Natural Beauty: Annual Meeting .....	76	The "Old White House," Oxford .....	83	Miscellaneous .....	84
The London County Council .....	77	Chequer's Mead, Northaw .....	81	Capital and Labour .....	85
Metropolitan Asylums Board .....	78	Books Received .....	80	Legal .....	85
Applications under the 1894 London Building Act .....	78	The Students' Column: Sound, Light, and Heat.—IV. .....	81	Meetings .....	85
Competitions .....	79	Correspondence .....	82	Recent Patents .....	85
Archaeological Societies .....	79	Obituary .....	82	Some Recent Sales of Property.....	86
				Prices Current of Materials .....	87
				Tenders.....	87

## Behind the Scenes.



HERE has been of late years, in this country, an increasing tendency to regard theatrical entertainments more and more from the spectacular point of view.

It really amounts to this, in fact, that the mass of theatre-goers will put up with mediocre acting, or acting which, however careful and conscientious, is totally devoid of genius, on consideration of having the play mounted with effective and sumptuous scenery. The modern prevalence of the actor-manager has largely fostered this tendency. An actor-manager does not like to be cast into the shade by having any actor in his company superior to himself; but he does not feel so jealous of the scenery, and consequently is led to depend on sumptuous scenery to carry off mediocre or perfunctory acting. At the same time, the system of long runs favours the same tendency by making it commercially possible to spend an amount of money on scenery and decoration which is spread over many months' performance, which would be ruinous and impossible for scenery which was only to be used occasionally or for a short run. The recent get-up of *Julius Cæsar* in a London theatre was a typical instance. We devoted a short article to the scenery, which was exceptionally good and on which considerable pains had been spent, both in an archaeological and an artistic sense; and the result was a popular success. Yet there was not a touch of real genius in the acting, from first to last.

This being the popular attitude at present, the appearance of a book on the machinery and appliances by which stage effects are produced\* seems well-timed, unless indeed the general reader feels that he would rather be content with seeing the effects without inquiring how they are produced; an inquiry which does not always enhance one's respect for the result. If however, our audiences want elaborate and realistic scenic effects, it is desirable that the best and most con-

veniently workable means should be made use of to produce them. And here comes in Mr. Sachs's main point, in the book which forms the Appendix to his large work on Theatres, viz.: that in England we are much behind the age in stage appliances and machinery, and are content with a *modus operandi* which has been far surpassed in various Continental theatres.

Stage mechanism may be regarded as divided into two main groups, the floor of the stage itself and its under mechanism, and the mechanism above the level of the stage, including the method of arranging the scene-cloths. The stage floor and its arrangement principally governs the plan of Mr. Sachs's book, as he divides it under the three heads of "Wooden Stages," "Wood-and-iron Stages," and "Iron Stages," but variations in other departments of the mechanism go more or less hand in hand with the stage floor construction. The stage floor, even in its simpler forms, is a very peculiar structure. Its essential desideratum is that when required it should present an unbroken surface for the actors to walk about on, but that it should be capable of being opened and pierced in a variety of ways for the passage of scenery or the ascent and descent of actors. In its typical and simplest form the English wooden stage, or the central portion of it, displays a series of openings parallel with the front of the stage, narrow grooves covered by sliders—long narrow pieces which can be moved forward or backward from the side scenes, and which when moved back leave narrow openings through which a scene-cloth can be raised or lowered. Alternating with these narrow openings are wider ones termed "bridges," where the floor is moved not backwards and forwards but up and down vertically, working against permanent corner posts beneath the stage. This represents the general principle of stage floor arrangement; the variations in Continental and in one or two English theatres are variations in detail and in working appliances rather than in principle.

Mr. Sachs, who has probably given more attention to the subject than any other English architect, represents the typical English theatre as exceedingly clumsy and primitive in its stage mechanism and construction. One difficulty is indeed almost inseparable from the circumstances

under which London theatres are built. Scene-cloths have to descend as well as ascend, hence the depth of the well under the stage should by rights be at least equal to the height of the proscenium opening. But in London considerations of drainage oppose great difficulties in the way, especially when the system is adopted of sinking the pit and stage beneath the street level in order to arrange the access more conveniently for the audience. The bridges are raised and lowered by hand-worked drums, windlasses and pulleys. There are also separate rising pieces or "rostrums," useful for giving variations in height and forming the groundwork for special pieces of built-up scenery. The author observes "the way these built-up scenes are put together is really too surprisingly primitive. The scenes, 'profile pieces,' &c., are fixed to the stage by means of a wooden brace with a screw inserted at one end in the wooden framework of the 'flat,' and at the other end in the stage floor. By this means the scenes are held upright, but the stage floor is being constantly pierced and worn with small holes, and looking as though it were worm eaten." This is the method which has superseded the "grooves" referred to as being more common to the older stage. The grooves are elsewhere described as wooden frames grooved and hinged, so as to take up and down, and in which the tops of the scenes are held, as in a fork. This seems a constructional form of support, but the use of them resulted in the necessity of having all the pieces of scenery at right angles with the side walls of the stage; probably in the main for this reason they are now nearly discarded. Mr. Sachs remarks elsewhere that the whole construction of traps, "sliders" and "bridges," in an English wood stage is of the most primitive description; and he complains also that up in the flies (the side galleries, sometimes in two or three tiers, from which the scene cloths are worked), many things, such as the belaying attachments for ropes, are still made of wood which might far better and with more convenience be of iron. A constructional difficulty is also mentioned in regard to the wooden story-posts which ascend from the cellar to carry the beams of the stage. They cannot be braced or trussed together from back to front, because the space between them is required to be clear

\* "Stage Construction." By Edwin O. Sachs. London: B. T. Batsford. 1898.

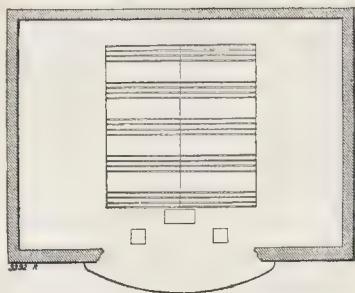


Fig. 1.—Sketch Plan of English Wood Stage.

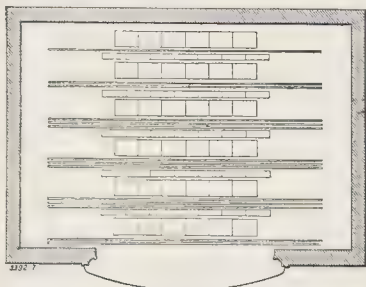


Fig. 2.—Sketch Plan of German Wood Stage.

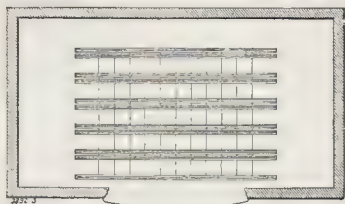


Fig. 3.—Sketch Plan of French Wood Stage.

(From Mr. Sachs's "Stage Construction.")

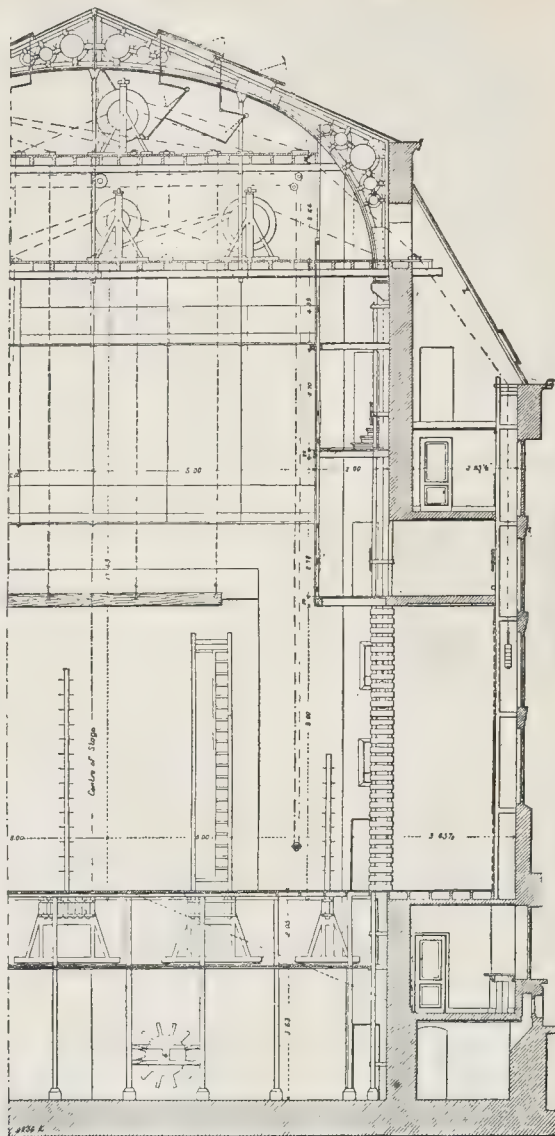


Fig. 4.—"Flemish" Theatre, Brussels. Transverse Section of Stage.

for the storing of scenery; consequently they are fastened together from back to front on the hook-and-eye principle, with connexions like old-fashioned iron shutter-bars. Naturally these do not secure the uprights altogether against a tendency to move, but it is worth note that since the by-laws compelled the introduction of a thick solid wall between the stage and the auditorium, a much greater rigidity has been obtained for the stage supports, the solid wall acting as a buttress to them. One point as to English and Continental habits in scene painting is mentioned, which we were not aware of. While the English scene-painter does his work on a canvas hung vertically, and which can be moved by means of ropes and pulleys

so as to enable him to get at any part he wants, all scene-painting abroad is done on a cloth laid horizontally on the floor of an extensive paint-room, the painter walking across it (we presume in slippers) to whatever part he wishes to work on. This saves machinery, no doubt, but how does he see the relation of each portion to the general effect?

In commencing the chapter on Continental wood stages, the author gives typical plans showing the leading characteristics of the English, German, and French wooden stage respectively, which it will be useful to reproduce here. The English plan shows the "sliders" or "bridges," with the orthodox trap doors near the front, of which the larger

central one is known as "the grave trap," being always used when a grave has to be dug, as in the familiar scene in Hamlet.

The difference immediately between the English and French wood stage (figs. 1 and 3) is that the bridges are not in one piece, but are divided crosswise into a number of nearly square pieces, each one of which can be raised and lowered independently. It will be immediately seen what a far greater flexibility this gives to the stage arrangements, and why the conventional fixed traps of the English stage can be dispensed with, since each section, or each two or three sections, of any "bridge," forms an independent trap in itself. Also, between the sliders is a slightly wider opening which is intended



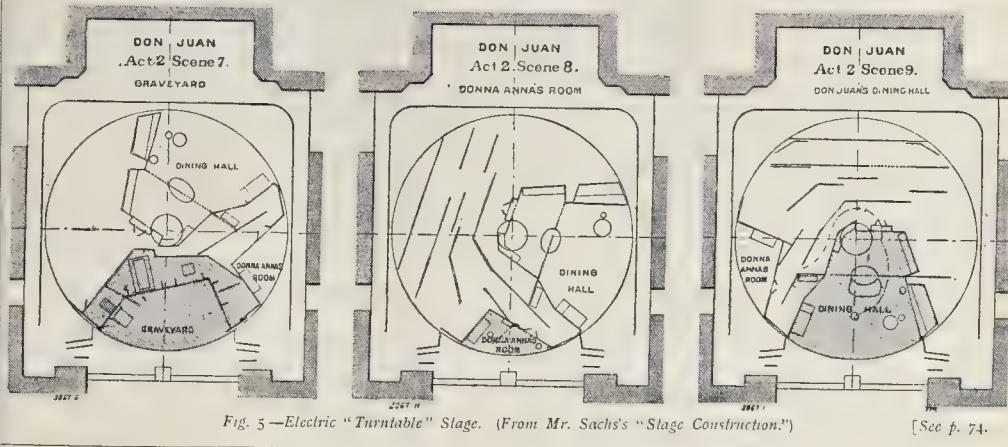


Fig. 5.—Electric "Turntable" Stage. (From Mr. Sachs's "Stage Construction.")

[See p. 74.]

for the "chariot and pole," described by the author as "a special feature in all foreign stage machinery."

"Explained in brief, the 'chariot and pole' comprise a framework under the stage floor, with an upright, or 'pole' passing through and above the floor. The 'chariot' travels on wheels running on a line of rails, and by this means the 'pole' can be moved along the 'slit' from one side of the stage to the other. The adoption of this appliance has several advantages over the English 'brace,' which has been referred to in connexion with the 'flats,' and which is fastened by a screw on the stage floor. A 'scene' can be fixed to the 'pole,' and can be easily moved, either on the stage or on the mezzanine level,\* by pushing the frame along the rails referred to."

The German type of stage floor (fig. 2) is still more complicated, having three classes of openings, and the chariot slit, rather wider, being divided up like the bridge, into separate sections. In these stages upright supports for scenes can thus be moved anywhere from side to side of the stage, only in parallel lines it is true, but in so many planes that a position can be got for almost any requirement; and moreover they have a good supporting base in the chariot below, as shown in the section of the Flemish theatre, Brussels (fig. 4), where three of the "chairs" are seen, with uprights for different purposes ascending from them.

This is a great improvement on the English wooden stage, but even so the winding-up arrangements below the stage, worked by a number of large wooden drums or windlasses, with projecting wooden arms for turning them, are primitive enough, and must require, for an elaborate scene work in a large theatre, an army of workmen. The view of the "cellar" of the Paris Opera House, with the mass of drums and ropes, given in Mr. Sachs's book, has a formidable appearance of complication and of something quite the reverse of economy of labour.

We must pass over the author's intermediate chapters on wood and iron stages, and come to the group which is specially contrasted with the wooden stages, and spoken of as the iron stage, the term as there used implying "the use of metal in the construction of the appliances, and some motive power other than manual labour in its working." Of such stages it is stated that there is not one example in England so far. The first theatre used to illustrate this class of stage, the Municipal Theatre at Amsterdam, shows

a stage floor arranged on the old principle but with much more complication of sliders and opening surfaces, and the whole of the floor is supported on iron joists running from side wall to side wall, these walls being very solid, and with only such openings as are necessary for the performance of the business of the stage. The "bridges" are constructed of iron framing, but with a wooden floor or platform (an important point for acoustic reasons). This, however, is still a manual labour stage; and in fact the author, a few pages further, seems rather to recede from his position as to the necessity of superseding manual labour by mechanical power, and points out that some of the best recent stages of the iron type are worked by manual labour.

The most radical proposal for machine-working is what is known as the "Asphaleia" system (*ἀσφάλεια*—"safety" or "stability"). By this system the stage floor is divided into a number of portions, each of which is attached to a vertical hydraulic elevator beneath it:—

"Every opening extends right across the stage, and its width is divided into three sections. Each one of these rests on the plunger of a hydraulic press, and each section cannot only be lowered but also raised, either alone or along with the other two. These movements are effected by opening or closing stop-cocks which regulate the flow of water kept under constant pressure. As it is possible to raise or lower, now one side now the other side of the floor to a given extent, there can be produced a 'see-sawing' of the surface as a whole, or of any one section of it, with a precision and a perfect absence of danger attainable in no other way. There are many other possible combinations too numerous to describe. The traps can be arranged one after the other as a succession of steps, for bridges, balconies, mountains, ships, or for the stories of a house. Most of the clumsy timber work, 'rostrums,' 'trestles,' &c., previously in use are considered to have become quite unnecessary."

Thus the stage, under this system, becomes a movable surface which can be manipulated in any direction; moreover this can all be done by one man who, controls the hydraulic machinery; and the use of ropes, which are often so much in the way, is dispensed with. It is no wonder that the patentees of such a system considered they had initiated a complete reform in stage mechanics. Mr. Sachs thinks that they puffed their system too strongly, which is very likely, but that fact does not in itself discredit the excellence of an invention. The effects of the reform appear, observes the author, far more evident

in actual working than any drawing or description can make them. To take one instance only—there is no staff detailed for the flies (at the Municipal Theatre Halle), no work having to be done above stage floor level. On the other hand, it appears that some of the leading theatre experts of Germany have found serious drawbacks in the Asphaleia system. The acoustic properties of the stage thus formed are not very good (that we should expect); the assemblage of vertical rams fills up the space immediately under the stage, where freedom of movement is desirable, in a very inconvenient manner; and actors have received injuries from the rising of a platform propelled by hydraulic power, over the movement of which they have no control and which is too powerful for them to arrest. Mr. Sachs considers the second objection, the absorption of valuable space by the hydraulic rams, as a serious one, and it has led to the employment in one or two modern theatres of what may be called a modification of the Asphaleia system, in which hydraulic power is used, but the hydraulic rams are at the side of the space under the stage, and actuate the bridges by ropes and pulleys—what the author calls the "crane" system as against the ram system. We do not see very much force in the other objections, but perhaps one would have to be a stage manager for a time to form a full practical estimate of the advantages and drawbacks of the system. Commercial economy it may not secure, since the initial outlay is much more than for an ordinary manual stage, and the few men employed must be expert artisans and machinists, at much higher wages than are paid to the ordinary stage carpenter. But economy of labour and precision of action it is certainly calculated to secure, and it seems to us almost self-evident that hydraulic machinery must before long take the place generally of the old manual system.

Connected with the Asphaleia system, or a part of it, is the attempt to get something better than the "sky-border" as a representation of the sky, by the employment of a panorama cloth at the back of the stage, called the "horizon," which runs round the back of the stage and part of each side, but is curved on plan, so as to avoid an angle. On this it is proposed that the whole sky of an outdoor scene should be painted. It appears that even before this suggestion the

\* The working level immediately below the stage.

German stage mechanics, to get rid of the square joint between the "sky border" and the "wings," had employed a continuous piece of canvas representing wings and border in one; or, as the author says, in other words a "back-cloth" with its centre cut out in profile. We confess it has always seemed to us surprising that scenic artists and stage managers could have been so long content with so wretched a device as the sky-borders, like a successive set of cloths hung out to dry; unless on the principle (which may no doubt be maintained) that stage scenery is only an accepted convention, not intended to produce any real illusion.

A very important and ingenious system to which a chapter in Mr. Sachs's book is devoted, is Herr Lautenschlaeger's electrically-worked turntable system, as installed at the Munich Court Opera House. The principle of this is to build up upon one very large turntable as many as possible of the scenes required in one piece, the scenes looking different ways and radiating, more or less irregularly, from the centre of the turntable. By these means all the scenes required, perhaps, in a whole opera, may be successively presented by merely actuating the turntable, without any pulling down and erecting of scenes and any waits between the acts. The plans of three successive scenes for "Don Juan" (Fig. 5) show the manner in which this system is carried out. It does not appear that it could well be made to serve either a very large theatre, or a piece in which large and elaborate scenic effects were an important portion of the show; but for a medium-sized theatre and for the class of pieces, whether in opera or drama, where the chief interest turns on the *dramatis personae*, and the scenes are merely to represent the surroundings of actual life—a street, a garden, or a sitting-room, and not a dance of fairies on a magic lake, it seems a system most practical and valuable, and certainly likely to be welcomed by an audience, who could thus have the piece gone through almost without a pause, instead of having three or four blank intervals of fifteen minutes or more to sit through.

As we hinted just now, the position that theatrical scenery is not intended to be, and need not attempt to be, an illusion, is at least arguable, and the point is touched on by Mr. Sachs in his introduction, but in a rather uncertain spirit. On one page he says that if we accept a rose-bush cut out of thin boards ("rather too obviously in two dimensions," as was remarked at a University play), we ought to be satisfied with an actor whose wig is so badly fitted that we could see the natural hair beneath it. On the next page he suggests that the object both of actor and scenery is to *simulate* Nature; that this, as opposed to actual reproduction of Nature, is the object of stage art; and that a real tree upon the stage looks less like a real tree from the auditorium than a tree painted on a piece of canvas. This reminds one of the story of the machinist who prided himself on his effect of thunder, and on hearing a genuine peal of thunder appealed to the audience—"Isn't mine better thunder than that?" We may admit that a real tree would look out of place on the stage, because nothing on the stage is real; and therefore we rather question whether Professor Herkomer's patent moon and his carved cobble-stones, which are referred to, are much to the purpose. The stage surround-

ings can never be made real, any more than stage conversations are real; the whole thing is life shown under an artistic convention. Professor Herkomer says the light from the footlights is an unnatural light; so it is, and that is just one virtue of it, the other being that it separates the actors from the audience, and prevents their attention being distracted. Professor Herkomer urged, and Mr. Sachs apparently follows him, that there should be a kind of inner frame to the proscenium opening, so that a room in a cottage should be represented in its true relative proportions as compared with a banquetting-hall in a palace. We see no objection but one; with an audience seated not only on the ground floor but up to the roof of the house, there would be some difficulty in arranging the small room so that every one should equally well see and hear the actors. If there is a desire for this piece of realism however, we may suggest that Herr Lautenschlaeger's turntable scenery affords a good opportunity of carrying it out. But the importance of the point is overrated. Do the best you can, a stage cottage will always remain a stage cottage; realism as to size will not produce any illusion: nor do we want to see a real cottage room. What we want is to see the play of human feeling and passion; it is sufficient if the surroundings are fairly suggestive of the situation.

It is another matter in the case of what are really spectacular plays and operas, where a purely idealised effect of spectacle is one of the main attractions. That is a special form of art, and a very charming one in its way; and that does require very elaborate machinery to carry it out in the best manner. Mr. Sachs shows us plainly that our English methods for producing such spectacular effects are clumsy and out of date, both in regard to the production of the desired effect and the most convenient and safe manner of working. In this relation his book has great practical value, and should be studied by theatre architects and stage managers. It is not very clearly or symmetrically written, and we have a little trouble sometimes in getting at the precise information which is meant to be conveyed; but the information is all there.

#### NOTES.

Employers' Liability in Quarries.

THE new Employers' Liability Act has led to considerable agitation in quarries by reason of the masters in many cases having issued stringent rules for the men's observance. Here is an example: The men are forbidden to ride upon any waggon or trolley, particularly up or down any incline; they are to take more notice of the regulations in force at the quarry respecting blasting operations; they have to bear in mind the rules and regulations respecting storing, keeping, or handling powder or other explosive; and they are specially cautioned against doing or committing any act or thing not authorised by or coming within the scope of their employment. If any of the rules in this notice are broken the employers will consider it as "serious and wilful misconduct" within the meaning of the Act, and will contend that they are not liable for any compensation under the Act. But the most serious notice from the men's point of view is that all elderly workmen and other employees are required to use

extra vigilance in the performance of their duties, and they are particularly requested not to take any avoidable risk, or "the directors will consider the question of their suspension as a class, having regard to the enormous liability thrown upon the Company by the provisions" of the Act. It is very evident that the latter part of this notice, if generally adopted by employers, will be a serious thing for the elderly men. It is notorious that the old hands are often the most dilatory in getting under cover during blasting operations; the constant presence of danger has rendered them callous to it. Neither are they always as careful as they might be in avoiding waggons on inclines and the like. We fear that the time is not far distant, even if it has not already come, when, owing to the operations of this Act, employers will not be able to keep old workmen in such dangerous operations as quarrying stone.

The L.C.C. Works Department.

THOSE people who hoped that the London County Council election in March would terminate the seemingly endless discussion on the Works Department of that body will be disappointed when they read the report of the discussion at the Council meeting on Tuesday. In March the Manager of the Works Department reported that he was prepared to undertake the work of the superstructure of Horton Asylum at 284,445*l.*—3,000*l.* more than the architect's cube estimate and 10,000*l.* higher than the total bills priced by the quantity surveyor. The Committee therefore advertised for tenders, with the result that three were received, the lowest of which was 12,000*l.* higher than the works manager's estimate; whereupon the Asylums Committee, ignoring the tenders of the contractors, reported in favour of the work being given to the Department. This proposal was ultimately agreed to, though it called forth a vigorous protest from that hitherto staunch supporter of the Works Department, Sir John Hutton. That the Department has undertaken a large and responsible work is obvious, and in view of the rise in prices since the works manager's estimate was made, that estimate is likely to be exceeded. In any case, the undertaking will finally decide whether or not the Department is capable of profitably carrying out the Council's work, and so put an end to the wearisome discussions on the subject.

St. Jude's Church, Southwark.

FOR the rebuilding of this church Mr. W. J. H. Leverton has been appointed as architect. Situated in St. George's-road—on the north side, close to Colnbrook-street—it was originally the chapel of the Philanthropical Society, founded in 1788 by the Duke of Leeds, Robert Young, and others. They first opened a house at Cambridge Heath, Hackney, and shortly afterwards removed to a site near the Obelisk in St. George's Fields, leased to them by the Corporation of London. The Society, incorporated in 1806, built the chapel in 1804-6, at a cost of 9,300*l.* In 1849-50, they erected a new Reformatory for juvenile offenders at Earlswood, near Redhill. When they left London the chapel was consecrated and dedicated to St. Jude.

The Sunderland Fire.

THE Sunderland fire appears to show that in some important towns there is not sufficient attention paid to the apparatus



necessary in case of fire. The increased size of modern buildings has made efficient fire apparatus more than ever necessary; but this necessity is in many places not sufficiently realised. Valuable buildings may thus be destroyed, which might otherwise be only damaged slightly. The matter is one which most concerns fire insurance companies, who might in turn very well make some stipulation by which they should bring pressure to bear on local authorities where the fire-extinguishing apparatus is not up to the mark. As a matter of fact, the risk is distinctly greater in localities where public attention is not paid to the question of engines, hoses, and fire-drill, and in truth in such places the premium should be higher than it is, or else in places where the matter is properly managed the premium on houses and their contents should be lower.

**Electric Lighting in London.** THE refusal of the Select Committee of the House of Commons last week, just as we went to press, to confirm the provisional order made by the Board of Trade under which the Vestry of Marylebone was empowered to supply electricity in competition with the Metropolitan Electric Supply Corporation is of much importance. The view of the Committee appears to be that the Corporation has practically a monopoly, and that by its original agreement with the Vestry, by which it was allowed to supply electric light in Marylebone, the Local Authority is debarred from competing with it, though it may buy out the Corporation. We are not prepared to disagree with this decision, which depends on a consideration of the terms made with the Corporation before it began its operations in the parish. It is not pleasant, however—bearing in mind how the water monopoly has worked—to contemplate an electric light monopoly. It would seem to be desirable that there should be some general legislation on the subject so that when a Local Authority desires to supply electric light it may be able to pay out a private company on reasonable terms. As private bodies have been the pioneers of electric lighting they are entitled to fair treatment, but not to an undue share of public money.

**Electric Railway for Paris.** It is announced that on the new extension of the Orléans Railway Company between Place Walhubert and the Quai d'Orsay, the trains are to be drawn by electric locomotives of 700 horse-power, actuated by a current from a central electric station, conveyed by brush contact with a conductor so arranged as to be inaccessible to the public. The experiment is looked to with considerable interest, as electric traction has so far only been applied in France to ordinary trams.

**Low Temperature Research.** THE explorations which Professors Fleming and Dewar have made during the last seven years into the field of low temperature research have resulted in a collection of facts and accurate quantitative measurements which have greatly broadened the foundations of physical science. It will be remembered that a few years ago they proved that the electrical resistance of a pure metal is proportional to its temperature measured from the absolute zero of temperature (460 deg. below the zero of Fahrenheit's

thermometer); they have now proved that the magnetic susceptibility of various substances varies inversely as their temperatures measured on the absolute scale. By weighing silver, bismuth, and glass balls suspended in a vessel of liquid oxygen placed on the pole of a powerful electromagnet, first when no current was on and then when the magnet was strongly excited, they deduced that the magnetic susceptibility of liquid oxygen was 2,418 times greater than that of the gas at the standard temperature and pressure. Now, the density of liquid oxygen is 806 times that of gaseous oxygen, and its temperature is 296 degrees below zero Fahrenheit, or 164 degrees counting from the absolute zero. We see, therefore, that its temperature is only one-third that of oxygen at the freezing point (492 deg. absolute), and hence, multiplying 806 by 3, we get the exact figure found by Professors Fleming and Dewar experimentally. It is extraordinary that the law holds even when the oxygen has undergone a change of state from the gaseous to the liquid condition. The Professors are to be congratulated on having overcome so many difficulties, and on having proved a law which promises to be a great aid in dissipating the mystery which still surrounds the most simple magnetic phenomena.

**Acetylene at Earl's Court.** MUCH public attention is being attracted to the acetylene exhibits at the International Exhibition at Earl's Court, London, where the methods by which acetylene may be generated and used as a source of light in buildings, cycle lamps, motor-car lamps, and search lights are on view. The most interesting and extensive exhibit is that of the Acetylene Gas Light, Power, and Calcium Carbide Company, Limited, which includes a considerable extent of actual acetylene gas lighting within the exhibition grounds. The representative of this company, when questioned as to the cost of a small generator for a private house, replied that, roughly speaking, the cost was about 1*l.* per-light; thus, to provide for six lights would cost about 6*l.*; for ten lights about 10*l.* The burners used by this company for ordinary lighting purposes are of the Naphey type, but those used for optical lanterns bear more resemblance to the Bray gas burner, although in place of the two minute holes in the top of the burner is a small slit across the centre, which may be freed from soot, when necessary, by means of a fine saw. The appliance shown for boiling water in a kettle or other utensil is a ring burner with small luminous jets, which are not allowed actual contact with the bottom of the kettle. It is claimed for acetylene that coloured fabrics, pictures, and flowers appear precisely the same by acetylene gas-light as by day-light, and as the heat and vitiation of the atmosphere produced by, say, a 40-candle acetylene flame is much less than that produced by a 40-candle coal-gas flame, it is evident that, even at its present price, there are many places where acetylene may with advantage be used.

**The Explosion at Earl's Court.** It was particularly fortunate for the metropolis that the explosion which occurred at Earl's Court on Monday afternoon should have happened at a time when the auditorium was empty, as there is little doubt that the

intonation, not to speak of the fire, might have caused a panic with disastrous results; but the event, serious enough in itself, should serve as an object-lesson as to allowing even the storage of small quantities of explosives in the close vicinity of a large public hall. The Earl's Court authorities were apparently able to obtain a fresh supply of explosives at short notice for their evening performance on Monday, and they should be able to regularly draw their supplies from outside once a day without any serious inconvenience. But why should the explosive store be next to the theatre at all, when there is a very considerable amount of waste ground on the property where it could be more safely housed? With a little more forethought from a fire preventive point of view, such hazards as these could be avoided by the management.

**Water Supply, Worcester.** DR. W. W. E. FLETCHER'S report to the Local Government Board on the recent prevalence of diphtheria in Worcester, and on the sanitary circumstances and administration of the city, leads to the conclusion that pollution of water supply is at the root of the mischief. The whole city is now supplied by public service, owned by the Corporation, but the water is still drawn from the River Severn at a spot about 20 yards above the outfall of the Barbourne Brook, and on the same side of the river. This spot is about a mile and a quarter (1 mile 572 yards) above the Worcester Severn Bridge. The intake is by one or other of two pipes, or possibly by both, through which the water is pumped to one or other of two subsidence tanks. But in consequence of the limited capacity of the clear water tank and of the service reservoirs, water has constantly to be taken in from the river, however low, or in whatever state of flood it may be. The Severn in its course above Worcester receives the drainage of a very large area, and upon its banks, and upon the banks of its tributaries, are many towns and villages which must of necessity contribute to pollution of its waters. Evidence is furnished, from recent reports by the Board's Inspectors, of pollution of the Severn by the discharge into the stream of crude sewage, and by the tipping of ashes and house refuse on to its banks in the Bewdley Urban District, and in the Kidderminster Rural District; and the experience of the Medical Officer of Health at Gloucester, Dr. Campbell, goes to confirm this: "I regret to have to announce that since the Severn water has had to be used a large increase has taken place in the number of typhoid fever cases notified in the city. I do not pretend to say positively that the Severn water is the cause, but I can find no other explanation for it, and I am informed that this disease is prevalent in towns farther up the river, and which drain their sewage into it."

**The Monument to M. Alphonse.** AFTER the death of M. Alphonse, who took such an important part in contriving and carrying out squares, streets, gardens, and sanitary improvements in Paris, and who was a man with a real genius for administration in this kind of enterprise, a committee was formed to erect a monument to his memory; M. Formigé was commissioned to design the architectural portion, M. Dalou was to submit a model for the sculpture, and the Municipal Council selected a site for the



monument at the entrance to the Bois de Boulogne, which in its present aspect was almost the creation of Alphonse. This was some years ago, but not even the pedestal has been commenced, and it is stated that the necessary funds have not been subscribed. This seems rather an ingratitude towards the memory of a man to whom the success of the 1889 Paris Exhibition was so largely due.

#### THE ARCHITECTURAL ASSOCIATION SUMMER VISITS:

"SWAKELEYS," NEAR UDBRIDGE.

On the 16th inst. this most interesting old house was visited by a party of members of the Architectural Association. The present approach to the house is poor, as the road winds out of the direct course and comes to the front in a sidelong direction. There is indication, however, in the grass of the park that the road has been altered at some period, and that it formerly came up to the house as a straight line of at least some quarter of a mile at right angles to the line of the western front of the building, terminating in a wide, sweeping circle before the entrance. The loss of dignity to the approach by the disappearance of this feature is very great, and it is much to be wished that it could be restored.

The house itself is an extremely interesting example of domestic architecture, having been built in 1638, as the dates on the heads of the rain-water pipes bear witness. The style of the building shows the transition from the late Jacobean work to the more severe Classic which followed upon it. The materials are red brick with dressings in part of stone, this giving way to plaster dressings upon the brick in the upper portions and in the less important parts of the ground story of the building. Some of the quoins at the angles are of stone on the ground story; those above are of plaster upon the brick. These quoins are quite regular as in the generality of Classic revival work. In the same way the window mullions, which are of marble below, are of brick covered with plaster above and in the less important parts. The windows are mullioned, and some are bayed in plan, but the lights are filled with wooden frames and casements set into rebates in the mullions, and having transverse cross bars only. The days of leaded lights seem to be left behind, and the use of sliding sashed windows not to have penetrated into the country. There are, however, two such windows in the ground floor of the south front, but whether they are of the date of the building of the house it is not safe to say. There are also very large old sash windows in the orangery.

The plaster dressings of the house are Classic in style of mouldings; they are of a reddish-brown colour, and are very uneven in outline; a modern plasterer would say they are very "badly run," but the effect is rather pleasing than the reverse. They are used over the whole building, even to the parapets of the gables, and on the chimneys, which have their angles decorated with plaster muntings, and it may be that they also had caps of the same material, but the tops are out of repair, and no existing caps were to be seen. The plaster strings round the house are on bricks, moulded or rubbed to shape. While speaking of the chimneys it may be mentioned that the stacks are in most cases taken up in one fine mass to about the roof ridge level, and the flues then displayed by being set diagonally, thus forming most picturesque clusters of shafts, and showing the mediæval influence that still made itself felt at the time when the house was built. The numerous gables with which the upper part of the elevations are finished show a curious mixture of Renaissance and Classic influences. The plan also relates, to a certain extent, the earlier tradition, it being H-shaped in the main, and having the principal entrance and the garden entrance in the centres of the opposite sides of the cross bar of the H, the two entrances being connected by the chief passage of the house. On the north side of this passage lie the offices, and on the south the hall and other chief rooms. From the centre of the chief passage, and at right angles to it, runs another passage going north and communicating with the kitchens and other working parts of the house, and ending at the back yard door. The line of this passage continued, passes across the square stable yard,

out between two sets of coach houses, and down an avenue terminating in a gateway on the public road. The stables and coach houses and other outbuildings seem to be of the same date as the house, and they form a fine and stately arrangement, which has, unfortunately, been somewhat spoiled by the promiscuous building, from time to time, of larders and other ill-considered erections on the back of the house.

Returning to the main passage of the house there are, on its south side, the hall, near the entrance, and separated from the passage by a screen of wood constructed and painted to simulate stone, the dining-room, the library, and a morning-room or boudoir.

The hall screen is decorated on the inner side by busts of Charles I., Fairfax, and Lord Essex, the former flanked by two lions couchant, and on the passage side by other busts. The walls of the hall are panelled with large panels of oak. There is a very large fire opening now partly occupied by a big "Gurney" gill stove, behind which can be seen an immense cast-iron fire back. The mantel is of marble with large bold mouldings, and approaching the style of the mantels at Hampton Court.

The dining-room, which is next to the hall, is completely panelled in small panels of oak, as used in the Jacobean and Elizabethan periods. The architraves of the doors are in a later style; but it is impossible to say whether both were executed at the same period and at the building of the house; the result, however, is to mark the transition period of the building.

The library occupying the south-east angle of the south front has large panels again, the framings being decorated with appliqué detached pieces of carving, and the whole painted to imitate oak; whether originally intended to be so was not ascertained.

At the east end of the central passage the grand stair rises over the garden entrance. This stair is lit by windows which have been designed and placed wholly with a view to outside effect, and quite failing to express the fact that they light a stair, thus showing the advent of the formality of the Classic Revival. The stair itself is of carved oak, but from a brief inspection alone it is difficult to say whether it is old or of recent date. Its walls and ceiling are entirely covered with paintings in the style of Verrio, and put on wholly without reference to the doors and other architectural features.

At the top of this stair a door leads into the great drawing-room, which occupies the whole central portion of the west front on the first floor. This is a fine room about 55 ft. by 30 ft. The walls are covered with large panels painted white. The ceiling is divided into large panels deeply set between heavy beams. The latter are used with plaster ornamented with the appliqué, very much bringing to mind those in the ceiling of the Banqueting House at Whitehall. There are a number of interesting old portraits on the walls of this room. A smaller drawing-room opening out of the end of the large one is panelled in small oak panels similar to those in the dining-room, but almost entirely covered in recent times with canvas and paper. The other rooms are of no particular interest. There is, near the foot of the stair, a good specimen of cast-iron work in a tall iron stove designed in the style of the Adams.

The orangery is situated near the north end of the east front, and forms the end of the east range of the stable buildings. It is very similar to the old orangery at Hampton Court. The garden entrance doorway has rubbed brick Corinthian pilasters, now painted over. Another item of interest is a simple wrought-iron gate leading to the walled vegetable garden. The flower garden does not present anything of special interest in garden design, and the disposition of the ornamental water was not ascertained. Photographs of the house have been published in Messrs. Belcher & Macartney's book on the architecture of England subsequent to the Renaissance.

Of the history of the house, other than what may be gathered from a study of it as a building, it is not intended to refer at any length, but, perhaps, it may be mentioned that Pepys speaks in his Diary of having been entertained there by Sir R. Viner (or Vyner) on September 7, 1665. Lysons says the house was built by Sir Edmund Harrington by his marriage with the daughter of Sir Edmund Wright, and was sold by him to Sir Robert Vyner (some time Lord Mayor of London) in 1665.

Pepys' account is as follows:—"To Swakely

to Sir R. Viner's. A very pleasant place bought by him of Sir James Harrington's lady. He took us up and down with great respect and showed us all his house and grounds; and it is a place not very moderne in the garden nor house, but the most uniforme in all that ever I saw, and some things to excess. Pretty of the country, the scene of the hall set up by Sir J. Harrington, a Long Parliament-man) the King's head, and my lord of Essex on one side and Fairfax on the other; and upon the other side of the screen the parson of the parish and the lord of the manor and his sisters. The window cases, door cases, and chimneys (2 chimney pieces) of all the house are marble. . . . After dinner Sir Robert led me up to his long gallery, very fine, above stairs (and better or such furniture I never did see!)"

The party derived great pleasure from their visit to this house, which is most interesting as a link in the chain of the architectural history of the country, and, as it does, of the earlier Renaissance work, the work of the banqueting house at Whitehall and the later work at Hampton Court. It is a matter for congratulation that the owners of such architectural treasures as this are willing to allow access to them for all who are genuinely interested in their study; and the hearty thanks of the Association are due to Mr. Barrett, the owner of Swakeleys, for his kind permission to view it.

W. B. H.

#### THE NATIONAL TRUST FOR PLACES OF HISTORIC INTEREST AND NATURAL BEAUTY: ANNUAL MEETING.

The annual meeting of the National Trust for Places of Historic Interest and Natural Beauty was held on Wednesday at Grosvenor House, W. The Duke of Westminster (the President of the Trust) occupied the chair. The minutes of the previous meeting having been read and confirmed, Canon Rawnsley (Hon. Secretary) presented the Report of the Council.

After stating that there had been a steady growth of membership, the Report went on to enumerate the properties that had been acquired during the year. These were Toy's Hill, in Kent, and the Joiners' Hall, at Salisbury. Dealing first with Toy's Hill, the Council mentioned that the members of the Trust had long desired that they should secure one of the headlands of Kent or Surrey overlooking the Weald, and commanding a view of the hills, as these promontories were being rapidly purchased for building purposes and enclosed. During the past year this wish had been, in a measure, fulfilled by Mr. and Mrs. Richardson Evans and their relatives, who had given to the Trust, in memory of Mr. Frederick Feeney, some land on the spur of Toy's Hill, which afforded an uninterrupted view over the blue distance to the South Downs. The adjoining piece of land on the spur had been presented to the Trust by a member of the Council, Miss Octavia Hill. With regard to Joiners' Hall, Salisbury, the Council stated that on hearing that the building was for sale Messrs. H. E. Luxmore and E. L. Vaughan, of Eton, advanced to the Trust a sufficient sum of money to purchase the house and execute certain repairs, in return for a low rate of interest, which is secured upon the rent of the house, the National Trust being the holders and administrators of the property. The Council were also glad to be able to report that they had at last succeeded in obtaining the sum necessary for the completion of the work at Alfriston. A responsible tenant had been found for each of the two cottages into which the building was divided, and negotiations were now being carried on with the Ecclesiastical Commissioners for obtaining a lease for twenty-one years of a further portion of the garden in which the building stands, to ensure its greater privacy and better preservation. In the work of repair great praise was due to the architect, Mr. A. Powell, for the conscientious care with which he had carried through a most difficult task. The hope of enlarging the Trust's property at Barmouth had for the present been reluctantly abandoned. The Council also referred to the possibility that, through the death of the Marquis of Worcester's Monmouthshire estate, an opportunity would arise for acquiring a piece of property of national interest, Tintern Abbey. The Trust also hoped to become the trustees of the site of Duffield Castle and an old Columbarium at Garway. Duffield Castle was at one time an important stronghold near Derby. At the present moment little remained but the foundations of a huge rectangular Norman keep, and it was proposed by the two gentlemen who had acquired the property to transfer the remains, with the grounds surrounding them to the extent of about four acres, to the care of the Trust. The grounds would be used as a public garden and recreation ground, and while the management would



vested in a local body, a permanent impersonal guardianship would be secured by vesting the property in the Trust. The Columbarium at Garway, near Ross-on-the-Wye in Herefordshire, is a good stone dovecot, said to have once belonged to the Knight Templars. It stands now in a farmyard, and the owner is desirous of transferring it to the safe keeping of the Trust. The Council also reported upon a number of instances in which action had been taken to prevent injury and destruction. Referring to the Victoria Embankment Extension Bill, which dealt with a site which was the very home of history, the Council mentioned that it offered uncompromising opposition to the measure. Turning from buildings to scenery, the Trust had during the year been in opposing three railway projects—the extension of the Great Western Railway from Enley to Great Marlow, the Lynnmouth and Minehead Light Railway, and the Portmadoc, Aberglaslyn, and Beddgelert Light Railway. As regards the construction of railways, would it not be better to follow the method which Continental experience had shown to be comparatively harmless, and lay the rails on the existing high roads rather than, as in the case of the projected railway through the Pass of Aberglaslyn, to make a new one which is but a big railway in miniature, with a tunnel and bridges and embankments encroaching upon the bed of the river Glaslyn at the most beautiful point in the Pass? There were, alas! too many instances in which interesting and beautiful objects had been, or are on the point of being, lost. Among these cases the report mentioned the ancient Camp at Uphall, Essex, the Clava Stones and Church-tower at Aberglaslyn. In conclusion, the report stated that during the coming autumn an endeavour would be made to prepare one or more measures for the consideration of Parliament. In the direction of compiling a register of interesting buildings and objects of great value had been done in London by Mr. R. Ashbee's society, shortly known as the "Antiquarian Society." The London County Council had also asked Parliament for power to purchase and to protect buildings and objects of historic and architectural interest in London. Such action on the part of the foremost Local Authority in the kingdom was a valuable indication of the drift of public opinion, and could not be too highly commended.

The Duke of Westminster, in moving the reception and adoption of the Report said, as to the Abbey, that there were no funds at present available for the projected purchase, but at the opportunity, if it presented itself, would be so unique that he had no doubt but that the public would show a zeal towards purchasing the Abbey. The most creditable achievement in the way of destruction—and which the Council had long tried to avert—had been that the Falls of Foyers. Unfortunately the Falls are now dried up, and the factory worked by the water was the centre of the emission of evil fumes, which had killed all the spruce firs in the neighbourhood. He could not conceive of any stronger local spirit for the preservation of the Falls did not assert itself. His Grace also referred to the efforts of Miss Octavia Hill to complete the purchase money for the Postman's Park, in what was, perhaps, the densest part of London—St. Martin-le-Grand.

Canon Rawnsley, who seconded the motion, remarked that they were very desirous of quickening public interest in the objects of the Trust. Their progress had been very satisfactory, but there still remained much to be done. In reviewing the work of the year, the Council laid emphasis upon the destructive nature of the projected line in the most beautiful part of north Devon and Somerset. The proposed light railway from Minehead to Lynmouth could not, he conceived, be in the interests of the British public, for its construction would mean the closing of some of the most beautiful estates en route, while the increasing coach-drive between Porlock and Lynmouth would cease to be. They were feeling anxious as to the future of the historic Christ's Hospital. The suggestion had been made, and was apparently received with a certain amount of favour, that this site would be an admirable one for a central railway station. The adoption of such a scheme would, however, be deplorable. Mr. Sydney Waterlow had suggested the conversion of the hospital buildings into the proposed University of London; or they might be required for a useful purpose as a memorial to the late Mr. Gladstone. With regard to the Church-row, Hampstead, he was pleased to say that the scheme, as adopted, was very much modified from that which was originally prepared. There were a number of instances in which structures of great pretensions had been threatened with destruction. One of these was a country inn the "White Horse" at Maiden Newton,

Dorchester. The Council felt it a duty to protest against the way in which, in every town and village, the old and picturesque inns were, in the interest of dividends, being demolished to give place to what were thought to be up-to-date structures. Canon Rawnsley also mentioned that he had succeeded in getting a cross erected at Whitby, in honour of Caedmon, the first English Christian poet.

Sir Wilfrid Lawson thought the Society might be called with appropriateness the "Anti-Goth-and-Vandal League." For himself, he held, and held strongly, that it was the duty of the Government to see that places of historic interest and natural beauty were taken care of by a Department of the State. It required a very strong hand, indeed, to protect such places in these days, when money had attained to a power which was almost almighty.

Sir John Hibbert said there was another aspect from which the objects of the Trust could and must be commended. England was a mother country, and we were under an obligation to preserve our ancient monuments for the benefit of our American kinsmen and Colonial brothers. To view historic remains was one of the chief purposes for which Americans came to England. After remarking upon the fact that the London County Council was about to apply for powers to purchase old buildings and works of interest in the Metropolis, Sir John suggested that an attempt should be made to obtain similar powers for all the county councils in England and Wales. It had always appeared to him a lamentable fact that we were very much behind Ireland in this matter. For every one historic building that we cared for in England there were hundreds in Ireland, and until the Government took up the matter, the National Trust would discharge an invaluable function.

Dr. Longstaff said he was afraid that many of our historic buildings and natural beauties were being allowed to perish as a result of our commercial prosperity. On the other hand, there was much that gave room for hopefulness. The landscape gardener had become a necessity of civilisation, parks and squares were now, by the force of public opinion, bound to be laid out with a view to the assimilation of the beauties of the situation. Whatever had been the misdeeds of that much-abused body, the London County Council, it had done much in its parks to cultivate the beautiful. Speaking of the value of the Society's operations, he remarked that he looked forward to the time when the Lake District would be bought and treated as a great national park. He warmly commended the example set by Mr. and Mrs. Richardson Evans in regard to Toy's Hill, remarking that the dedication of spots of natural beauty to the memory of those departed, commended itself to him as altogether worthy of imitation. He could not, for example, conceive what more interesting national monuments could be raised to Lord Tennyson than some of the spots immortalised by him in the Isle of Wight.

The motion for the adoption of the report was then put and carried.

The Earl of Crewe then proposed the reelection of the Council for the ensuing year. The Bishop of Bristol seconded the motion, which was carried.

Mr. A. Waterhouse, R.A., moved a vote of thanks to the Duke of Westminster for throwing open Grosvenor House to the members of the Trust and for presiding.

Sir Robert Hunter seconded, and, alluding to Tintern Abbey, said he feared that unless the Trust secured it, the historic place would fall into the hands of a syndicate, which would "run it" as a show, and vulgarise it in other ways. As to the acquisition of historic places as memorials, he suggested that the house of the late Lord Leighton should be secured, together with the collection of the great painter's studies—which was even of greater interest than a collection of his finished works. Dealing with the growth of public opinion in favour of the preservation of scenes of natural beauty, Sir Robert pointed to the acquisition for the public of Churchyard Bottom Wood, Highgate, as a hopeful sign of the change that is taking place.

The motion was carried, and the Duke of Westminster having briefly replied, the proceedings concluded.

PROPOSED NEW TYNE BRIDGE.—It is proposed to erect a new high level bridge across the Tyne, from plans prepared by Mr. Thos. Hanning, C.E., and Mr. C. M. Marshall, architect, of Newcastle.

## THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring-gardens, Mr. T. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Hackney Vestry 2,190*l.* for electric lighting and other works; the Hampstead Vestry 39,980*l.* for electric lighting; the Islington Vestry 9,600*l.* for street improvements and 23,840*l.* for electric lighting works; the St. Pancras Vestry 16,500*l.* for wood and granite paving and sewer works; the Shoreditch Vestry 11,340*l.* for electric lighting; the Wandsworth District Board 11,600*l.* for paving works; the Camberwell Guardians 9,250*l.* for the erection of a workhouse; and the Whitechapel Guardians 7,500*l.* for alterations at the workhouse.

**New By-Laws.—Street Noises.**—The Council proceeded to consider the new by-laws recommended by the Local Government and Taxation Committee. The following, amongst others, were agreed to:—

**Steam Organs, Shooting Galleries, &c.**—No. 2 (a).—No person shall in any street, or on any land adjoining or near thereto, use or play, or cause to be used or played, any steam organ or other musical instrument worked by mechanical means to the annoyance or disturbance of residents or passengers. (b).—No persons shall in any street, or on any land adjoining or near thereto, keep or manage, or cause to be kept or managed, a shooting gallery, swing boat, roundabout, or any other construction of a like character, so as to cause obstruction or danger to the traffic of any such street.

**Lights to Vehicles.**—No. 4.—Provision is also made as to the lighting of all vehicles driven on a highway between one hour after sunset and one hour before sunrise, this by-law not applying to any carriage required to carry lights under statutory enactment.

**The Works Department: Horton Asylum.—Superstructure.**—The Asylums Committee reported as follows:—"Having previously decided to recommend the Council to carry out this work without the intervention of a contractor, on January 28 last we referred the architect's cube estimate, the bills of quantities priced by the quantity surveyors, and the plans, to the manager of the Works Department for examination and report, pursuant to Standing Order 176. On March 29 last the manager reported, estimating the cost of the work at 284,445*l.* The architect's cube estimate was 281,400*l.* The total of the bills priced by the quantity surveyors was 274,475*l.* 188*sd.*

The manager's estimate being higher than the quantity surveyors' and the architect's, and the Finance Committee not being favourable to the work being carried out by the Works Department, we thereupon obtained tenders by advertisement as follows:—

Kirk & Randall	...	...	£296,575
Henry Lovatt	...	...	297,908
Leslie & Co.	...	...	299,900

The lowest tender is considerably in excess of the price named by the Works manager, which he informs us he is still prepared to carry out the work at. We therefore recommend—That the erection of the superstructure of the Horton Asylum be carried out by the Works Department at the price submitted by the manager, viz., 284,445*l.*

Mr. Hubbard, Chairman of the Committee, varied the recommendation of the Committee to the effect that the work be carried out without the intervention of a contractor, and that the plans and specifications should be referred to the Manager of the Works Department. He pressed that the motion should be either carried or rejected, as every post brought them urgent requests from Boards of Guardians for accommodation for lunatics.

Lord Welby, as Chairman of the Finance Committee, moved that the recommendation should be referred to that Committee for a special report for consideration at the next meeting of the Council.

Mr. Campbell seconded the amendment, pointing out that they had no idea what the Works Department would charge for the work.

Alderman Dickinson hoped there would be no delay. There were some members of the committee who thought a work of this magnitude ought not to be given to a newly-organised department. But after they had advertised for tenders, they only received three, and the Council would not be doing its duty to the ratepayers unless it undertook the work itself.

Mr. Howell J. Williams said the work ought



to go to the Works Department. That department was starved, and had not sufficient work given to it to enable it to employ its plant to the best advantage. The fact that only three contractors had tendered showed that London contractors were indifferent. There were at least twenty contractors in London who could carry out the work. Since the Works Manager's estimate had been made, prices had risen from 5 to 10 per cent. and he thought that when the work was finished the cost would be 5 or 10 per cent. more than the estimate.

Colonel Rotton said the proposal indicated a leap in the dark on the part of the department, and he strongly opposed the Committee's recommendation. He held that they were bound to give the work to contractors as a point of honour, because the Council had asked for tenders, and ought not to withdraw these offers simply because the Works Department said they could do the work for 12,000l. less than the contractors.

Sir John Hutton, though a friend of the Works Department, said he did not think it showed well in the present instance because the Chairman of the Asylums Committee had dropped all reference to the price they proposed to put on the work, namely 284,455l. That seemed like paving the way to an excess on the work. He should like for the amendment, as he thought it would be a mistake to give the work to the Department. The new recommendation left the price quite open.

Mr. John Burns, M.P., said that Mr. Howell Williams' speech was a most significant one. That gentleman had pointed out that it was most significant that only three contractors had tendered. They were told that the price of materials had risen 10 per cent. If that were so, the only thing to be done was to put that amount at the top of the Works Department's estimate. From the ratepayers' point of view, if they wanted the best work done the job must go to the Works Department.

Lord Hardwicke and Sir J. Blundell Maple, M.P., supported the amendment, the latter saying that the Council ought to compensate the contractor who sent in the lowest tender.

Mr. Goodman said the Moderates were now solicitous for the Works Department, for they did not want it to take up a job which would break it down. In that case, the Moderates ought to give the department the job.

Mr. Hubbard replied on the discussion, and Lord Welby's amendment was rejected by 62 votes to 42.

Mr. Bond, M.P., then moved, and Mr. Fletcher seconded an amendment to the effect that the tender of Messrs. Kirk & Randall, which was the lowest, be accepted.

Mr. Beachcroft wished to point out that the decisions of the Council on this matter were of the utmost importance, as they would decide whether the contracting was to be entirely superseded or not.

After further discussion, the amendment was rejected by 60 votes to 37. The recommendation was then adopted on a show of hands by 54 votes to 19.

**Greenwich Tunnel.**—The Bridges Committee reported as follows:—

The Act for the construction of this work was obtained in 1807, the total money powers for all purposes being 75,000l. During the passage of the Bill through Parliament a clause was inserted which made it possible that claims for compensation to persons whose ferry rights and other interests will be affected by the scheme might have to be incurred to an amount of about 30,000l. On February 8 last the Council determined to invite tenders, and on March 22 two tenders were received, from Messrs. Mowlem & Company for 119,732l., and from Messrs. Pearson & Son for 155,000l. The engineer's original estimate, made in 1806, was 65,000l., but, as revised after the quantities were taken out in 1868, now amounts to 83,732l. As we were advised that these amounts exceeded the money powers granted by Parliament, application was made for additional provision in the General Powers Bill. This bill having now passed the committees of both Houses of Parliament, the money may be said to have been granted for the purpose. We have now, in accordance with the instructions of the Council of April 5 last, that we should report upon the question of proceeding with the works of the Greenwich Tunnel, to state that we have given further consideration to the whole question, and we are still strongly of opinion that a footway tunnel should be constructed as a means of connecting Greenwich with the Isle of Dogs. We believe that the work is not of such a character that the Works Department could carry out, and from enquiries of the chief engineer we understand that he is prepared to undertake to construct the

tunnel for the amount of his estimate, on condition that the cost of the necessary plant shall be allowed for, which will approximately increase the expenditure to 100,000l. The Council's standing order which directs that works which are not carried out by a contractor shall be carried out by the Manager of Works, provides for cases where otherwise ordered by the Council. We have come to the conclusion that the Council should carry out this work, and that we should supervise it on the Council's behalf, the Chief Engineer of the Council being responsible to us for the execution of the work. We accordingly recommend that the formation of a footway tunnel to connect Greenwich with Millwall be proceeded with, and that the work be carried out without the intervention of a contractor by the Chief Engineer of the Council, under the supervision of the Bridges Committee.

Dr. Collins thought that the large job just given to the Works Department must be almost enough to satiate the appetite of "direct labour." There would be inconvenience in having two large Works Departments running at once, and he suggested that this report might well stand over.

After a short discussion, the Chairman of the committee, Mr. Ward, agreed to take the report back.

**Rotherhithe Tunnel Borings.**—The same committee recommended, and it was agreed to sanction, an expenditure of 1,400l. on borings in connexion with the formation of a tunnel to connect Rotherhithe and Shadwell.

The Council, having transacted other business, adjourned shortly before eight o'clock.

#### METROPOLITAN ASYLUMS BOARD.

SIR E. H. GALSWORTHY presided on Saturday last at the fortnightly meeting of this Board, at the County Hall, Spring-gardens.

**The New Chief Offices.**—The Local Government Board wrote a second time declining to allow tenders to be obtained for the new Chief Offices on the Embankment without advertising. The letter was referred to committee.

**Advertisements on Hoardings.**—The General Purposes Committee, which had been directed to consider the action of the Works Committee in letting the hoardings round the new Chief Office building on the Thames Embankment for advertisements, recommended that the action should be approved, but that in future the sanction of the Board should be obtained before letting hoardings for advertisements. Mr. W. M. Acworth moved an amendment to refer the matter back. If aesthetic considerations had no place in public business, he said, then they ought to make the new offices the plainest brick box that could be put up, and so save the ratepayers ten or twenty thousand pounds. But if such considerations were proper they had no right, for the sake of a fractional saving, to disfigure the Thames Embankment for two or three years. On a show of hands, the amendment was defeated and the report adopted by a large majority.

**Appointments.**—Messrs. Newman & Newman, of 31, Tooley-street, S.E., were appointed architects of the school about to be erected at Swanley, at a commission of 5 per cent. on the cost of the work, except in the case of buildings which are a repetition of others, upon which the commission will be 2½ per cent. Messrs. A. & C. Harston were instructed to prepare plans and specifications for a laundry receiving-room at the Western Hospital.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Amendment of Consent.

(a) That the resolution of May 31, with regard to the application of Mr. A. O. Collard, on behalf of Captain Bagot and Mr. Chudleigh be rescinded.

(b) That consent be given to the erection of buildings on the north-east side of High-road, Kilburn, to abut also upon Kilburn Priory-road, submitted with the further application of Mr. A. O. Collard, on behalf of Captain J. F. Bagot, M.P., and Mr. A. Chudleigh.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

##### Lines of Frontage.

**Kensington, South.**—An iron and glass covered way at the principal entrance to the De Vere Hotel, Hyde Park-gate (Messrs. Turner & Co. for Mr. J. Croft).—Consent.

**Wandsworth.**—A meeting hall with a projecting porch in Bramblebury-gardens, West Side, Wandsworth Common, at the corner of Melody-road (Mr. C. W. Davies for Mr. F. W. Pitt).—Consent.

**Battersea.**—A two-story house on the west side of Juer-street to flank upon Ethelburga-street (Mr. W. Stewart).—Consent.

**Camberwell, North.**—A porch to the new divisional offices proposed to be erected on the north side of Peckham-road, next No. 81 (Mr. T. J. Bailey for the School Board for London).—Consent.

**Fulham.**—One story additions to the shop front at Twynholm House, Lillie-road (Mr. C. O. King for Messrs. S. and R. W. Black).—Consent.

**Hampstead.**—A house on the eastern side of Minster-road, Edgware-road, to flank upon West-bere-road (Mr. H. T. Bonner for Mr. N. W. Cansick).—Consent.

**Hampstead.**—A two-story bay-window in front of No. 1, Buckland-crescent, Lancaster-road (Messrs. D. and G. Pritchard for Mr. T. Bergmans).—Consent.

**Islington, East.**—A one-story shop upon the forecourt of No. 134, Seven-sisters-road, Holloway (Messrs. Weatherall & Green for Mrs. E. Baynes).—Consent.

**Islington, North.**—An office building commenced to be erected on the south-east side of Elthorne-road, Holloway (Messrs. Douglas Young & Co. for Messrs. Betts & Co.).—Consent.

**Kensington, South.**—An iron and glass pent over the entrance to No. 42, Campden Hill-square (Mr. J. C. McGowan, J.P.).—Consent.

**Kensington, North.**—A two-story bay window at No. 6, Dawson-place, Pembridge-square, to abut upon Chepstow-place (Mr. W. A. Pite for Dr. B. W. Walker).—Consent.

**Levensham.**—A lady chapel, &c., in Comerford-road, Brockley, and of a church, with a projecting porch, on the south side of Howson-road, to abut also upon Comerford-road (Mr. Y. Bolton for the Committee of the proposed Catholic church of St. Mary, Brockley).—Consent.

**Levensham.**—A block of seven houses, with shops, erected on the west side of Springbank-road, northward of Ducrevie-road (Mr. J. Watt).—Consent.

**Paddington, South.**—A porch, with two-story bay windows over, at the proposed Bayswater Synagogue offices, Westbourne-park-crescent, Harrow-road (Messrs. N. S. Joseph, Son & Smith, for the Committee of Management of the synagogue).—Consent.

**Peckham.**—That the application of Mr. J. H. Waterworth for an extension of the period within which the erection of a one-story shop-front at No. 911, Old Kent-road, Camberwell, was required to be commenced, be granted.—Agreed.

**Strand.**—An oriel window at the second and third floor levels in front of the Solferino, Nos. 7 and 8, Rupert-street, St. James's (Messrs. Shoebridge & Rising for Messrs. Poole & Lucas).—Consent.

**Westminster.**—A projecting porch to the Gordon Hospital for Fistula, proposed to be erected on the site of Nos. 126, 128, and 130, Vauxhall Bridge-road, and Nos. 2, 4, and 6, Bloomburg-street (Mr. H. E. Pollard for the Hospital Authorities).—Consent.

**City of London.**—An oriel window and two angle turrets to a proposed building on the south side of Upper Thames-street, between No. 4A and the Fiddle Dock (Mr. C. Reilly for Mr. A. Bird).—Refused.

**Fulham.**—An iron and glass covered-way at the Granville Theatre of Varieties, The Broadway, Waltham Green, to abut also upon Jerdan-place (Mr. F. Matcham for the Granville Theatre Company).—Refused.

**Fulham.**—A shop-front upon part of the forecourt of No. 56, Dawes-road (Mr. W. Connock).—Refused.

**Hackney, Central.**—A one-story addition upon the forecourts of Nos. 1 and 2, Twemlow-terrace, London Fields (Mr. A. Bolton for the Lansdowne New Liberal and Radical Club).—Refused.

**Paikham.**—Three-story shops upon the forecourts of Nos. 747A, 747, 749, and 751, Old Kent-road (Mr. E. Crose for Messrs. W. Cooper, Limited).—Refused.

**St. George, Hanover-square.**—Bay and oriel windows at No. 23, Eaton-square, to abut also upon Eccleston-street (Messrs. G. Trollope & Sons for the Hon. C. N. Lawrence).—Refused.

**St. George, Hanover-square.**—An iron and glass hood erected at the entrance to the Wilton Hotel, No. 32, Wilton-road (Messrs. F. and H. F. Higgs).—Refused.

**Strand.**—Two oriel windows in front of a building known as Nos. 33 and 34, Savile-row, St. James's (Messrs. G. Bartlett & Sons for Mr. C. H. Newman).—Refused.

**Strand.**—An iron and glass shelter in front of the Tudor Hotel, Oxford-street, at the corner of Dean-street (Mr. P. E. Filditch for Mr. O. Owen).—Refused.

##### Width of Way.

**Lincoln.**—A building at No. 85, Gill-street (Messrs. J. & S. F. Clarkson for Messrs. C. Fardell & Son).—Consent.

**Lincoln.**—Two warehouses on the site of



No. 75, Wapping-wall (Mr. E. A. B. Crockett for Messrs. Anderson, Weber & Smith).—Consent.

**Norwood.**—A building on the west side of a roadway, reading out of Knight's Hill-road at the rear of the premises (Messrs. Bowyer & Co. for Messrs. Trustlove & Bray).—Consent.

**Poplar.**—Warehouse at Concordia Wharf, on the east side of Coldharbour-lane, Blackwall (Mr. J. M. Knight for Mr. Tindal).—Consent.

**St. George-in-the-East.**—Two-story cottages and one-story sheds on the northern side of Cinnamon-street, to abut upon Hilliards-court and Clegg-street (Messrs. Clifton, Son & Hope for Mr. Lafone).—Consent.

**St. Pancras, East.**—Two-story building on the southern side of Jeffrey's-place, Jeffrey's-street, Camden-town (Mr. R. Midworth for Mr. C. S. Arkell).—Consent.

**Woolwich.**—Two buildings on the east side of Hardens-mare-way, Lower Woolwich-road, at less than the prescribed distance from the centre of the road (Messrs. Siemens Brothers & Co., Limited).—Refused.

#### Space at Rear.

**Littlemore.**—Re-erection of the "Waterman's Arms" public-house, No. 92, High-street, Wapping, at the corner of Wapping-old-stairs, with an open space at the rear of the new building (Mr. J. G. Needham for Mr. J. Prior).—Consent.

**Greenwich.**—A modification of the provisions of Section 41 of the London Building Act, 1894, with regard to open spaces about buildings, so far as relates to the proposed erection of a dwelling-house, with shop, on the north side of Trafalgar-road and eastward of Christ church, with an open space at the rear (Mr. A. Roberts for Mr. W. Mills).—Consent.

**St. George, Hanover-square.**—A one-story addition on the open space at the rear of No. 103, Eaton-square, in the rear of the premises (Mr. G. G. Trollope & Sons for Mr. C. Czarnikow).—Consent.

**St. George, Hanover-square.**—A building upon part of the open space at the rear of a dwelling-house on the north-east side of Eccleston-street, Pimlico, at the corner of Eccleston-street East (Mr. Z. King for Messrs. H. Young & Co.).—Consent.

**Strand.**—The rebuilding of No. 50, Rupert-street, Coventry-street, St. James's with an open space at the rear (Messrs. Chambers & Dewes).—Consent.

**Wandsworth.**—A row of stables on the north side of a proposed mews to lead out of Heathview-gardens, Portsmouth-road, Putney Heath, such stables to abut at the rear upon an open space (Mr. P. E. Pilditch).—Consent.

**Brixton.**—A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of two blocks of four-story flats, with shops on the ground floor, on the north side of Landor-road, Stockwell, with an irregular space at the rear of the easternmost block and with portions of both blocks within the diagonal line as directed to be drawn (Mr. J. E. Lamerton).—Refused.

#### Deviation from Certified Plans.

**Holborn.**—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of two dwelling-houses, adapted to be inhabited by persons of the working class, on the site of Nos. 5, 6, 7, and 8, Dove-court, Leather-lane (Mr. G. Judge for the Trustees of the will of the late Mrs. H. M. Burton).—Refused.

#### Line of Fronts and Width of Way.

**Hackney, South.**—A gas-meter house and an open iron covered way at the Hackney Union Infirmary, to abut respectively upon Sidney-road and High-street, Homerton (Mr. W. A. Finch for the Guardians of the Hackney Union).—Consent.

**Norwood.**—A public library building on the site of Nos. 39 and 41, Westow-hill, Upper Norwood, to abut upon Beardsell-street (Mr. E. Haslehurst for the Joint Committee of the Vestry of Lambeth and the Corporation of Croydon).—Consent.

**Southwark, West.**—That the application of Messrs. F. S. Brereton & Son on behalf of the Trustees of Marshall's Charity, for an extension of the periods within which the erection of twelve houses on the western side of Webber-row, St. George-the-Martyr, was required to be commenced and completed, be granted.—Consent.

**Marylebone, East.**—An iron and glass covered-way in front of the Queen's Hall, Langham-place, at the corner of Ridinghouse-street (Messrs. Leggatt, Rubinstein, & Co., for Mr. R. Newman).—Refused.

**St. James's, South.**—A theatre on the site of Nos. 37, 39, 41, and 43, Euston-road and a building at the rear, such theatre to abut also upon Tonbridge-street (Messrs. Wyson & Long).—Refused.

#### Line of Fronts and Space at Rear.

**Hackney, North.**—That the consent of the Council be not given to the erection of a one-story addition, with bay window over, upon the roof of the fore-court of No. 85, Stoke Newington-road, to abut upon Prince George-road, and that the Council, in the exercise of its powers under Section 41 of the London Building Act, 1894, do not permit the covering in of the court-yards to that house and the adjoining building westward in Prince George-road, Stoke Newington (Mr. T. Fryor).—Agreed.

#### Formation of Streets.

**City of London.**—That an order be issued to Messrs. Davis & Emanuel, sanctioning the formation or laying out of a new street for carriage traffic, between Fenchurch-street and Crutched-friars (for Mr. J. Dixon). That the name Lloyd's-avenue be approved for the new street.—Agreed.

**Wandsworth.**—That an order be issued to Mr. P. E. Pilditch, sanctioning the formation or laying out of a mews for carriage traffic, with one entrance on the west side of Heathview-gardens, Portsmouth-road, Putney Heath.—Agreed.

**Clapham.**—That an order be issued to Messrs. G. A. Wilkinson & Son, sanctioning the formation or laying out of new streets, for carriage traffic, on the Hyde Farm estate, Balham, adjoining Tooling-Bec Common (for the authorities of Emmanuel College, Cambridge, and Mr. P. Dashwood). That the names Stackfield-road, Burnbury-road, Midmoor-road, Scholars-road, Pentney-road, Haverhill-road, Emmanuel-road, Nonesuch-road, Telferscot-road and Cambray-road, be approved for the new streets.—Agreed.

**Woolwich.**—That an order be issued to Mr. A. Dwyer, refusing to sanction the formation or laying out, for carriage traffic, of new streets, 40 ft. wide, on an estate on the southern-side of Swingate-lane, Plumstead Common, and the widening of a portion of that lane (for Mr. H. N. Grenside).—Agreed.

**Deptford.**—That an order be issued to Mr. A. H. Kersey and Mr. H. Stock, refusing to sanction the formation or laying out, for carriage traffic, of new streets on the Hogarth estate and the Haberdashers' Company's estate near Brockley Station (for Mr. R. Kersey and the Worshipful Company of Haberdashers).—Agreed.

**Deptford.**—That an order be issued to Mr. F. Oxley, refusing to sanction the formation or laying out, for carriage traffic, of a new street to lead out of the north side of Nymbehead-street, Woodstock-road, and the formation of an extension of the footway next the London, Brighton, and South Coast Railway.—Agreed.

**Norwood.**—That an order be issued to Messrs. G. Trollope & Sons, refusing to sanction the formation or laying out, for carriage traffic, of new streets on St. Julian's Park estate, Knight's Hill-road, West Norwood (for the executors of the late Mr. G. F. Trollope).—Agreed.

**Woolwich.**—That an order be issued to Mr. A. Dwyer, refusing to sanction the formation or laying out for carriage traffic of new streets to lead out of Swingate-lane and Timbercroft-lane, and the widening of part of the latter lane (for the Rev. J. McAllister).—Agreed.

#### Means of Escape at Top of High Buildings.

**Newington, West.**—That the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, do grant a certificate to Mr. H. B. Measures, on behalf of Rowton Houses, Limited, in respect of the means of escape in case of fire provided for the persons dwelling or employed on the top floor of the front block of Rowton House, Churchyard-row, Newington-butts.—Agreed.

**St. George, Hanover-square.**—That Mr. G. D. Martin be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of a block of residential flats, with shops on the ground floor, on the west side of Regent-street, on the site of Hanover Chapel (for Mr. T. Brooke-Hitchings).—Agreed.

**Strand.**—That Mr. G. D. Martin be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is not prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth floor of Marlborough Hotel, Bury-street, at the corner of Ryder-street, St. James' (for Mr. J. Ramsay).—Agreed.

*Recommendations marked † are contrary to the views of the Local Authority.*

#### COMPETITIONS.

**PUBLIC HALL, PITLOCHRY, N.B.**—On the 12th inst. a final adjudication on the sixteen competitive designs lodged for the proposed Public Hall was made. In the afternoon Professor Charles Gourlay, of the Technical College, Glasgow, who had been appointed assessor, inspected the site of the proposed hall, and afterwards inspected the designs submitted. The Committee had selected a short list of three, and Professor Gourlay selected one other that he considered worthy of being placed in the list. In regard to the short list, he considered the design sent in bearing the motto "White Cross" to be the best. The estimated cost was 2,360l. 15s., and Professor Gourlay was of opinion that the building could be erected for the sum stated. The other designs were placed as follows:—2. "Simplicity," 3. "Atholl." The Committee agreed to accept the recommendation of the assessor. On open-

ing the envelope containing the respective mottoes, it was found that the author of the successful design was Mr. Alexander Ness, 143, Nethergate, Dundee. It was accordingly agreed to accept this design for the proposed hall, provided the contractors' estimates show that it can be erected for the sum stated. The authors of the second and third designs were found to be Messrs. John Menzies, Pitlochry, and John Leonard, Pitlochry, respectively.

**HOSPITAL, BROMLEY, KENT.**—The assessor in the competition for the Phillips Memorial Homeopathic Hospital and Dispensary, Bromley, was Mr. R. Norman Shaw, R.A., who has placed first the design marked "Sol" (Major). This was sent in by Messrs. Gibson & Russell, 14, Gray's Inn-square, W.C.

#### ARCHÆOLOGICAL SOCIETIES.

**BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.**—The annual excursion of this Society was made to London this year and took place on Monday, the 11th inst., when the members and friends arrived at Paddington, and assembled at the Brewers' Hall, in the City. The report of the Council for the past year was submitted and approved, and officers were chosen for the ensuing year. Sir John Dorington was elected President, and delivered an address. Mr. G. H. Birch, of the Soane Museum, read a paper on "London Churches built by Sir Christopher Wren"; Mr. G. Welch, of the Guildhall Library, described the "City Guilds"; and Mr. Kennedy-Shipton narrated the story of "Sir Richard Whittington," who was a native of Gloucestershire. The whole party then adjourned to the Mansion House, where they met the members of the London and Middlesex Archaeological Society (who were also invited) and were received by the Lord Mayor and Lady Mayoress, who bid them a hearty welcome. After perambulating the various rooms of the Mansion House and inspecting the many objects of interest and art contained in it and the Egyptian Hall, the party proceeded to the Guildhall. Here they were met by Mr. W. Cooper (Chairman of the Library Committee); Sir Stuart Knill; Mr. Welch, Librarian; and Mr. J. K. Baddeley, The Fine Art Gallery, with its loan of French pictures, the museum, crypt, library, and the Guildhall itself, the Council-chamber and several rooms were all inspected. On Tuesday, visits were paid to the churches of St. Bartholomew the Great, and St. John's, Clerkenwell, and the Charterhouse; also to Hampton Court Palace. On Wednesday, the excursionists visited Mercers' Hall; St. Olave's Church, Hart-street; St. Saviour's, Southwark; the Tower of London; and Lambeth Palace. On Thursday, the programme included St. Helen's, Bishopsgate; Crosby Hall; St. Andrew Undershaft; St. Mary Abchurch; St. Stephen's, Walbrook; the Armourers' and Braziers' Hall, the Barbers' Hall, and the Soane Museum. Friday was reserved for Westminster Hall and Abbey and the Temple. On Saturday the visit to London ended, and en route for the West, the camp at Silchester was explored.

**SURREY ARCHÆOLOGICAL SOCIETY.**—The annual excursion of this Society has been announced to take place on Thursday, the 28th inst., and will be made to Farnham, Moor Park, and Waverley Abbey. The members and friends are to assemble at Farnham Railway Station at 12 o'clock (noon), under the presidency of Viscount Midleton, Lord Lieutenant of Surrey, whence a drive will be made to Moor Park. Here a paper on "Moor Park and its Associations" will be read by the Rev. W. H. F. Edge, M.A., Vicar of Tilford. A walk will then be made by way of "Stella's Cottage" to Mother Ludlam's Cave. At Whitmead a collection of flint implements, Roman coins, &c., found in the neighbourhood by Mr. George Gibbons, will be exhibited, and an inspection will be made of the remains of ancient entrenchments in the grounds. At 3 p.m. the company is announced to leave Whitmead, driving, by Crooksbury, to Waverley Abbey. Here the ruins and site of the Abbey will be described by Mr. W. H. St. John Hope, M.A. Further particulars can be obtained on application to Mr. Montague S. Giuseppe, Hon. Secretary. The last time this Society visited Farnham, Moor Park, and Waverley Abbey, was July 30, 1880, and the proceedings on that occasion will be found recorded in the eighth volume of the Society's Transactions.



## Illustrations.

### SKETCHES OF OLD HAMPSHIRE.

SO many changes are in progress or impending in Hampshire, that these sketches of old buildings which are either gone or are only too likely to go will probably be of interest to lovers of Hampshire, and may have a historic value hereafter. The illustrations are all reproduced from washed drawings in Indian Ink by Mr. P. L. Forbes, an artist, living in Hampshire, and known to many as Hon. Secretary of the Hampshire Art Society.

The following is Mr. Forbes's description of the drawings:—

**Hunt Cottage.**—The cottage on the left with the verandah is the one in which Leigh Hunt lived, where he was visited by Byron, Shelley, and other men of note; the one in the centre is Woodbine Cottage, which, it is said, Hunt also occupied in addition, as his family increased. In an old water-colour drawing by John Varley, three wooden and tile-roofed cottages are shown standing alone; one is now gone and the other two are jammed in among modern monstrosities.

**Constitutional Club.**—This quaint and picturesque pile was built on the site of Romney's studio, about two or three years after the death of the great painter in the beginning of the century. Many famous men have been entertained here.

**Back of Houses, Grove-place.**—Grove-place, which runs between New End and Christ Church-road, is an extremely sad sight to the lover of the picturesque. "Once a row of fashionable Early Georgian houses, one of which was, I believe, visited by George IV., it is now a row of ruins, every window is broken, except in the house at each end, the leases of which have not yet quite expired. The house at the Christ Church-road end has a fine old wooden doorway which is now almost hidden from view by boarding.

**New End.**—Many of the houses in New End, now inhabited altogether by the working class, have once been the abodes of the wealthy, as the doorways and interiors still remaining in a few of them show.

**Church-vault, looking East.**—Alas! what can I say about this most unique old Georgian street? Of all streets in or around London this was the one to take us back in its entirety to the early Georgian period. Many (all that I have been in) of the houses are beautifully panelled, and have fine staircases with turned balusters and carved ends to the steps. The doorways are pilastered, and have graceful canopies. The projecting bay in the drawing is, I believe, unique of its kind; but the builder is at work, and the houses beyond the bay have just been pulled down, many fine old trees levelled to the ground, and flats, those modern blots in the landscape, or housescape, are being run up! Nor is the destruction stopping here. On the other side of the street, close to the old church, a board has just been put up signifying that down are to come two or three houses, and up are to rise, like hideous barracks *more flats*. Can nothing be done to save these? It is feared also that the adjacent houses will not stand when these are pulled down, and it will not be surprising if, in a few years time, not one of the fine old houses will be left. Can nothing be done to preserve to us the rest of this quaint street?

**Christ Church Steps.**—These steps lead from New End, past the church to Cannon-place. On the right hand side as one goes up there stands a curious little building called the Ebenezer Chapel. It was put up in the beginning of the century, but here, as everywhere else, the ground, and all on it is to be sold for building purposes, including the house on the right of the drawing and the row of houses next it.

**Stratley Place.**—One of the great charms of the old village of Hampshire (now a town) is the steps in different parts leading from one level to another. There are six sets of steps in different parts that I remember at present. Those in the drawing are one of the most picturesque, and lead up into a very narrow alley of quaint old houses, and on into Heath-street; but a hole is knocked in the wall on the right and the workmen are busy.

**Cherry Tree House.**—This fine substantial old house—or, rather, houses, for the block contained two houses—used, till last year, to stand at the junction of New End with Heath-street. The little shop with the shutters up, signifying the beginning of the end, was occupied by a

blind chemist for over forty years. It got its name from a fine old cherry tree which stood in the garden. Last year it was pulled down to make room for immense additions to the workhouse, which are now completed. I cannot find that any one of note lived here.

In conclusion, may I say that Hampshire proper may be, and is, far better off now in the way of sanitation and healthy houses? But as to its beauty! Alas! it is fading fast away, and in a short time it will be but a monotonous continuation of Camden Town.

P. L. FORBES.

### THE SIR JOHN CASS TECHNICAL INSTITUTE.

THE Sir John Cass Technical Institute is the latest of the series of polytechnics to be erected to supply the needs of technical education in London. A limited competition was held in the autumn of last year, the Governors of the Foundation having appointed Professor Aitchison to act as assessor in conjunction with Sir Philip Magnus and Dr. Garnett, of the Technical Education Board.

The designs were submitted without motto or other distinguishing mark, and each of the competitors received a sum of fifty guineas for his plan. Five gentlemen were selected to compete, mainly from those who had previously erected similar buildings.

The foundation, which dates back to the year 1710, has previously existed in the form of a school for 110 boys and 100 girls, for which accommodation will be provided in the new building. The site is situated upon the east side of Jewry-street, Aldgate, E.C., and has also frontages to George-street and Little George-street.

The basement provides for the various technical workshops, the physics laboratory, the lower part of the lecture theatre, and the necessary accommodation for the heating and electric light apparatus.

Upon the ground floor is the large hall, which will be let to the public for concerts and similar entertainments. The remainder of this floor provides the rooms for the governors, the secretary, the inquiry office, and the upper part of the lecture theatre.

The first floor comprises the upper part of the large hall and the class rooms for the accommodation of the school, all of which will be used for the purposes of the Institute. The second and third floors provide the social and refreshment rooms, the library, rooms for artistic crafts, the art school, chemical laboratory, &c., and also a laundry, cookery school, and dressmaking and tailors' cutting rooms.

The top floor consists of a large gymnasium, 74 ft. by 36 ft., and two playgrounds for the use of the school children.

The building will be fireproof throughout, and is estimated to cost 30,000. A preliminary contract has been entered into for the foundations, which are now practically completed, the contractors being Messrs. Kilby and Gayford.

The perspective view is that submitted with the competition plans, and is taken from the point of site fixed in the conditions.

The building will be faced with red bricks and possibly Portland stone. A. W. COOKEY.

### OLD MALHOUSE, &c., STREATLEY, BERKS., CONVERTED INTO VILLAGE CLUB AND RESIDENCE.

THESE old buildings consisted of a malthouse and what was once a tolerably good house, part of which has existed, in all probability, for some 250 years or more. Latterly the house has been used for a laundry, and the view which is now hung in the Royal Academy represents the buildings as altered and restored.

The club consists of a room nearly 70 ft. long and 24 ft. wide, capable of subdivision into three rooms by sliding screens. It has also a small gallery at one end, and conveniences for ladies and gentlemen, as well as a caretaker's cottage at the other end.

It is finished internally with panelling round the walls and wood-block floor, and is warmed and ventilated by heating and ventilating apparatus, as well as an open fireplace.

The house has been restored with a view of keeping as much of the old character of the building as possible, and the situation in the village street, close to Streatley Bridge and the Parish Church, is a very pleasant one.

There has not been any general carried out for the work, which has been mainly carried out by Mr. Smallbone, of Streatley, for Mr. G. Her-

bert Morrell, M.P., the sanitary work being in the hands of Messrs. Best & Sons, of Oxford and London, and the warming and ventilation in those of Messrs. Haden & Sons, of Trowbridge and London.

Mr. W. Ravenscroft, F.S.A., of Reading, is the architect.

### NEW HOUSE, GORING-ON-THAMES.

THIS house, now in course of erection for Mr. Ernest Michelmore, of Goring, is placed on rising ground a short distance from the River Thames, and commands a very fine view of the Stratley Hills on the opposite side of the river.

It is designed with the purpose of making it a simple and unostentatious but comfortable house, and the general arrangements will be seen from the plan which accompanies the view. It will be an inexpensive house, but substantially built, the materials being chiefly red brick, with rough cast in the upper portion of the exterior, and brown tiles. The accommodation above the ground floor story will consist of nine bed-rooms, dressing-room, bathroom, water-closet, linen closet, &c.

The work has been placed in the hands of Mr. T. Higgs, builder, Goring, without competition. Mr. W. Ravenscroft, F.S.A., of Reading, is the architect.

### THE "OLD WHITE HOUSE," OXFORD.

THIS is a new building and has been recently erected in front of the original one, which is a rather interesting example of the sixteenth century, though now much mutilated. The premises are used as a small inn, and the new building was rendered necessary by the insanitary state of the old one and its distance from the road.

The lower portions of the walls are in rubble masonry with Doubling stone dressings, and the upper story is finished in cement. The roofs are covered with hand-made red tiles.

HENRY T. HARE.

### CHEQUER'S MEAD, NORTHAW.

THIS house is built with hollow walls, bonded with Jennings' bonding bricks. The first floor and attic floor are tile hung, Broseley tiles, Sovereign brand, being used throughout. The bricks used are Fletton. The cottage and stables are of like construction. The drainage disposal is partly in a depositing tank, which is frequently emptied, and the overflow is led into open jointed agricultural pipes, laid fan-wise at about 9 in. below the surface of the ground, on a slope of old permanent pasture, and surrounded by layers of burnt ballast. The architect was Mr. John Richmond, and the builders Messrs. Ekins & Favley, of Hertford.

### BOOKS RECEIVED.

DIE BAUKUNST DER RENAISSANCE IN FRANKREICH. Von Dr. Heinrich Baron von Geymüller (London: Aug. Siegle).

NON-FLAMMABLE WOOD (The British Non-Flammable Wood Co.).

MECHANICAL ENGINEER'S OFFICE COMPANION. By R. Edwards (Crosby, Lockwood & Son).

THE REMOVAL AND DISPOSAL OF TOWN REFUSE. By W. H. Maxwell (The Sanitary Publishing Co., Ltd.).

JOURNAL OF THE SANITARY INSTITUTE. (Published quarterly: Parkes Museum, Margaret-street, W.)

**PREHISTORIC REMAINS AT TODMORDEN.**—Three cinerary urns found recently on the hill above Todmorden were opened on the 13th inst. at a meeting held for the purpose in the Co-operative Hall, Todmorden. The urns were found in the centre of an earth circle some thirty yards in diameter. Two or three hundred people, including representatives of various societies, attended the meeting to see the urns opened. The urns are of burnt clay. The largest of the three is about 18 in. high, and perhaps a foot in diameter at its widest part. Round the top there is some slight ornamentation of a "fish-bone" character. It was soon found that the smaller vessels contained nothing in particular, and the whole interest became centred on the large urn. Near the surface, and mixed with soil and charcoal, were small pieces of bone and earthenware, and the urn had been nearly emptied before anything more distinctive was found. But at the bottom the explorers came upon a small cup containing a bronze spear-head, a bronze pin, and a small quantity of bones which had been submitted to the action of fire. The cup rested in a socket, and was ornamented in the same style as the urn.





HUNT COTTAGE, VALE OF HAMSTEAD



CONSTITUTIONAL HILL



ROW OF HOUSES, ABOVE PLACE



NEW STREET



CHURCH LANE, ABOVE PLACE



CHRIST CHURCH STEPS



NEW STREET PLACE



CHURCH LANE, ABOVE PLACE

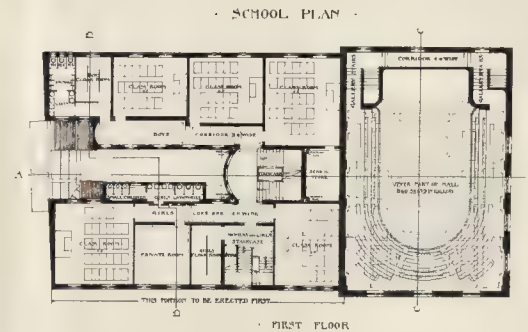
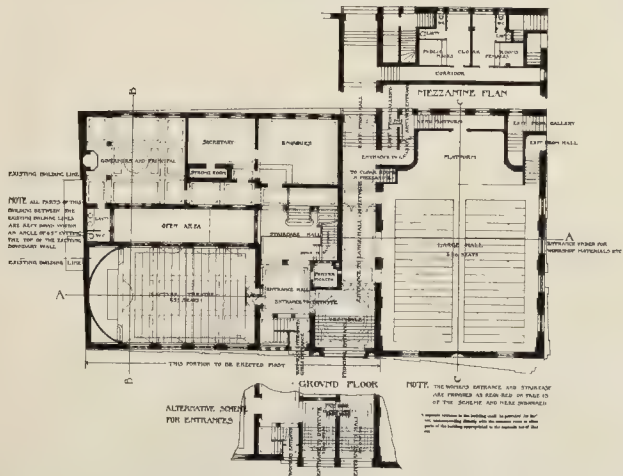
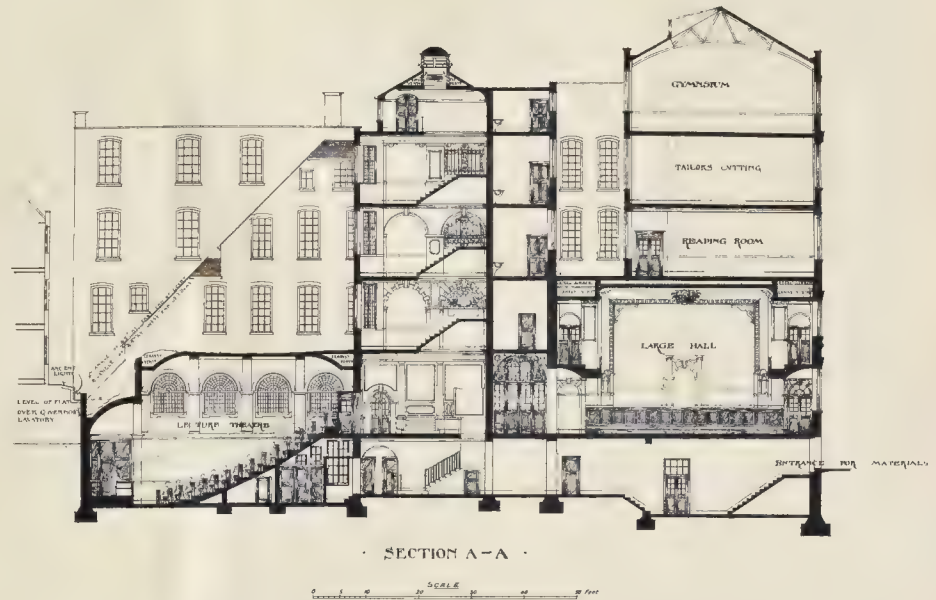






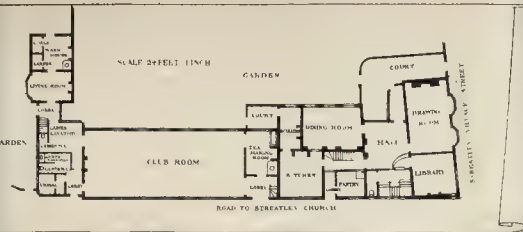
THE SIR JOHN CASS TECHNICAL INSTITUTE.

Mr Arthur W. Cooksey, A.R.I.B.A. Architect.

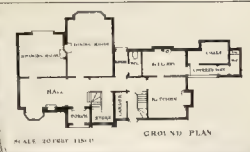








OLD MALTHOUSE, &c., CONVERTED INTO CLUB AND RESIDENCE STREATLEY MR W RAVENSCROFT F.R.I.B.A., ARCHITECT

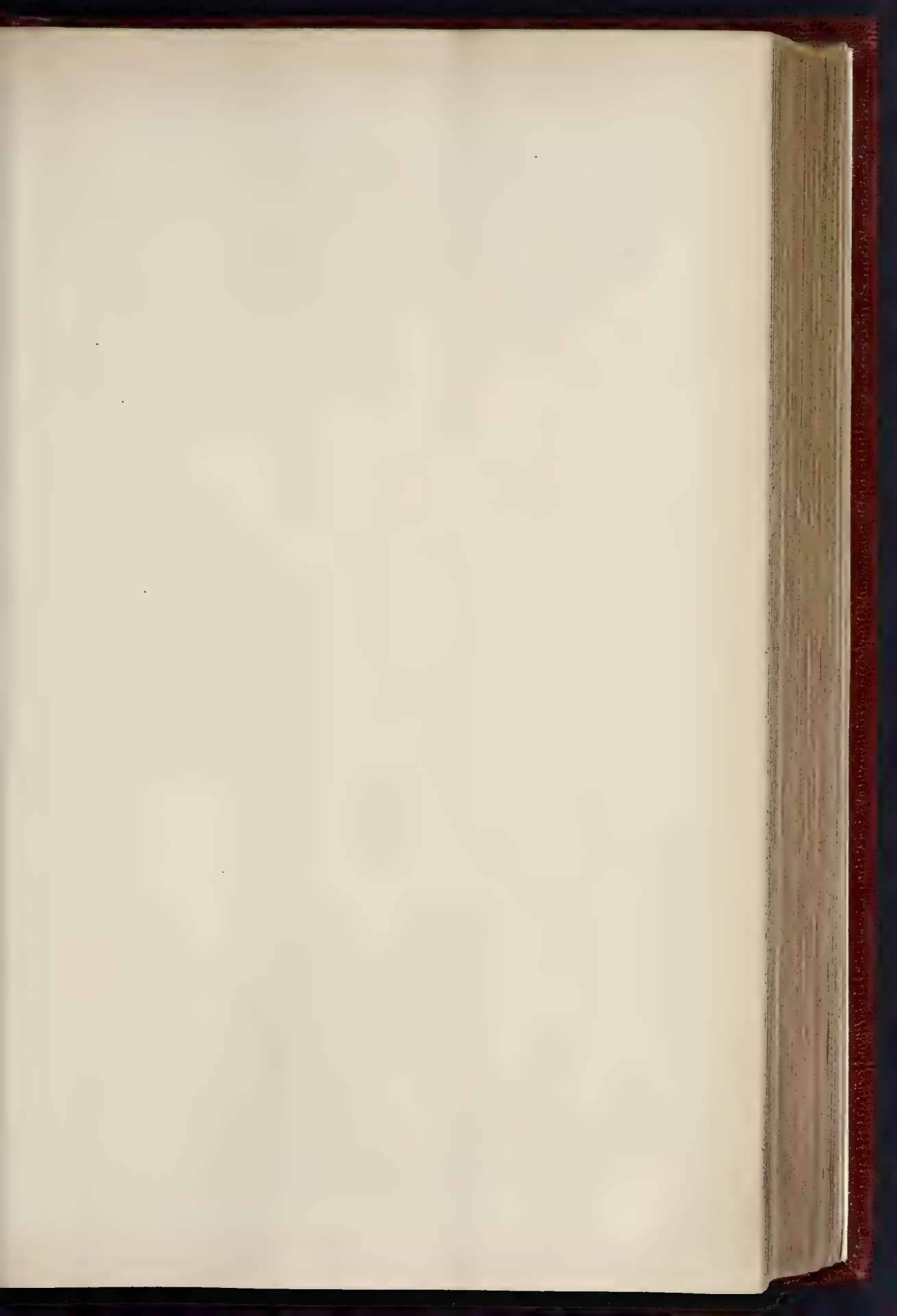


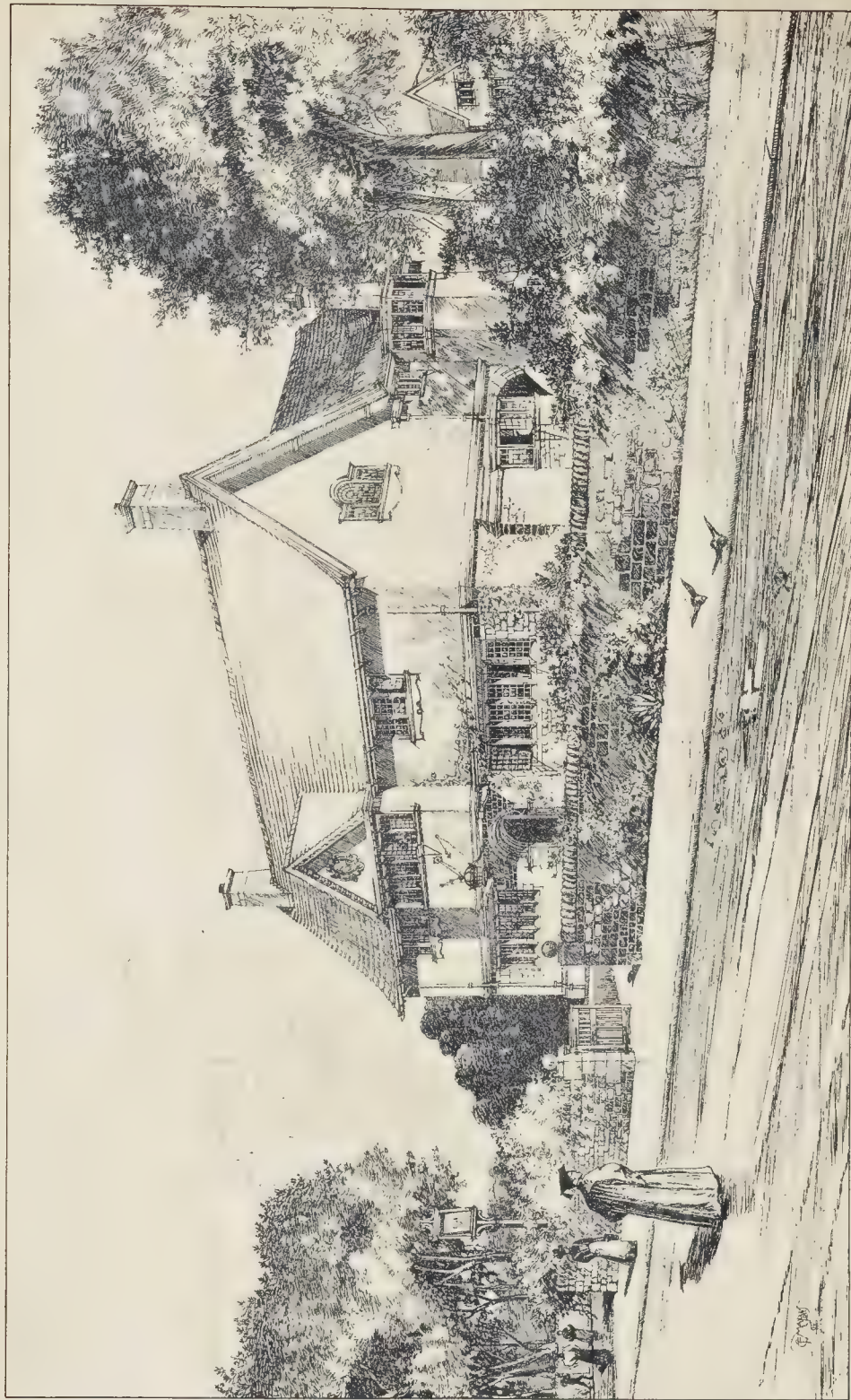
NEW HOUSE GORING-ON THAMES MR W RAVENSCROFT F.R.I.B.A., ARCHITECT

DESIGNED BY MR W RAVENSCROFT F.R.I.B.A. EAST HARDING STREET, LONDON





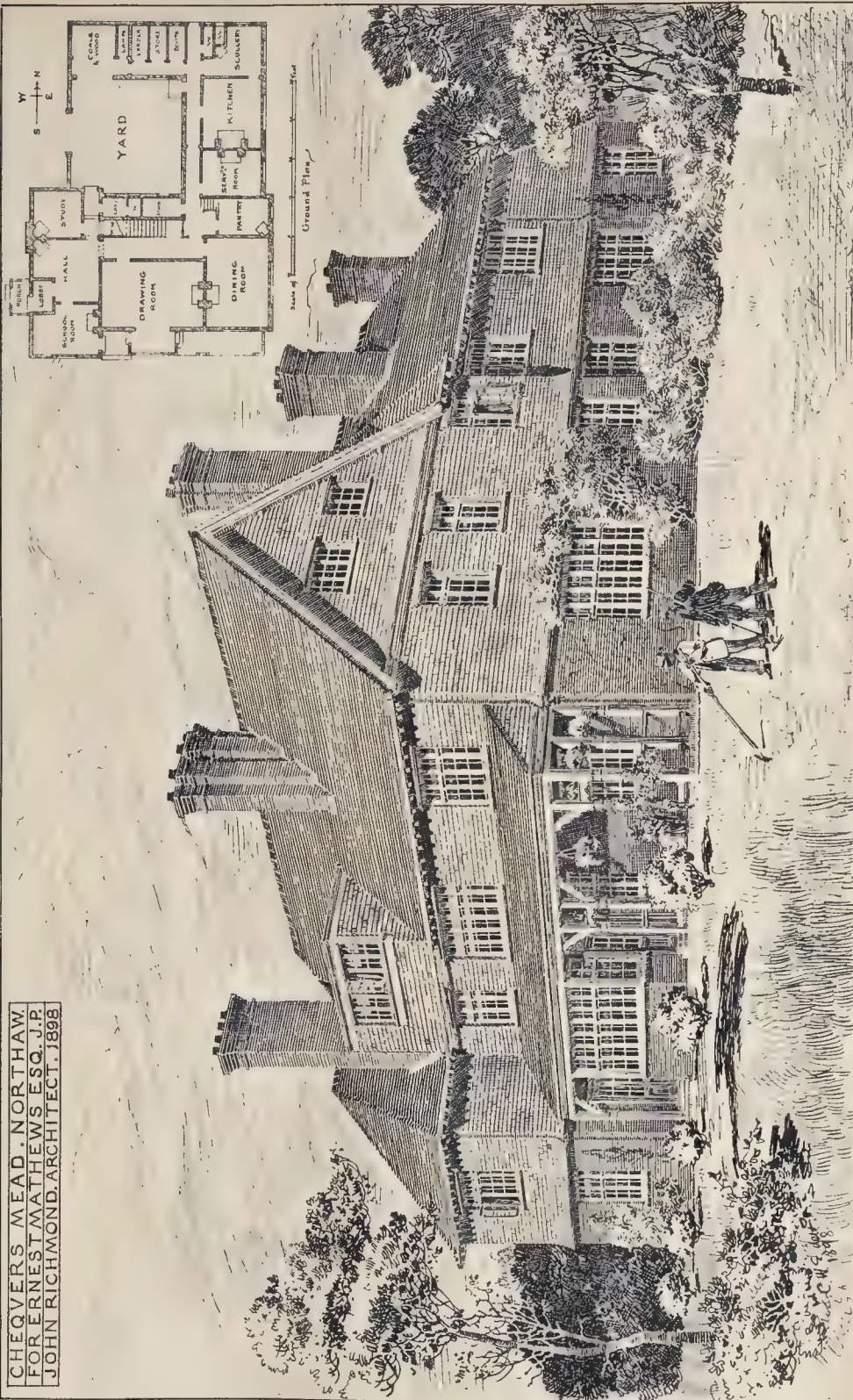




THE "OLD WHITE HOUSE," OXFORD. MR. H. T. HARE, A.R.I.B.A., ARCHITECT.



CHEQVERS MEAD, NORTHAW,  
 FOR ERNEST MATHEWS ESQ. J.P.  
 JOHN RICHMOND, ARCHT. 1898



THE ARCHT. JOHN RICHMOND, 15, GERRARD STREET, LONDON, W.





## The Student's Column.

### SOUND, LIGHT, AND HEAT.—IV.

SOUND: PROPAGATION (continued).

**W**E have not yet explained the actual way in which sound is propagated in air, though we have given some details in regard to the intensity of sound, and how that may be transmitted, impeded, and, in some cases, strengthened. From what has already been said, it will be gathered that when sound is produced, the air all round the sonorous body (as far as possible) is disturbed. This disturbance is translated into waves, which are spherical when not confined or interfered with, and the centres of the spheres are the molecules of the vibrating body producing the sound. As a molecule in such a body moves rapidly backwards and forwards, it follows that the air round it is as rapidly alternately compressed and expanded. The compressed air is, of course, condensed, but the condensation does not extend at once far away from the disturbing molecule; the result is that a spherical portion of condensed air exists round that molecule, and this portion is known, technically, as the "condensed wave." By the time the first layer of this wave comes to rest, the outermost layer communicates the motion to the first layer of the next succeeding (second) wave, and so on. As these waves are spherical, it follows that the motion is the more spread out radially as it recedes from the disturbing molecule. The condensed wave advances by each of its parts having successively the same degree of condensation and velocity, within certain limits.

As the advance of the molecule in vibration produces a condensed wave in front of it, so, as it recedes in the vibration, does it lead to expansion of the air next to it in the same position—by the withdrawal of the force, in fact, which produced the compression and accompanying condensation. The portion of air thus expanded, limited as before, is known as the "expanded wave." And the two movements collectively produce an "undulation," so that an undulation in this sense is composed of a condensed and an expanded wave. The length of an undulation is the distance traversed by the disturbed air during a complete vibration of the sonorous body; and that distance will be dependent on the rapidity of the vibration, provided always there be no disturbing element such as was foreshadowed in our last article relating to intensity of sound. In that case, however, the disturber is frequently capable of diverting or directing the sound only, and not of absorbing it, and acts as a controller and not as a vehicle of propagation. This last observation, however, does not apply always to intensity as dependent on density of the air, which, as we have already seen, is a matter of degree.

In speaking of this hypothesis, Atkinson (*Op. cit.* p. 207) remarks that it is these spherical waves, alternately condensed and expanded, which, in being propagated, transmit sound. If many points are disturbed at the same time, a system of waves is produced around each point. But all these waves are transmitted one through the other without modifying either their lengths or their velocities. Sometimes condensed or expanded waves coincide with others of the same nature to produce an effect equal to their sum; sometimes they meet and produce an effect equal to their difference.

#### THE STRENGTHENING OF SOUND.

It is a matter of common knowledge amongst students of architecture that in ancient times resonant brass vessels were placed in convenient positions in theatres to strengthen the voices of the performers; Vitruvius has left us some account of that. The principle involved in such a case may be demonstrated by the following experiment devised by Savart. The apparatus employed consists of a hemispherical brass vessel and a hollow cardboard cylinder closed at one end. The brass vessel is mounted preferably with the rim uppermost and horizontal; the cardboard cylinder is so arranged on an upright that it can be inclined at any angle, with its open end towards the rim of the brass vessel, and dipping away from the latter. The cylinder, moreover, can be placed near to or away from the brass vessel, its upright being fixed to a rod sliding in and out for that purpose. The apparatus being set in order, the brass vessel is made to vibrate by means of a violin bow which is smartly scraped against

the outer rim. A sound is immediately emitted and may be intensified by repeated continuous movements of the bow. Note the strength of the sound. If, now, we adjust the hollow cylinder, we shall notice that the sound is very considerably fortified when the cylinder is placed in certain positions, but, as these positions are varied, the strengthening becomes less marked. By sliding the cylinder away from the brass vessel we have only the normal tone of the latter, the sound becoming weaker as the former is removed. There can be no question in such an instance that the strengthening is due to the vibration of the air inside the cylinder, actuated by the latter, which vibrates in unison with the hemispherical brass vessel. In order that the two shall vibrate in unison, the cylinder is adjusted to a certain depth.

It is obvious that before such an apparatus, or a modification of it, can be utilised to strengthen the sound of the human voice, except in a very general way, there must be several of the cylinders adjusted to different depths to suit different tones, and the speaker or singer must be placed in certain definite positions with reference to the apparatus. These conditions must of necessity considerably restrict the movements of the performer, and are a great drawback to the general use of this method of strengthening sound. At the same time, it is utilised to a certain extent in theatres and elsewhere, principally, however, as a special performance, which shows off the principle by producing some startling effects, and not as a matter of general utility. The utilisation of the sounding board and the principles involved in that direction have doubtless also had something to do with the comparative neglect of the practical applications of those inculcated by Savart's experiment—at any rate as applied to buildings.

#### THE TRANSMISSION OF SOUND IN TUBES.

Cylindrical, straight, smooth-bored tubes are excellent conductors of sound, and the law that the intensity of sound decreases in proportion to the square of the distance does not apply to tubes, as will be readily understood on considering the phenomena of the speaking tube. The sound waves are not propagated in the form of increasing concentric spheres, and sound can be transmitted with but little alteration either in intensity or quality for long distances through pipes of small bore; in those of large diameter it rapidly becomes weakened. Regnault found, however, that in straight cylindrical tubes the intensity of sound gradually diminishes with the distance, and the rate is nearly in proportion to the diameter of the tube.

"He reproduced sound waves of equal strength by means of a small pistol charged with a gramme of powder, and fired at the open ends of tubes of various diameters; and he then ascertained the distance at which the sound could no longer be heard, or at which it ceased to act on what he called a sensitive membrane. This was a very flexible membrane, which could be fixed across the tube at various distances, and was provided with a small metal disc in its centre. When the membrane began to vibrate this disc struck against a metallic contact, and thereby closed a voltaic circuit, which traced on a chronograph the exact moment at which the membrane received the sound-wave."

In this way Regnault discovered that the report of the pistol affected the sensitive membrane at a distance of

4,156 metres	in a tube of 0.108 m. diameter.
11,430 "	" " 0.300 m. "
19,851 "	" " 1.100 m. "

but that the sounds were no longer audible at the distances of 1,150, 3,810, and 9,540 metres respectively in tubes of the diameter just given. Regnault also discovered that a bass voice is heard at a greater distance than a treble in tubes. His observations are of the greatest practical value in regard to speaking tubes of several kinds.

The principles underlying the phenomena of the speaking-trumpet are not quite the same, as they are not only dependent on the conductivity of sound in tubes, but on the reflection of sound—a part of our subject not yet touched upon. At the same time, it will be more convenient, from a practical point of view, to treat now of speaking-trumpets and, more particularly, of fog-horns, in connexion with the transmission of sound in tubes, and from conical or

cylindrical vessels. The student of engineering will see that the subject of fog-horns and syrens and their establishment in proper situations and under the best local circumstances, is intimately connected with the building and construction of lighthouses, of which such apparatus form a principal part. Now we shall see, also, where some of the information on meteorology given in the last article of this series comes in.

The sole function of the speaking tube is to render the voice audible at greater distances than it would be without such assistance. It is a very simple affair, consisting of a tube of tin or brass, somewhat smaller near the mouth-piece than at the other end, where is affixed a wide bell-shaped expansion of similar metal. The sounds given out by the instrument are stronger, not only in a straight line with the tube, but for distances surrounding that direction. This is explained by the circumstance that the inflated end, or "bell," allows a large body of air to be set in consonant vibration prior to its diffusion.

It was believed for a long time that not only light but sound was impeded by dense fog, and that acoustic signals would be materially interfered with from this cause. This idea originated in a paper by Mr. Derham printed in the Philosophical Transactions in 1768, in which it was affirmed that the power of a fog to arrest sound was strictly in proportion to its capacity to impede the transmission of light. The same author also considered that both rain and snow impeded sound; but all this is now known to be incorrect. It is not the presence of water in any form which offers an obstacle to the passage of sound in air, but varying conditions of the air itself—the presence of regions of unequal condensations and rarefactions succeeding each other. Tyndall has shown that, with such a series of irregular and varying air-strata to pass through, the free play of the sonorous vibrations is embarrassed and confused, and such a condition of the atmosphere is brought about as led him to style it as of "acoustic opacity." This condition is quite commonly met with when the air is visually as transparent as it can possibly be. The unequal heating of air does far more to render it impervious to sound than any amount of mist, rain, or snow in it.

There being no difficulty whatever to the passage of sound in fog, it became evident that at such time when light fails, lighthouses should be equipped with apparatus for producing sound, and that the latter would also be of the utmost service in foggy weather in daytime also. It was obvious that the speaking trumpet, actuated by the human voice, was not powerful enough for the purpose, so attempts were made to produce loud noises by other means. Bells, horns, and whistles have been employed, and, more recently, explosions of gunpowder and gun-cotton. Bronze howitzers were employed for firing off the powder, in the belief that bronze would give a better sound than iron. Professor Tyndall soon showed, however, that the bell-like sound which was expected from such guns was lost long before the actual explosion of the powder. This led to the discovery that it was best to cause the powder to explode in a strong speaking trumpet, or fog-signal gun, as it was called. But we will not anticipate; let us review the most important means adopted for producing sound for lighthouse purposes.

**Gongs.**—The best that have been employed are, of course, of Chinese manufacture. These vary in size from 1 ft. 7 in. to 2 ft. in diameter, and weigh up to 40 lb. Some years ago these were in common use along our coasts; they were invariably struck by hand. The chief objection to them is that the sound, although well adapted to catch the ear, cannot be heard at a greater distance than a quarter of a mile, though under exceptionally favourable circumstances a gong has been heard as far away as three miles, for it is on record that some thirty years ago the gong of the "Warner" light-vessel was heard at the "Nab." On the other hand, gongs diffuse the sound equally all round and not in a limited direction only—hence their use so largely at that time in light-vessels.

**Bells.**—Some lighthouse bells used weighed upwards of 2 tons; the use of warning bells round our coasts now is almost entirely confined to bell-buoys for channel navigation. It was found that a better sound was produced by striking with a hammer than by the action of a tongue set in motion by swinging the bell. The range of the sound increases with the rapidity of the strokes. A bell weigh-

\* Cf. Ganot's "Physics," 1893, pp. 209, 210.



ing 220 lb. struck by a hammer weighing 11 lb., falling 7½ in. and immediately set off by a spring has been heard at a distance of 1,320 yds. against a fresh breeze, at 1½ mile with the wind running transversely, and at 2½ miles travelling with the wind. In another experiment with the same bell, but furnished with a hemispherical iron reflector 4 ft. 11 in. in diameter, so as to reflect the sound and throw it as far as possible, and a breeze running with the sound, the bell was heard at 4.75 miles over an arc of 60 deg. A bell at Howth, near Dublin, weighing 2½ tons and struck four times per minute by a hammer weighing 60 lb., falling 10 in., has been heard only 1 mile to windward in fog, against a light breeze. A similar bell at Kingstown struck eight times per minute has been heard at a greater distance than 3 miles. Warnings by means of bells have, of course, been largely superseded.

**Guns.**—We have already alluded to the use of a gun shaped like a speaking trumpet. Such a gun, in its earlier forms, was loaded at the breech and contained a series of chambers brought into play in rapid succession after the manner of a revolver. The bell-mouth of the gun projects the sound over the sea in the direction required. Gun-cotton communicates a more rapid and energetic shock to air than gunpowder, and generates a more space-penetrating sound. This gun-cotton in certain forms of gun employed was suspended by a wire in the focus of a cast-iron reflector. The sound apparatus, however, did damage to the lighting apparatus, and in time a method was devised for firing the gun-cotton in the air attached to the head of a rocket.

**Signals under Water.**—The belief that fog largely intercepted sound led to some interesting experiments being carried out under water.\* It was ascertained that subaqueous sounds were reflected at the surface at such angles as rendered it impossible to hear them above water for distances exceeding 220 yards, though more recent researches have led to improvement in that respect. By using an instrument contrived for listening in water, the sound of a bell was heard at about 8½ miles, and in later experiments distinctly audible sounds were transmitted under water to a distance of about 2½ miles.

## Correspondence.

To the Editor of THE BUILDER.

### "LATER RENAISSANCE ARCHITECTURE IN ENGLAND."

SIR.—In the notice of "Later Renaissance Architecture in England," edited by Mr. John Becher and Mr. Macartney, which appeared in the *Builder* of the 16th inst., the writer suggests that there is something in the nature of a "ruse" in the "notice to subscribers" sent out in the first part of the work, to the effect that it was thought desirable to issue the plates in such a way as to give the greatest variety in each part, rather than to include in one part all the plates of a subject which it is intended to include in the complete work.

In this arrangement, which I may say has met with general approval from the subscribers, the very suspicious writer of the notice affects to see a "little ruse" to "compel subscribers to take all or none." Now as every one subscribing has by so doing agreed to take all, it is an obvious absurdity to suggest that the notice or the plan adopted (whichever the writer may mean) can have been intended to "compel" him to do so, and the suspicion hinted by the critic is but an unkindly attempt to find fault without cause.

That the members of the profession have seen no reason to doubt the perfect bona fides of the gentlemen who are editing the book, or myself as publisher, as to the manner of its publication, is established beyond a doubt by the imposing "list of subscribers" which I shall have the pleasure to print in the concluding part of the work.

I am sure you will think it right to insert these few lines in the next number of the *Builder*, and I shall be obliged by your doing so.

B. T. BATSFORD.

### OBITUARY.

**MR. HUDSON REAH.**—The death has just taken place of Mr. Hudson Reah, who for twenty years had occupied the posts of Borough Surveyor and Water Engineer of Preston. Mr. Reah, previous to being appointed Borough Surveyor of Preston in 1878, held a similar office at Darlington. The deceased gentleman carried out some important works, the chief being the construction of the sewage farm at Freckleton, which cost about 130,000*l.*, and at the time of his death he was super-

vising the works at Alston in connexion with the extension of the Preston water supply by the building of a large reservoir. This latter undertaking, it is expected, will also cost over 100,000*l.* Mr. Reah, who was fifty-eight years of age, leaves a wife, a son, and several daughters.

### GENERAL BUILDING NEWS.

**ADDITIONS TO CHURCH, WHITGIFT, YORKSHIRE.**—The foundation stone of the new portion of Whitgift Church, which is undergoing restoration, was laid on the 12th inst. The work of restoration consists of a new chancel. The nave is also to be restored, and additions are to be made to the roofs. The church is to be seated with open benches. The architects for the work are Messrs. Smith, Brodric, & Lowther, of Hull, and the contract is in the hands of Mr. Stead, of Scunthorpe.

**CHURCH, CLONAKENNY, ROSCREA, IRELAND.**—The foundation stone of the Clonakenny new church has just been laid. The church has been dedicated to St. Brigid, and has been designed by Mr. W. G. Doolin, N.A., Dublin. The contractor is Mr. John Sisk, Cork.

**RESTORATION OF STRATFORD-ON-AVON CHURCH.**—The Collegiate Church of Stratford-on-Avon, the burial-place of Shakespeare, was reopened on the 14th inst. after restoration. The church is a large cruciform structure, dedicated to the Holy Trinity, and stands on the site of one built before the Norman conquest. Portions of the present edifice date from the early part of the thirteenth century, and additions were made in the fifteenth century. Besides the tomb of the Shakespeare family the church contains some fine monuments, among which is that of Sir Hugh Clopton (Lord Mayor of London in the time of Henry VII.), who built the "sumptuous" bridge, mentioned by Dugdale, which spans the Avon at Stratford. Some few years ago Mr. Forster, A.R.A., prepared a scheme of restoration for the church entailing an outlay of 12,000*l.* The work was begun in sections, but when about 6,000*l.* had been spent the operations were suspended owing to the committee being in debt. The liability was eventually paid off, and last autumn it was decided to complete the work if possible. For this purpose an appeal was made for 5,000*l.* more, and the work was resumed at the beginning of this year. It included the relaying of the floors of the nave and transepts, which were in a very insanitary condition owing to interments having been made inside the church for several hundred years, the provision of new heating apparatus, and the reconstruction of the organ. It was also intended to reset the church, to build a new vestry, and to introduce the electric light. After spending over 3,000*l.* on the work undertaken this year the committee are again compelled to stop for lack of funds, though the most pressing part of the restoration has been carried out.—*The Times*.

**CATHOLIC CHURCH, BRAY, IRELAND.**—The new church at Bray was opened on the 10th inst. The church was designed by Mr. W. H. Byrne, architect, Dublin, and the building is being carried out by Messrs. Michael Made & Son. The marble work was divided amongst three Dublin firms. The high altar, by Mr. Early, is in course of erection; it will be in keeping with the character of the church, and will be surmounted by a canopy. The altars of the side chapels and the two smaller altars are in course of erection by Mr. Sharpe, who is also putting in the marble sheeting of the smaller of the side chapels. Mr. Pierce has the altar rails almost completed. They are of Sicilian marble, with pilasters of red marble and bosses of dark green marble. The mosaic in the floor and passages is being put down by the firm of Ophenshimer, and the stained glass was supplied by Meyers, of Munich. The edifice is in the later Romanesque style. The interior length of the church, including the new portion and the old nave, is 154 ft., the width across the nave is 50 ft., and across the transepts 40 ft. The length of the new portion to the ridge of the roof is 77 ft., and to the crown of the ceiling 54 ft. The front and nave portion of the old church for a length of 50 ft. is let into the new building, and this remains for future effort to replace in the style of the new church. The length of the new portion is 104 ft. The depth of the apse is 27 ft., and its width across the chancel arch is 25 ft. 6 in., while the arch rises to the height of 48 ft. All the decorative work, the oil-paintings, and the distemper, were done by Signor Eduardo Buccini.

**PROPOSED CATHOLIC CHURCH, LIVERPOOL.**—It has been decided to proceed shortly with the erection, in St. Bernard's mission, Kinsley-road, Liverpool, of the long-projected new church under the dedication of Our Lady of Lourdes and St. Bernard, to the designs of Messrs. Pugin & Pugin, of London. The estimated cost is about 8,000*l.* The new church, Gothic in style, will consist of a nave and a parallel chapel equal in length; the latter dedicated to Our Lady of Lourdes with her altar and a sacroto.

**TRINITY PRESBYTERIAN CHURCH, LEEDS.**—New buildings are being erected in Harehills-avenue, Leeds, for the members of this church, and the foundation stone has just been laid of a church hall. Besides the erection of the church and the church hall, the scheme includes a mission house, ladies' work-room, and a vestry. Mr. W. H. Beevers is the architect. The buildings are in the Early English style. The vestibules, porches, and corridors will have marble mosaic floors. The windows

will be filled with stained glass leaded lights. The contractors are—Mr. A. W. Hargreaves, mason and bricklayer; Mr. B. Mawson, joiner; Messrs. Watson & Worsnop, slaters; Mr. T. Barrand, plasterer; Mr. S. Farlane, plasterer and concreter; Messrs. C. Walker & Son, painters; Messrs. Talbot & Co., leaded lights; and Messrs. Geary, Walker & Co., London, wood-block floors and mosaic.

**CONGREGATIONAL CHURCH RENOVATION, HINGHAM, NORFOLK.**—Alterations are now being carried out to the Congregational Church at Hingham. Mr. A. F. Scott, of Norwich, is the architect, and Mr. Curtis, of Litcham, is the builder.

**SUNDAY SCHOOLS, MORLEY.**—The memorial-stones have just been laid of the St. Mary's Congregational Sunday Schools and Institute at Morley. The new building will occupy the site of the Old Parsonage, in Commercial-street, and will replace the Troy Hill school. The cost will be 4,680*l.*, and the building will cover an area of about 720 square yards. It is being erected from plans prepared by Mr. Luke Bradley, architect, of Harrogate. A large entrance hall will give access to two recreation-rooms, staircases to gallery and first floor, &c. The assembly hall, 53 ft. by 38 ft., and 30 ft. high, will be top lighted, in addition to having two windows at each end. Four class-rooms, each 14 ft. by 13 ft., and the infants'-room, have their entrance from the assembly hall, the infants'-room also having a separate entrance from outside. On the first floor are ten class-rooms and a gallery, the class-rooms being reached by means of a balcony running down each side of the assembly hall.

**ADDITIONS TO M'CHEYNE MEMORIAL FREE CHURCH, DUNDEE.**—A start has been made with the extensions to M'Cheyne Memorial Free Church, Dundee. About 30 ft. is to be added to the church southwards, and this will permit of 200 new sittings being provided, besides the improvement of the present sitting accommodation. In the upper story of the extended part there is to be a vestry, church officer's house, and various accessories, while below there will be a series of halls—one to accommodate about 500, another 200, and a third 100. The new organ is to be placed in the southmost part of the church, the pulpit being in front of the organ and choir gallery. The new staircase, which is to be erected on the west side with a fleche, and there will also be a fleche and ventilator on the roof of the added part. The contractors for the work are:—Builders, Messrs. J. & C. Hay; joiners, Messrs. Garvie & Farquharson; plumbers, Messrs. James Fyfe & Son; plasterer, Mr. James Laburn; slater, Mr. Andrew Bistart; blacksmith, Mr. George Fraser; all of Dundee; glaziers, Messrs. Cunningham, Edinburgh. Messrs. Sidney Mitchell, & Wilson, Edinburgh, are the architects for the extension, and the work is being locally superintended by Mr. G. A. Harris, architect, and Mr. Robert Lowe, inspector of works.

**WESLEYAN CHURCH, ILFRACOMBE.**—A new Wesleyan church has just been opened at Ilfracombe. The building consists of two stories, the upper one being the church proper. Its form is that of a central nave, at the east being the communion space and choir seats, with transepts divided by arcades of two arches resting on pillars of Aberdeen granite. Other arches open to the tower space at the west end and to the organ chamber and a corresponding recess at the east end. The hammer beam open roof is of varnished pine, and the seating is of Carolina pine. A feature is the stained glass windows. The walls are of local stone, pointed with freestone dressings. There is a gable at the west end, and the church will seat 650. On the ground floor is a schoolroom, 36 ft. by 50 ft., and 16 ft. in height. At one side is a raised platform, divided by movable partitions into six recesses for classes. A class-room, to be also used as a church parlour, will accommodate about eighty, and there are a men's Bible class-room, infants' room, and three ordinary class-rooms. The tower at the north-west angle rises to a height of 130 ft. Mr. W. H. Gould is the architect.

**WESLEYAN SUNDAY SCHOOLS, SHEFFIELD.**—The new premises erected for Sunday Schools, Carver-street, Wesleyan Chapel, have just been opened. There is a lecture hall, and twenty-four extra class-rooms have been provided; while there is a kitchen and the usual outbuildings. The cost has been between 4,000*l.* and 5,000*l.* The new building has been designed by Mr. H. W. Lockwood, and Messrs. Mullock & Co., the contractors.

**WESLEYAN CHAPEL, BARWICK, YORKSHIRE.**—A new Wesleyan chapel is to be built at Barwick, as a memorial to Mr. Dawson. Plans have been prepared for the new chapel by Mr. G. F. Dauby, of Leeds. There will be seating accommodation for about 210 worshippers, and, in addition, a schoolroom, which will be separated from the chapel by a partition, and this will give room for eighty persons. A vestry and kitchen will form part of the premises, which will be erected in a central position near the village maypole. The total cost, including the site, is expected to be about 2,000*l.*

**BAPTIST CHURCH FOR NORTHAMPTON.**—The new premises erected for the Baptist Church, Northampton, the erection of which has just been commenced in Adnitt-road, on the Monk's Park estate, was laid on the 14th inst. The church, which will provide accommodation for over 400 worshippers, is expected to cost 1,475*l.*, and is being built by Mr.

\* Cf. A. Beveley, "Min. Proc. Inst. C.E.," vol. xxxii, 1870-71, p. 99.



A. J. Chown, from plans by Messrs. Mosley & Anderson.

**WESLEYAN CHURCH, MUSWELL HILL.**—The memorial stones—thirty in number—of the new Wesleyan Church, Muswell Hill, were laid recently. The present building, intended to accommodate some 430 people, is really part of a larger scheme which provides accommodation for 700 in nave and chancel, with an organ chamber, three vestries, church parlour, and schools for 500 children. The tower and spire, the chancel and the schools, will not be proceeded with at present. The building will be of red brick and stone dressings. The architects are Messrs. Gordon, Lowther, & Guntton, and the builders are Messrs. Castle & Son.

**CHAPEL, PORTHALLLOW, CORNWALL.**—The foundation stones of a new Bible Christian Chapel were laid at Porthallow, St. Keverne, on the 14th inst. Mr. W. P. George, Mullion, is the architect, and the contractors are Mr. W. J. Nicholls (St. Keverne) and Mr. Cook (Rosevear).

**BOARD SCHOOLS, HUCKNALL TORKARD.**—A new Board School for boys has just been opened at Hucknall Torkard. The school is situated in Spring-street, near the old schools, which will now be occupied by girls and infants. There are five classrooms, and it is so arranged that a further room may be added when there is a demand for the extension. Three of the class-rooms are capable of accommodating sixty scholars each, and the others two forty-eight each. There is also a master's room. The cost has been about 3,000l. Mr. F. Evans, of Basford, being the contractor, and Mr. A. N. Bromley, of Nottingham, the architect.

**RESIDENTIAL FLATS, DOVER-STREET.**—On the site of Ashburnham House, to whose history we still refer, is now being erected a block of residential flats. Messrs. Prestige & Co., of Finsbury, are the builders; the architect is, we gather, Mr. J. Macvicar Anderson.

**PROPOSED EXTENSION OF THE CENTRAL MARKETS, LONDON.**—The Markets Committee of the Corporation have presented a report as to the utilisation of the old fish market in Farringdon-road in still further extending accommodation at the Central Markets. They instructed the City Surveyor to prepare and submit a plan and estimate for certain alterations in the internal arrangements of the shops, and providing a main entrance from Farringdon-road. After consulting the tenants, they thought the building should be adapted for the purposes of the colonial and other meat trade. The Surveyor's plan shows twenty-two shops, a total area of 8,482 square feet, and in most cases the shops increased in depth. The estimated outlay is from 8,000l. to 8,500l.

**ALTERATIONS AT THE PEOPLE'S PALACE, BRISTOL.**—The whole of the interior of this building has been taken down and reconstructed. The work has been carried out under the superintendence of Messrs. P. Munro & Sons, architects. The general contractor was Mr. A. J. Beaven. The upholstery and decorations have been executed by Messrs. A. R. Dean, Limited, Birmingham. The steelwork is by Messrs. Sampson & Sons.

**CONSTITUTIONAL CLUB, FARSLEY.**—The contracts for the proposed new Constitutional Club buildings at Farsley have been secured by local contractors. The buildings, which are to be in the Gothic style, will be erected from designs prepared by Mr. C. C. Gamble, architect, Bradford, on a site fronting the main street. The estimated cost of the buildings and site is upwards of 2,000l.

**EXTENSION OF VOLUNTEER HEADQUARTERS, ABERDEEN.**—A two-story building is to be erected at the headquarters of the 1st Aberdeen Artillery Volunteers, North Sill, building, according to plans by Mr. A. Mavor, architect, Aberdeen. On the ground floor will be the armoury, equipment stores, colonel's room, orderly-room, and officers' room. Adjoining will be a new battery for garrison guns—a hall 70 ft. by 33 ft. On the first floor will be a lecture-room, 50 ft. by 25 ft., reading-room for men, 35 ft. by 24 ft., recreation-room and reading-room for non-com. officers, 25 ft. by 18 ft., besides residence for the caretaker.

**HOTEL, SHERINGHAM, NORFOLK.**—On the 14th inst., a new Grand Hotel was opened at Sheringham. The hotel is built of red brick and white stone. Over the central entrance, which is approached by a flight of circular steps, are bay windows with gable. At the north-east and north-west corners are bay windows, which finish up in the form of cupolas in copper, and surmounted by finials. On either side of the principal entrance, and between these two turrets, are bay windows. On the north-west side of the hotel is the winter garden, with a sun gallery, colonnade, and verandah. The main entrance of the hotel opens out into a central hall. To the right and left of this are corridors. That on the west side leads to the reading, dining, and billiard rooms; that on the east to the dining and drawing rooms. Opposite the chief entrance is the manager's office and the main staircase, and a little to the left of the latter the hydraulic lift. The staircase is lighted with circular stained glass windows. On the first three floors the corridors are west, and near their extreme ends are intersected by short corridors on the three floors. There are eight private sitting-rooms in all. These face north, and some are provided with balconies, approached by French windows. All the bed-rooms have fireplaces in them. The total num-

ber of bed-rooms for visitors is 120. Of that number some are on the fourth floor, where also the servants' rooms are placed. At either end of this floor are five large water tanks, each having a capacity for 600 gallons. At the back of the central hall is the south corridor, and the basement are the pantry, scullery, kitchen, servants' hall, and the sleeping apartments of the men servants. The laundry and stables adjoin the south-west end of the hotel. The architect of the work has been Mr. Herbert J. Green, of Norwich. Messrs. J. Youngs & Son, of Norwich, were the contractors, while the furnishing and decorating has been carried out by Messrs. Trevor, Page, & Co., also of Norwich.

**CONVERSION OF THE EMPIRE THEATRE, COVENTRY.**—The plans for the conversion of the old and disused theatre in Smithford-street into a modern assembly and dancing hall, are now completed. Messrs. Owen & Ward, of Birmingham, are the architects. In the new building there will be upon the ground floor an assembly room with kitchen and other offices. On the first floor a ball-room is planned, with a length of about 90 ft., and a width of 40.

**LIFEBOAT HOUSE, EASTBOURNE.**—On Saturday last week the foundation stone was laid of a new lifeboat house for Eastbourne, as a memorial to the late William Terriss. The new lifeboat house will be 50 ft. long and 20 ft. wide, built in Keymer red brick, with Victoria stone dressings, pilasters, balustrade, and ornamentation. The roof will be flat and asphalted. Mr. W. T. Douglass, engineer and architect to the Royal National Lifeboat Institution, has prepared the plans.

**NURSING HOME, ASCOT.**—The Duchess of Albany recently opened the Cottage Nursing Home at Ascot, which has been named after her Majesty, the Queen. The home, in addition to providing the necessary accommodation for nurses engaged in district nursing, contains three wards of two beds each, and a single bedded ward for special cases. The architect was Mr. Menzies, and the builder Mr. Charman. The home is of red brick, and is situated near All Souls Church.

**ENLARGEMENT OF PUBLIC SCHOOL, ABERDEEN.**—A new gymnasium and manual instruction and cooking-rooms are to be built at King-street Road, and alterations and additions are also to be carried out on the main building. Tenders by local tradesmen for the execution of the various works have been accepted, amounting in the aggregate to 2,187l. 8s. The plans, specifications, &c., are by Mr. J. A. Ogg Allan, Architect and Master of Works to Aberdeen School Board.

**VOLUNTEER DRILL HALL, HERTFORD.**—The Drill Hall for the 1st Herts R. V. has just been opened by the Countess Cowper. The building is constructed of red brick, with slated roof. Mr. James Farley, of Hertford, was the architect; and the builders were Messrs. R. Ginn & Son, of Hertford.

**PROPOSED WORKMEN'S DWELLINGS, HULL.**—A Local Government Board inquiry was held at the Town Hall, Hull, on the 15th inst., by Mr. G. W. Wilcock, M.L.C.E., in relation to providing new artisan dwelling houses in place of those it is proposed to remove in connexion with the Savile and Prospect streets scheme. The Town Clerk said that under the Hull Corporation Act of 1897 they were authorised to acquire a considerable number of properties situated in Savile-street, Vincent-street, and adjacent streets for the purpose of carrying out a scheme of street improvement by the construction of two new streets, a scheme which they believed would improve the communications of the town. The properties to be acquired included about 120 houses occupied by the labouring classes. The bill he had mentioned contained the usual clause, requiring the Corporation to obtain the approval of the Local Government Board to a scheme for providing new dwellings in place of those to be demolished, regard being had to the amount of vacant suitable accommodation in the neighbourhood. Mr. A. E. White, the City Engineer, gave evidence in support of the Town Clerk's statement, and added that the unoccupied houses in the central portion of the city were quite ample for those who would be displaced under the scheme of the Corporation. In his opinion there was no reason whatever to provide special provisions for the houses that were to be demolished. Mr. F. Hirst, building surveyor, also gave evidence, adding that the number of houses for working men exceeded the demand, hence the number of unoccupied houses in the older portion of the city.

**PHYSICAL LABORATORY AND PUPIL TEACHERS' CENTRE, DOUGLAS.**—A physical laboratory in connexion with the higher grade school and a pupil teachers' centre for the town were opened at Park-road, Douglas, recently. The new school has been erected on a portion of the site occupied by the higher grade schools, from the designs of Mr. V. Cubbon, architect of the existing schools. The main entrance is through the boys' playground. The accommodation on the ground floor consists of a physical laboratory, fitted with benches for about twenty pupils. The upper floor consists of pupil teachers' centre, and includes lecture-room for forty pupils, and class-room, adjoining, for thirty-two. These rooms may be converted into one by means of a sliding partition. Cloak-rooms are provided for both sexes. The buildings have been designed to harmonise with the existing schools. The heating is by means of hot-water pipes, and Shortland's

patent ventilating grates. The ventilation is secured by numerous fresh-air inlets and exhaust cowls on the roof, the up-current being assisted by Stott's patent sun-burners. The contract has been carried out by Mr. R. F. Douglas. The dressed stonework has been executed by Mr. R. W. Greer, of Douglas. BATHS AND WASH-HOUSES, DUMFRIES.—Public baths and wash-houses, which have been presented to the town of Dumfries by Miss McKie, of Moat House, were formally handed over by her to the Town Council on the 14th inst. The building, which has been erected in the Greensands Park, contains ten separate washing apartments, with laundry room, eight plunge baths, and two spray, shower, and wave baths. It has been built from the plans of Mr. Barbour, Dumfries, and the cost will approximate to 4,000l.

## SANITARY AND ENGINEERING NEWS.

**SWIMMING POND, ABERDEEN.**—The new Corporation swimming pond at Aberdeen sea beach was opened on Wednesday last week. It is an underground structure, with concrete walls, and is lighted by cupolas and prismatic lights on the roof. The pond is 90 ft. long by 35 ft. broad. The gallery accommodates 1,200 spectators. The electric light has been introduced. The new wing for plunge, Russian, and sitz baths (of compressed Runby brick) is not yet finished. The total cost, including the original block, is 12,000l., and Mr. John Rust, City Architect, furnished the designs and schedules. Mr. John Ogilvie was inspector of works for the Corporation.

**RAILWAY EXTENSION TO THE NORTH CORNWALL COAST.**—At the beginning of August the system of the London and South-Western Railway will be extended to Bude, on the coast of North Cornwall. The new line is a continuation of the branch railway from Okehampton to Holsworthy, the distance from Holsworthy to Bude being ten miles three furlongs. Immediately after leaving Holsworthy, the line crosses the Deer Valley, over which it is carried by a viaduct of nine arches, each of 50 ft. span, the height from the permanent way to the valley being 89 ft. There being no suitable building material in the district, it was decided to construct the viaduct wholly of concrete, and this has been done. The piers and arches were built with blocks of concrete, and the foundations and abutments of concrete in mass, the whole of the material being made with broken stone found in the neighbourhood, mixed with inland sand brought from Plymouth and Bideford. At Woolston there is a second viaduct of similar design, but this is not more than 60 ft. high. There is only one intermediate station, and this is placed at Whitstone, about midway between Holsworthy and Bude. The site of the terminus in Bude is close to the junction of the Bude and Stratton main roads, half a mile from the centre of the former town. The station is of red brick, relieved by white quoins. Here, as also at Holsworthy and Whitstone, ample platform accommodation has been provided, and in addition to cloak and retiring rooms, there is to be at Bude a refreshment buffet. A branch line for the purposes of goods traffic has been laid to the basin of the Bude Canal, and another branch may eventually be carried to Marhamchurch, within easy reach of Wilmouth Bay. The railway from Holsworthy to Bude consists in the first instance of a single pair of rails, but land has been taken, and viaducts have been constructed, so as to permit of the introduction of a second set of metals, and the directors of the South-Western Company are prepared to double the line whenever the local requirements may necessitate larger provision for the traffic. The ruling gradient is 1 in 73. Tye's tablet system will be used in working while the line remains single. Messrs. John Aird & Son are the contractors, Mr. W. Granger being the local representative of the firm. The line was designed by Mr. W. R. Galbraith, the Consulting Engineer of the London and South-Western Railway Company, and constructed under his personal supervision and that of his partner, Mr. R. F. Church, the Resident Engineer being Mr. E. Connal.

**ROYAL COMMISSION ON SEWAGE DISPOSAL.**—The Royal Commission on Sewage Disposal held three sittings last week. The members present were:—Lord Idlesleigh (chairman), Sir Richard Thorne, F.R.S., Professor Foster, F.R.S., Professor Ramsay, F.R.S., General Carey, Dr. Russell, Colonel Harding, Mr. Killick, Mr. Cotton, and Mr. F. J. Willis (secretary). The following witnesses were examined:—Mr. Deane of the Local Government Board for Ireland and Mr. Murray of the Local Government Board for Scotland, Mr. Tatton, Mr. Scudder, and Mr. Wilson, on behalf of the Mersey and Irwell Rivers Board, Mr. Naylor on behalf of the Ribble Rivers Board, and Mr. Trevor Edwards and Dr. Wilson on behalf of the West Riding Rivers Board. We understand that the commission intend to undertake a considerable amount of bacteriological and chemical work, and that no further evidence will be taken until September next.—Times.

**INSTITUTION OF JUNIOR ENGINEERS.**—The Summer Meeting of the Institution of Junior Engineers is to be held at Liverpool, from August 8 to 13.



## FOREIGN.

FRANCE.—On the proposal of M. Chas. Lucas, the "Vieux Paris" Committee has asked the Municipal Council to arrange with the Government that the two models of the future Champs Elysées palaces should be preserved in the Carnavalet Museum, where it is to be placed, the model of the Hôtel de Ville made by the sculptor Villeminot under the direction of the late M. Ballu.—M.M. Dalou and Georges Gardet are at work on the models for the four lions intended for the Alexandre III. bridge.—M. Buquet, the architect to the Palais Bourbon, has commenced the works for the reconstruction of the Chambre des Députés on the site of the Cour d'Honneur adjoining the Rue de Bourgogne. The cost is estimated at three million francs.—M. Garnier is just completing the new Mairie at Asnières. The cost has been 870,000 francs.—There is talk of raising to the memory of Lamartine a monument more worthy of his reputation than at present exists in Paris, where the poet is only commemorated by a bad though pretentious statue in the small square adjoining the Avenue Victor Hugo.—It is proposed to raise, at Tarascon, a monument to the memory of Nicolas Laugier, the drummer whose name is famous in connexion with the battle of Arcola. M. Amy is the sculptor.—In spite of numerous cholera epidemics, nothing has been done for years towards the sanitary improvement of Toulon, which to this day has no proper sewer system. The state of the city forms a permanent danger which may be said to concern the country generally, for it has almost always been at Toulon that the cholera has made its first appearance, before spreading to the rest of France. It is now stated that the local authorities at Toulon are at last taking active steps to obtain Parliamentary powers for an adequate scheme of sanitation.—The new prisons at Fresnes-Rungis, to replace the old goals of Mazas, Roquette, and St. Pelagie, were formally put in operation last week.—M. Falguère has just completed the model for the Pasteur monument intended for the Place Médecins, where it will replace the fountain basin decorated with M. Crank's Tritons and Nereids. The monument, which will be in marble, will consist in part of a square pedestal raised on three steps and decorated with bas-reliefs. On the principal face is shown the figure of Death, armed with his scythe, flying before a group of figures who appear as if restored to life or rising from the tomb. (The design would be more to the purpose if Pasteur had contrived any means to abolish death, instead of merely closing one avenue to it). On the three other faces are groups of figures and animals recalling Pasteur's principal discoveries for combating rabies, the phylloxera, and other enemies of human health and prosperity. Above is the seated statue of Pasteur, crowned by a figure of Fame in gilt bronze.

## MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Rugby Portland Cement Company have acquired the works hitherto belonging to the Rugby and Newbold Cement Company, and from the 1st prox. the business will be amalgamated and carried on, under one management, under the style of the Rugby Portland Cement Co. The company intend to make considerable additions and improvements to the works.

INDIA OFFICE STORE DEPOT.—A select committee of the House of Commons have found as proved the preamble of a bill whereunder the Secretary of State for India seeks powers for the compulsory purchase of a site for a store depot. The land covers about 91,000 ft. superficial in Belvedere-road, Lambeth, and belongs, it is stated, to Jesus College, Oxford.

TRADE DINNER.—On the invitation of Mr. J. Howard Colls the foremen in the employ of Messrs. Colls & Sons spent a very pleasant day on Saturday last at Cambridge and Ely. Leaving London at twelve o'clock for Cambridge, the party, numbering about fifty, visited, after luncheon at the station, King's College, Trinity College, and Library, the Round Church, and other places of interest. Proceeding to Ely, they were met there by Mr. Colls, and a photographic group was arranged, after which the party divided into two sections, one ascending the Trilium, clear story, and lantern of the Cathedral, under the guidance of Mr. Fortescue of the Cathedral, whilst the other visited the choir, chantries, transepts, Lady Chapel, &c., under the care of Mr. Hills, the cathedral vergier. After the first section had descended, the other went up to the lantern. Dinner, presided over by Mr. Colls, was served at the Lamb Hotel in the evening. The Chairman spoke of the pleasure it afforded him to be surrounded on the occasion by so many of those with whom he was brought into daily contact, as well as by a few friends, and he gave the health of "The Guests," calling on Mr. Sidney Young, F.S.A., to respond. Mr. Young, in reply, congratulated those present upon the sensible and intellectual way in which they had spent a holiday. Mr. Davenport (shop foreman) then proposed the health of Messrs. Colls & Sons. He spoke of his long connection with the firm, and of the amicable relations which had always existed between Messrs.

Colls and those in their employ. The Chairman replied, and shortly afterwards the party returned to town.

TOTTENHAM COURT-ROAD IMPROVEMENT.—On the 13th inst., at the Surveyors' Institute, Savoy-street, Mr. James Green, the arbitrator appointed by the Local Government Board, sat to determine the value of the property within the area of the Tottenham Court-road improvement scheme. The first case considered was that of Messrs. William Henry and Richard Baker, lessees of the premises No. 4, Tottenham Court-road. Mr. Lawrence, Q.C., appeared for the claimants, and the Hon. Alfred Lyttelton, M.P., for the London County Council. Mr. Vigers and Mr. Horne, surveyors and valuers, estimated the value of the lessees' interest at 23,400. For the County Council, Mr. Andrew Young and Mr. Wilkinson valued the interest at 21,384. The next case, No. 2, Tottenham Court-road, the property of Mrs. Amelia Lansdale, was agreed to, the value being fixed at 3,232. The premises, No. 9, Bowes-court, and 1A, Tottenham Court-road, the property of Hay's executors, were valued by Sir John Whitcraft Ellis at 22,500. Mr. A. Young and Mr. Wilkinson estimated the value at 14,900. The consideration of the remaining cases was adjourned till the following day, when the first case was the freehold interest in Nos. 4 and 5, Tottenham Court-road. The property was let on lease at a rental of 362l. 10s. per annum, and the estimated value was fixed by Mr. Edmund Farmer, of Messrs. Debenham & Co., and Mr. E. H. Bousfield, of Messrs. E. Fox & Bousfield, at 10,000. For the County Council, Mr. Andrew Young and Mr. Wilkinson valued the freeholder's interest at 8,360. The freeholder's interest in No. 3, Tottenham Court-road, was then considered. The County Council valued the premises at 3,400, and no evidence was given on behalf of the claimant. In the case of No. 5, Hanway-street, Mr. Chadwick estimated the value of the freehold property at 2,175, the valuers of the Council fixing the value at 1,400. The last case was No. 4, Oxford-street. Council for the claimants stated that the premises were let on a ninety-five years' lease at a rental of 800l. per annum. No evidence was called on behalf of the claimant; but Mr. A. Young and Mr. Wilkinson, for the London County Council, valued the freeholder's interest at 43,700. The proceedings were then closed.

NATIONAL MONUMENTS IN CHURCHES.—In the House of Lords, on the 14th inst., the Earl of Camperdown, in moving the second reading of the National Monuments in Churches Bill, said that, as the law now stood, the ordering of everything in their cathedrals and national churches was absolutely at the discretion of the Dean and Chapter, or other persons charged with their care for the time being. It might happen that what one Dean had approved of his successor might see fit to alter. This Bill only proposed to alter the present law to this extent, that when a national monument, as defined in the measure, had been erected, it should not be removed or altered without the permission of the Crown and without the matter having been brought under the notice of Parliament. Lord Belper, on behalf of the Home Office, said they had no objection to the Bill being read a second time. It did with regard to State monuments what the law now did with regard to monuments erected by private individuals. The Bill was read a second time.

FONT, ALL SAINTS' CHURCH, SOUTHPORT.—The font presented to All Saints' Church has been placed in position by the workmen of Mr. J. J. Milson, of Manchester, the contractor. The font is from the design of Mr. Henry Sheldermine.

APPOINTMENT.—On the 13th inst. Mr. J. Diggle, of Heywood, was chosen from amongst thirty-seven applicants as Surveyor to the Mossley Corporation, and Mr. G. H. Taylor, of Mossley, was appointed Sanitary Inspector, the applications for this post numbering forty-six. Mr. Haynes, the present Surveyor, after thirty-five years' service, retires from active work on a pension. He is retained as Consulting Surveyor.

PROPOSED PUBLIC IMPROVEMENTS, BROMSGROVE.—On the 15th inst., Mr. W. O. E. Meade-King, M.Inst.C.E., held an inquiry at the Town Hall, Bromsgrove, touching the application of the Urban District Council for sanction to borrow 1,200l., for purposes of street improvement, and 600l. for the purchase of land for purposes of public walks and pleasure grounds. Mr. B. H. Sanders (Clerk) with Mr. J. W. Hemming (Deputy Clerk) attended to support the application on behalf of the Council, and there were also present Mr. G. H. Gadd (architect), Mr. R. H. Nowell (surveyor), and others. There was no opposition.

THE ROMAN BATHS, BATH.—At a meeting of the Bath Baths Committee on the 15th inst., Major Davis reported the discovery of a consecration cross in the excavations at the Kingston baths. It was the first Christian antiquity discovery on the site, and belonged to the second century. Tenders were ordered to be obtained for making a continuous promenade gallery round the large Roman bath. The Works Sub-Committee were instructed to consult Mr. Brydon, and bring up a scheme for decorating the new concert-room.—Western Press.

CARDIFF BUILDING BY-LAWS.—At a meeting of the Public Works Committee of Cardiff Town Council, held at the Town Hall on the 14th inst.,

under the presidency of Councillor Mildon, a letter was read from the Local Government Board stating that the draft by-laws relating to new streets and buildings were still under consideration. It is now nearly ten years since the first draft of these by-laws was submitted to the board at Whitehall, and owing to the delay in their consideration, and the necessary amendments that were subsequently required, this extraordinary delay has taken place.—South Wales Daily News.

THE BUILDERS' ACCIDENT INSURANCE, LIMITED.—We are informed that Mr. R. S. Henshaw, who has for many years filled the office of Secretary to the Institute of Builders and the Central Association of Master Builders of London, has found it necessary to resign those positions in order that he may devote himself entirely to the increasing business of the Builders' Accident Insurance, Limited. Mr. Thomas Costigan has been appointed to the joint offices of Secretary to the Central Association of Master Builders and the Institute of Builders.

THE NEW GOVERNMENT OFFICES.—In the House of Commons on Monday, Mr. Akers-Douglas, replying to Mr. W. Allan, said that the Government had made a selection of architects for the new Government buildings. They have requested Mr. J. M. Brydon to prepare plans and drawings for the new public offices on the Parliament-street site, and Mr. W. Young to prepare plans and drawings for the new War Office on the Whitehall site. These plans when completed would be considered by her Majesty's Government, and before orders were given to proceed with the buildings the drawings would be exhibited for the inspection of members. In selecting these gentlemen the Government had received invaluable assistance from the Royal Institute of British Architects.

FIRE IN SOUTH LONDON.—A destructive fire occurred on Sunday evening at the premises of Messrs. Barton, Sons, & Holness, builders and sawyers, in Ackworth-street, Old Kent-road. Through some unknown cause a structure, the floors of which measured about 100 ft. long by 50 ft. wide, used as builders' workshops and timber stores, became ignited. The conflagration raged with great fury for about an hour, but was eventually extinguished.

WESTERN BRANCH OF THE SANITARY INSPECTORS' ASSOCIATION.—Members of the Western Branch of the Sanitary Inspectors' Association assembled at Exeter on Saturday last week for the annual meeting, luncheon, &c. The Deputy Mayor (Mr. Alderman Alfred S. Perkins) on behalf of the Mayor and Corporation, extended an official welcome to the members. At the annual meeting of the branch the Hon. Secretary reported the temporary arrangements which had been made for enabling branches to hold annual meetings in either July or August, and that the rule would probably be definitely altered at the Association meeting at Newcastle. Mr. J. Press, of Burnham, was unanimously elected Chairman of the branch for the ensuing year; and Mr. Kirley, Bristol, was chosen vice-chairman. The annual report of the committee stated that there were at the present time sixty-three members and one associate of the branch. At the last annual meeting there were fifty-two members, and one associate. During the two and a half years the branch had been in existence the members had more than doubled in number. During the past year Wiltshire had been added to the Western Branch, and it was hoped that a good many members would be secured from that county during the next few months. Mr. W. J. Siddalls (Tewkesbury) the hon. secretary said that there were about 250 full inspectors, besides a large number of assistant inspectors, in the area covered by the branch. The report was adopted. The following were appointed or undertook to act as delegates:—Birmingham Congress of the Sanitary Institute, Mr. Press and the hon. secretary; Health Congress at Dublin, Mr. Wreford (Exeter); Newcastle Conference of the Association, Messrs. Howard, MacMahon, and Siddalls. The Hon. Secretary reported that other provincial branches had agreed to co-operate in the nomination of members for election as representatives on the Council of the Association. It was agreed that a meeting should be held in the autumn near Bristol, and one in the spring near Burnham, dates to be left to the committee and hon. sec. Mr. Moss Flower was re-elected hon. sec.—At a public meeting for the reading of papers, the Deputy Mayor of Exeter said he had seen that the first sanitary inspector was appointed at Hull in 1848. In suggesting the public benefit that had resulted, he said that, while the average death rate per 1,000 of the population of the county was 20.9 in 1876, it was 18.7 in 1895.—Mr. MacMahon read a paper on "The Position and Prospects of the Western Branch." Mr. D. Cameron, Exeter City Surveyor, read a paper on "Sewage Treatment." He spoke of the septic tank and filtered system of sewage disposal, and thought that sewage could not be satisfactorily disposed of by irrigation. The ideal conditions of sewage disposal were plenty of fall, works which would purify the sewage to enable it to be discharged into the watercourses, and a sufficient area of well-drained sandy loam land, so that the land could relieve the works and the works the land.—At the luncheon, held at the new London Hotel, the principal toast, "Western Branch of the Sanitary Inspectors' Association," was proposed by Mr. Alderman Domville, and responded to by Messrs. Press



and Moss Flower. After luncheon visits were paid to the city septic tank works, the electric light works, sanitary towers at the Devon and Exeter Hospital, public abattoir, disinfecting station, &c. The programme concluded with a garden party at Northernhay House, and tea, provided by the City Council officials.—*Bristol Times and Mirror*.

**METROPOLITAN IMPROVEMENTS.**—We lately directed attention to the demolition of the (old) head post-office of the W.C. district, in the corner of Southampton-street, High Holborn, which is to be re-built for premises to include, on the ground floor, Parr's Bank, pointing out the opportunity thus presented of a much-needed widening of the main thoroughfare. We understand that at the meeting next week of the London County Council their Improvements Committee will submit a scheme for setting back the frontage between Southampton-street and Southampton-row (at the corner of the latter the house is being pulled down), so as to widen High Holborn from 55 ft. to 70 ft., at an estimated outlay of 50,000. A similar proposal will be made at the meeting on Tuesday next that the Council shall co-operate with the Corporation in arranging to set back the frontage of the south side of Fleet-street between Falcon-croft and Temple Bar, into alignment with the widening lately effected at Salisbury-court. The entire project will cost, it is expected, nearly 1,000,000, but the recent demolition of Goslings and Sharpe's Bank, opposite St. Dunstan's Church, facilitates the progress of the scheme at that point. The Committee recommend that the Council shall contribute one half (about 500,000) of the expense of acquiring the fresh line of frontage opposite St. Dunstan's.

**THE SANITARY INSTITUTE.**—The library and reading-room of the Sanitary Institute will be closed during the meeting of the Congress at Birmingham, from September 24 to October 4 inclusive. The museum will be open as usual from 10 a.m. to 6 p.m., and on Monday until 8 p.m.

**WINDOW, ST. MATTHEW'S CHURCH, EVE GREEN, PETERBOROUGH.**—The aisle window in this church has been filled with stained glass to the memory of William Mann Harbord, who died at Maroin, Matabeleland, March 24, 1896. The subject of the window is the calling of St. Matthew. The work has been carried out by Mr. H. A. Hymers, of Chelsea.

**WINDOW, TOWSTOWER CHURCH, NORTH HANTS.**—The east window, five lights and tracery, has been filled with stained glass to commemorate the Queen's Jubilee. The subject of the window is the Crucifixion, carried through the five lights, with basis and canopies of the Perpendicular period. In the centre piece of tracery is the Royal Arms. On either side are shields bearing the dates 1837 and 1897. On the four traceries underneath are the four patron saints—St. George, St. Andrew, St. Patrick, and St. David. The work has been carried out by Mr. H. A. Hymers, of Chelsea.

### CAPITAL AND LABOUR.

**BRISTOL BUILDING TRADE.**—The bricklayers and masons were not associated in the arbitration proceedings which took place in Bristol recently, and consequently the decision of Mr. A. A. Hudson did not affect these branches of the trade. With a view to arriving at a settlement the master builders held a specially convened meeting on the 13th inst., Mr. A. Krauss being in the chair, and it was decided to offer the bricklayers and masons the same terms as those contained in the decision of the arbitrator, viz., "That walking time be allowed at the rate of three miles per hour outside the boundary of Bristol. The boundary to be taken at a radius of two miles from St. Philip's station as a centre, and to include Blackboy Hill, Upper Belgrave-road, to the Suspension Bridge. This rule applies only to men sent from the shop inside such boundary, and not to men engaged and paid at the job." Also, with respect to the question when the increased wages should come into effect, "That the date when the rules are to come into force shall be on September 1, 1898, this, of course, carrying the date when the rise of wages will come into operation." At the same meeting it was resolved that a letter be addressed to the controller of the Commercial Labour Department of the Board of Trade by the President of the Master Builders' Association, and Mr. Curle on behalf of the operative societies, conveying to that Department the highest thanks of the employers and employers for the promptitude with which they acceded to the request for the appointment of an arbitrator, and also conveying the employers and employees' thanks to the Department for appointing Mr. Hudson to officiate in that capacity. The letter also to assure the Department that the arbitrator discharged his duties to the entire satisfaction of both parties, and that his awards were received with great cordiality, and that it was hoped they would be the means of renewing a friendly relationship between employers and employees.

**LANCASHIRE AND CHESHIRE BUILDING TRADE DISPUTE.**—The Executive Board of the Lancashire and Cheshire Building Trades Employers' Federation met on the 15th inst. at the Victoria Hotel, Manchester, to consider the terms proposed for a settlement of the dispute between the employers in the district and the masons. The workmen had agreed

to a rule concerning the fixing of worked stone imported from other towns, and the employers granted an advance of a halfpenny an hour in the wages of the men employed in Manchester and several other towns. Mr. R. Niell, jun., President of the Employers' Federation, presided over the meeting on the 15th inst., which resulted in a settlement of the dispute. The worked-stone rule adopted on the previous Wednesday was confirmed. This rule allows contractors to bring ready-worked stone from one district to another if the districts are equally paid, subject to certain minor restrictions. It was decided to advance wages by 3/4d. per hour, making the rate 9 1/2d. per hour, in Manchester, Preston, and Bury only. The rest of the towns affected by the dispute will have a similar advance in March, 1899. It was also agreed to accept an apprentice rule allowing one apprentice to every five workmen. These terms met with mutual acceptance, so that the strike is now at an end. The dispute has lasted close upon three months, and in Manchester, Preston, Rochdale, Lancaster, Blackburn, Burnley, and Bury the men have been on strike; whilst in other centres in the two counties lockout notices had been posted. In some towns the operatives have been on strike since May 1, and in Manchester they ceased work on the 15th of the same month.

### LEGAL.

#### PLYMOUTH CORPORATION AND ADVERTISING HOARDINGS.

At Plymouth, on the 14th inst., before Messrs. J. H. S. May, Walter Lethbridge, and Colonel Elliott, James Ford was summoned for having unlawfully built an addition to the house, 1, St. George's-terrace, beyond the front main wall.—The Town Clerk (Mr. J. H. Ellis), who prosecuted, said the structure was a substantial wooden hoarding on a wall 7 ft. high, and reached in all to a height of 20 ft. The hoarding was covered by placards, and in consequence of complaints received from the neighbourhood in January last defendant was served with notice to remove it in May, but he had not done so.—Mr. James Paton, Borough Surveyor, said the uprights of the hoarding reached to a height of 13 ft. from the top of the wall, and were clamped to the side wall of the house. The hoarding interfered with the circulation of air to St. George's-terrace and also to Staddon-terrace. Crossed the structure was a building in itself, but it was an addition to a building. For defendant, Mr. Pearce submitted the section did not apply to small advertising hoardings such as this. An addition to a building meant some substantial addition to the building itself. Mr. R. H. Worth, C.E., said the erection was absolutely independent of 1, St. George's-terrace, and the boundary was not moved, it would stand by itself. It could not be by any means be called a building, and was not by any addition to a building.—The Town Clerk contended that the object of the Act was to prevent persons obstructing the circulation of air and light, which the hoarding in question did. The Bench decided that the erection was an addition to a building, and an offence had been committed. A fine of 15 s. per day from the day of notice, and costs, would be inflicted. Mr. Pearce gave notice of appeal.

#### IMPORTANT BRADFORD LIGHT AND AIR CASE.

The case of *Waller v. Outthwaite* came before Mr. Justice Romer in the Chancery Division on the 19th inst. The plaintiffs were the owners of the Plasterers' Arms public-house, Long Croft-place, Bradford, and they asked for an injunction to restrain the defendant from building a warehouse at the top of their premises in such a way as to obstruct the access of light and air to the back rooms of the public-house. The defendant was proposing, when the action was brought, to build a warehouse 43 ft. 6 in. high, and had now completed his building.

Models of the two buildings were put in before his lordship, who said that there was no doubt that there would be great interference with the light and air of the plaintiffs' premises, and, after evidence had been called for the plaintiffs, his lordship said that there must be a mandatory injunction to pull down. It might be that terms could be arranged that would do, but it might be wise for the plaintiffs "not to open their mouths too wide," as they might drive the defendants to submit to a mandatory injunction, and that would do the plaintiffs no good.

Counsel for the plaintiffs said that he thought that a *modus vivendi* could be arranged.

His lordship made an order that the defendant should take down or remove any building which he had, since the commencement of the action, erected or built on his site so as to obstruct or interfere with the plaintiffs' ancient light to the rooms at the back of their premises, and which the plaintiffs had enjoyed before the defendant had committed the acts complained of. The mandatory order was that the building should be pulled down within three months.

Order accordingly. Mr. Ralph Neville, Q.C., and Mr. Younger appeared as counsel for the defendant, and Mr. Farwell, Q.C., and Mr. Methold for the defendant.

#### UNION CONGREGATIONAL CHAPEL, HORSLEYDON V. SOUTH-EASTERN RAILWAY COMPANY.

THIS was a compensation case and was tried on Saturday last before a jury at Red Lion-square. The premises in question comprise chapel and schools. The property is freehold, and the area of the land 5,523 ft. The trustees only desired the cost of reinstatement, so that they might continue their work. The counsel leading for the trustees was Mr. Freeman, Q.C.; and for the railway, Mr. Littler, Q.C. The surveyors for the trustees were Mr. Alderman Green, Mr. W. C. Cooke, Mr. Feild, and Professor Banister Fletcher, the surveyors accepting the professor's figures as to the cost of rebuilding.

Two items in the claim had to be withdrawn, first the minister's salary during rebuilding, as it was ruled by the under-sheriff the minister must claim and not the trustees, and secondly, the cost of faculty and removal of the body, which the railway undertook to carry out. The claim was 12,000.

The surveyors for the South Eastern Railway were Mr. Wilkinson, Mr. Humphrey Davis, Mr. Rousfield (of Messrs. Fox & Bousfield), and Mr. Ryde. Mr. Humphrey Davis placed the value at 4,620l., and for the re-instatement 4,710l. Mr. Wilkinson valued at 4,950l.

The jury returned a verdict of 10,500l.

### MEETINGS.

SATURDAY, JULY 23.

*Royal Archaeological Institute.*—Annual Meeting, Lancaster (continued).

*Plymouth Architectural Society.*—Visit to the Palace Theatre, Plymouth, by permission of the architects, Messrs. J. T. Wimpey & Arber.

*Northern Architectural Association.*—Annual Excursion, to York. The party will assemble at York Station 11:23 a.m.

MONDAY, JULY 25.

*Institute of Sanitary Engineers (Chancery-lane, W.C.)*—Special Council Meeting. Open to all members. 6.30 p.m.

*Royal Archaeological Institute.*—Annual Meeting (continued).

TUESDAY, JULY 26.

*Royal Archaeological Institute.*—Annual Meeting (concluded).

### RECENT PATENTS:

#### ABSTRACTS OF ACCEPTED SPECIFICATIONS.

*Open to opposition until August 29.*

[1297]. 14,970.—*IMITATION MARBLES, STONES, &c., APPLICABLE ALSO FOR HARDENING STONE AND RENDERING IT IMPERVIOUS*: J. M. Dantell.—A solution is made of water, 176 pints; borate of soda, 22 lbs.; sulphate of alumina and potash, 11 lbs.; and chloride of sodium, 23 lbs., a preparation is made of pine rosin, 22 1/2 lbs., damar gum, 11 lbs.; carnauba wax, 11 lbs.; and paraffin, 8 lb. Alabaster is baked and alumed at 1200-1500 deg. C., reduced to powder, treated with colouring matter, and made into paste. After being polished, the mass is dried in an oven, immersed in the solution, and again dried; it is then immersed in the preparation, when saturation is perfected, the material is taken out of the preparation, and its surface is cleaned by a solvent. For alabaster may be substituted ordinary plaster, alumed plaster, chalk, or any other hydrated calcareous earth, and the processes may be applied to stones, marbles, and natural minerals whose geological constitution presents some degree of porosity.

[1298].—*MEASURING ELECTRICAL POWER*: M. B. Fride.—Taking C for the current, and V for the difference of potential at its terminals, at any instant, the inventor uses three formulae:—

$$VC = \frac{1}{2} [(C+V)^2 - (C-V)^2] \dots\dots\dots (1)$$

$$VC = \frac{1}{2} [(C+V)^2 - (C-V)^2] \dots\dots\dots (2)$$

$$VC = \frac{1}{2} [(C+V)^2 - (C-V)^2] \dots\dots\dots (3)$$

Substituting C for V, or V for C, he gets two more similar expressions. He arranges the various circuits so that some carry currents proportional to C, others currents proportional to V, to the sum of C and V, and the difference of C and V respectively. He places in these various branches indicators to indicate the mean square values of the above-mentioned quantities, so that upon the algebraic addition and subtraction of the indications he obtains a measure of the power VC supplied to the circuit. He interconnects the circuits with resistances, choking coils and transformers, switches, and indicators, to obtain currents proportional to the above-mentioned quantities of suitable value so that the said product VC is more or less directly indicated, without causing the undue waste of power incident to the methods known as the "3-voltmeter method," "3-ammeter method," and others.

[1299].—*DOORS*: W. Frier.—To enable a door to be opened from within by pressure, and prevent it from being opened from without except by a key, the inventor fixes on the door a plate having a double rack, each end of which is connected to a bar or tube running lengthwise with the door, and at each bar's extreme end is a slip bolt which, when the door is closed, engages with the upper sash of the door or the floor. When the door is closed, the slip bolts slip into their recesses, and the door becomes locked from the outside; but pressure upon the door lifts the bolts out of their nests, and so the door opens out, a spring on the bars thus compressed is then released, and the bolt shoots out again, so that the door cannot be closed again from without until the key is applied.

[1300].—*ELECTRIC ARC LAMPS*: Patent *Verwertung* Gesellschaft.—The lamp's principal feature is the circularly bent tubes which form the carbon holders, whereby which has an arm which allows it to oscillate on its centre, it being supported on an axle, and fixed in a fork or carrier; their own weight brings together the extremities of the carbons, and the carbon points are kept at a sufficient distance from one another by means of a cross-bar placed above the centres of the holders, and carrying rollers or springs with iron cores fixed vertically at the centres; the core works or slides in a solenoid, so that on the applica-



tion of the current the iron core is drawn upwards into the solenoid and the rollers at the cross-bar's extremities bear upon the oscillating holder to bring the points into proper position.

15,752.—**SIPHONS FOR PERIODICAL FLUSHING: J. Shanks.**—The improvements are applied to a four-legged submerged siphon having a central fourth leg or upwardly projecting downlet pipe within three concentric shells, the one nearest the central pipe and the outermost one being fixed to a cover, and extending downwards therefrom to within a short distance from the bottom of the cistern, whilst between these the third shell extends upwards from the bottom to near the cover; the confined air space communicates with either (a) a small upper siphon connected to a second small siphon discharging into the downlet pipe of the main siphon, or (b) an added tube containing a pipe which communicates with the siphon above its downlet leg, and another pipe or tube communicating with the siphon's downlet leg.

18,355.—**MANUFACTURE OF ACETYLENE GAS: Jesse G. DeLays.**—By this apparatus the gas is produced automatically, according to the rate of consumption, and also continuously, as the evolution of the gas is not stopped whilst the generator is being recharged or cleaned; it comprises essentially two or more generators containing the calcium carbide, a gasometer, a water tank or reservoir that communicates with the generators by a special form of mercurial valve operated by the bell of the gasometer, and a washer or purifier for the gas.

18,700.—**ALUMINUM SPOON: H. Dwyer & John Skelly.**—The invention (also applicable to grease, oil, or other liquid separators) comprises a tube having a pipe bent to a P-shape; one leg is carried through the bottom of the tube at a short distance above the lower end of the other leg; it is connected a straight pipe whose upper end is carried above the bend of the P-shaped pipe, and is open to the air. In operation the water is led into the tube, ascends the short leg of the bent pipe and the straight tube connected thereto, until the bend is reached, when it overflows, and a complete syphonizing takes place; the straight pipe admits air and stops the syphonizing action when the water falls below the uppermost point of the connection between the straight pipe and the short leg.

19,105.—**CLEANING THE OUTSIDE SURFACES OF STONE OR BRICK BUILDINGS: H. S. Child & A. H. Smith.**—For this process the principle of the sand-blast is adopted; the blast may be produced by steam or compressed air, regulated as required, the force being such that only a thin layer of the outer surface shall be removed.

19,435.—**CLEANING DEVICES FOR SEWERS, DRAIN-PIPES, WATER-CLOSETS, &c.: J. H. H. G. G.**—The device for cleaning is fitted with a reel capable of retaining increased lengths of coil of spiral, and is mounted in a revolving frame.

19,591.—**FIRE-PROOF COMPOSITION SUITABLE FOR BUILDING PURPOSES: H. Roux.**—This is made of: size 3 lbs.; saturated solution of ammonia, 64 ozs.; and saturated solution of potash, 13 ozs.; dissolved in say, five gallons of water; then are added—common soda, 4 lbs.; ground alum, 38 lbs., and tungstate of soda, 14 lbs. With this solution are mixed about a bushel of hay-chaff and half a bushel of ground grey line; the admixture can be used when dry, or for packing and filling when wet.

2,460.—**LEVELS AND CLINOMETERS: J. Kempton.**—The improvement consists of a graduated vertical scale fixed in a small compartment at the end of the instrument; one end of the scale is fixed, at right angles, a piece of metal through which a slow-motion screw passes vertically the screw's end works in a hardened steel set screw, it turns a spindle for a thumb screw thereon. By turning the thumb screw the vertical scale is raised or lowered to the required distance; when the scale is not needed it can be drawn up into the instrument, which latter can be then used as an ordinary level. The scale will show gradients from 1 in 10 to 1 in 400. When a gradient is required the scale is lowered by the thumb screw, then the instrument is laid on a long straightedge, one end of which is raised or lowered as may be necessary, and the gradient is then extended by means of boning-rods to the required distance. For giving the better retaining walls, shafts, &c., a small cross-level is fixed on the side of the instrument, and the scale used as for gradients. The instrument can be used for giving the rise or fall to sewers, water-drains, roads, kerbs, channels, &c.

9,795.—**SAFETY-VAULT CONSTRUCTION: E. C. Shankland.**—To obviate the legitimate recourse to drills or other tools, explosives, or melting or fusing by electricity, the inventor devises a vault framework built up out of a plurality of wall-layers, each composed of parallel ribs embedded in concrete; between the wall-layers he provides a separate interlining layer of high electrical resistance material, and embeds therein broken sections or pieces of tool-resisting metal so disposed as to be electrically insulated from the surrounding metal lining as well as from one another. In the middle of the door is a space or enclosing chamber filled with some material of high electrical resistance and embedded with broken steel rods or pieces of tool-resisting metal so disposed as to be thoroughly insulated.

9,795.—**PIPE JOINTS, UNIONS, &c.: T. F. Hammer.**—Besides the usual two thimbles and nut, is provided a separate ring of soft metal seated between the ends of the thimbles, and having a spherical or bulbous contour externally; in the thimble-ends are formed recesses into which the ring seats so that the thimbles may oscillate slightly about the ring, or the ring in the sockets, until a true seat is found; the head on the one thimble and the bearing flange on the nut have reciprocal faces of such shape that tilting of the one thimble relatively to the other is allowed, the head and flange being preferably made as segments of a sphere, the bearing flange being the sphere of which the adjacent face of the ring is a segment.

#### NEW APPLICATIONS.

July 1—0.

6,511A, J. T. Szek, Floors and Walls, 14,657, W. Oates, Waste Water Closets, 14,666, A. J. Howland, 14,761, W. E. Langdon, Fusible Cut-outs, 14,667, R. Wood, Nails and Spikes, 14,666, J. W. Martin, for Purifying Sewer Gases, 14,661, Buchholz & Taylor, Arc Lamps, 14,665, P. W. H. Gray, Relief Wall Paper, 14,709, G. L. Monro, Saw Fasteners, 14,705, Chidlaw & Jones, Baths, 14,710, T. V. Woodhouse, Boring or Drilling Holes in Earth, &c., 14,715, T. Taylor, Tubular Connections for Electric Wiring, 14,720, F. W. Vickery, Double Side Ruling Machines, 14,722, T. C. Wilson, Gas Cooking Stoves, 14,747, Schilling & Schurz, Metal Pipes with Branch Openings or Connections, 14,748, Thru & De Grave, Smoke Consuming Fire Grates, 14,755, G. Dietmar, Coupling and Uncoupling Alternating Current Dynamos,

14,759, B. Willard, Insulators, 14,763, Hamblet & Parker, Pipes, Conduits, Invert Boxes, &c., 14,800, R. van R. Sill, Electrical Hangers, Rheostats, &c., 14,809, Smith & Willis, Accumulators, Batteries, and Ventilating, 14,812, E. Easton, Bridges, Viaducts, Aqueducts, &c., and their Structure, 14,817, F. J. D. Hillingforth, Metal Pipes, Edgings, &c., for Roofs, 14,823, American Incandescent Gas Company, Heating and Ventilating, 14,826, Westinghouse Electric and Manufacturing Co., Electric Railways, 14,827, C. Weber, Rolls for Binding Structural Pipes, Pipes, &c., 14,830, S. Adams, Drilling Wells, 14,836, F. Price, Apparatus for Cutting Out Circular and Elliptical Discs or Patterns, 14,837, R. A. Douglas, Water-tight Covers and Frames for Street-boxes, Manholes, &c., 14,841, J. Campbell, and 14,864, A. S. I. Robinson, Circular Saw Guards, 14,852, Lissie Franklin, Domestic Fire-escapes, 14,854, F. E. Walker, and 15,038, E. Harrison, Saw Fasteners, 14,873, P. T. Sievert, Sheet and Plate Glass, 14,880, J. Stott, for Ventilating, Heating, Disinfecting, and Cooling Structures, 14,897, De Hailes and others, Protection of Wood against Fire and other Destructive Agencies, 14,901, F. B. De-Foe Paynter, Oil Vaporiser and Burner for Boiler Heating, Cooking, &c., 14,907, F. Klostermann, Arc Lamps, with Magnetic Carbon Movement, 14,918, A. H. O'Neil, Concrete Moulds, 14,927, Bullock & Bell, Slot-irons for Fixing Zig-zag Hurdles, 14,930, R. Richardson, Plough Bit and Trenching Plane Iron, 14,933, F. Mills, Wrench for Stop-nips, 14,934, Clark and Others, Junction Boxes and Fittings for Electrical Wiring, 14,938, F. H. Varley, Electric Motors and Dynamo-Electric Generators, 14,955, P. K. Wood, Rotary Pumps, 14,974, F. Knopf, Scaffolding, 14,984, J. P. Hartman, Percussion Drills, 14,985, Z. Maevsky, Power Motors, 14,997, G. D. Will, Purification of Sewage, Effluents, &c., 15,003, G. Hill, Electric Switches, 15,009, N. Dawson, Domestic Stoves and Fire-grates, 15,009, W. J. Boyle, Door-Hinges, 15,019, R. W. McDonald, Flushing Cisterns and other Appliances, 15,021, S. B. Mitchell, Fixing of Electric Wires and Cables, 15,040, E. M. Hewlett, Circuit Breakers, 15,046, O. O. Ozias, Weighing Apparatus, 15,050, Stanfield & Martin, Chucks for Lathes, Drills, &c., 15,051, J. E. Brown, and 15,052, J. Scott, 15,058, H. W. Headland, Perforating or Cutting Holes in Corrugated and Flat Materials, 15,083A, Seaming & Abbing Gas Regulators, and Cold Water-heating by Gas, &c., 15,099, W. T. Allen, Water, and other Closets, 15,099, Pedrazzoli & Abraham, Sawing Machinery, and Saw Protectors, 15,109, J. T. Hollis, Wood Block Flooding, 15,110, S. B. Bell, Drappers and Standards for Wire Fencing, 15,122, Mary E. Thomas, Brackets for Blinds, &c., 15,126, A. H. Howard, Insulated Electric Cables or Conductors, and Apparatus for Making them, 15,129, J. Richard, View Finders, 15,144, J. Flechtenmacher, Electric Traction, 15,147, M. Hill, Attachments for Wire or other Ropes, 15,149, Straulander, Rogent, & Co., Sulfuric Acid Battery, and 15,150, Electric Arc Lamps.

#### SOME RECENT SALES OF PROPERTY:

##### ESTATE EXCHANGE REPORT.

July 5.—By T. W. GAZE (at Ipswich).  
Kirtan, Suffolk.—"The Kirtan Lodge Estate,"  
503 a. 1 r. 25 p., at £12,150.  
By J. H. G. G. (at Dover).  
Dover, Kent.—20, Union-rd., 220  
1, Liverpool Lawn, f., 600  
44, Church House-st., at 37 yrs., £7,750.  
7 and 15, Herbert-st., 165  
Plainfoot.—Florence-st., f., 212, reversion in 77  
300  
Worlin, Kent.—Three freehold cottages and workshop  
310  
By I. E. GUN (on the Premises).  
Cardiff, Glam.—"The Queens Hotel and a shop adjoining, area 16,000 ft., at 90 yrs.,  
£1,500.  
By GEORGE JACKSON & SON (at  
Henlow, Beds.—"The City Field Farm," 311 a.  
2 r. 8 p., f., at £600.  
By ALFRED RICHARDS (at Ipswich).  
Clifton, E.C., Suffolk.—"Churchy's Farm,"  
72 a. 0 r. 16 p., f., at £400.  
By ALFRED RICHARDS (at Waltham-  
Walthamstow.—Nicholson-rd., 17 building plots, f.,  
By H. HUBERT & FLINT (at Watford).  
Bushy Heath, Herts.—"Transhams," and a r. 25 p., f., at £400.  
An enclosure of land, 1 a. 1 r. 9 p., f., at £400.  
Rickmansworth, Herts.—Coxley Green, two houses and shops, f., at £600.  
Two freehold cottages, with grazing rights, 250  
Two freehold orchards, at 31 p. 8 r., at £1,150.  
An enclosure of pasture, 5 a. 0 r. 31 p., f., at £1,150.  
July 6.—By BIDDLE & BLENCOWE (at  
Bury St. Edmunds).  
Gedding, Suffolk.—"The Gedding Green Estate,"  
150 a. 1 r. 25 p., f., at £1,150.  
Chevington, Suffolk.—Enclosures of land, 72 a.  
1 r. 25 p., f., and c., at £850.  
By T. W. GAZE (at Diss).  
Frenze, E.C., Norfolk.—"The Frenze Green Estate,"  
481 a. 1 r. 24 p., f., including adwoson, 11,100  
Scale, Norfolk.—Three freehold houses and shops;  
also six houses  
Bursdon, Norfolk.—The Manor of Brock's Hall  
and Middenhall, with royalties, rights, &c., 940  
Shimpling, Norfolk.—The Manor of Shimpling,  
with royalties, rights, &c., 250  
By BAYNE & CO.  
Camden Town—1 and 3, Torrion-av., u. 40  
yrs., £4,450, at £1,150.  
By JOHN BOTT & SONS.  
Herne Hill, 311A, Millwood-rd., 77 yrs.,  
£7,750, at £400.  
Brixton—22, Effra-park, u. 64 yrs., £2,400, at £200.  
By DALBERG, u. 74 yrs., £6,000, at £295.  
Herne Bay, Kent—8 to 21, King's-ter., u. 75  
yrs., £7,750, at £295.  
By COOK, SMITH, & WAGHORN.  
Southwark—22, and 24, Newington-rd., and 10,  
11, and 12, Maze Pond-ter., u. 36 yrs., £3,750,  
£25, at £1,150.  
14,400

By HENRY HOLMES & CO.  
New Cross—86 to 94 (even), Hatcham Park-rd.,  
u. 47 yrs., £1,150, at £1,150.  
By MARK LEBELL & SON.  
Barnsbury—5, 8, and 9, Victoria-rd., u. 60 yrs., g. r. 100.  
Canning Town—10 to 16 (even), Hill-st., u. 67  
yrs., g. r. 154.  
Barking—1, 3, and 5, Fisher-st., and 1 to 5,  
Morgan-rd., u. 45 yrs., g. r. 154.  
Mile End—37, Carter-st., and plot of land adjoining,  
f., at £300.  
By F. MILLER & REID.  
Olfley, Herts.—"The Olfley House," and o. a.  
2 r. 13 p., f., at £1,150.  
Eleven enclosures of land, 116 a. 2 r. 38 p., f., and  
c., at £1,150.  
"Great Olney Farm," 130 a. 3 r. 9 p., f., and c.,  
at £1,150.  
By ELLIS MORRIS & CO.  
Islington—48, Noel-st., u. 33 yrs., g. r. 65, at £1,150.  
Barnsbury—95, Hemingford-st., u. 44 yrs., g. r. 154.  
61, r. 450.  
Holloway—31, St. James's-rd., u. 63 yrs., g. r. 154.  
101 to 107 (odd), Fairbridge-rd., u. 60 yrs., g. r. 154.  
By DOUGLAS YOUNG & CO.  
Peckham—81, 83, and 85, New-st., u. 75 yrs.,  
£2,400, at £1,150.  
Kenish Town—25, Healey-st., f., at £500.  
Clapham—21, Sibell-rd., u. 64 yrs., g. r. 154,  
£650.  
By J. KIRKTOP (at Holsworthy).  
Hollacombe, Devon.—"Whitcroft and Osborne's  
Farm," 105 a. 2 r. 3 p., at £500.  
By WARNER, SHIFFARD, & WARD (at Leicester).  
Lislock, Leicester.—"Price's Farm," 10 a. 2 r. 2 p.,  
£650.  
Stansford—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 129







## PUBLIC APPOINTMENTS





MARYLEBONE (Aldenhurst-street).—Painting interior—  
T. Cruxes ..... £405 0 Geo. Foxley ..... £285 0  
W. Horne ..... 325 0 W. Brown ..... 285 10  
Stevens Bros ..... 399 10 W. Chappell ..... 265 0  
Marchant & Hirst ..... 76 0

MARYLEBONE (Burghead-road, Old School).—Painting interior—  
Stevens Bros ..... £115 0 Marchant & Hirst ..... £275 0  
McCormick & Sons ..... 65 0 W. Chappell ..... 54 0  
J. Maydon ..... 518 10 J. N. Dyer ..... 266 0

MARYLEBONE (Carlton-road).—Painting exterior and exterior—  
Marchant & Hirst ..... £25 0 E. Telley ..... £151 0  
Stevens Bros ..... 88 10 J. N. Dyer ..... 266 0

MARYLEBONE (Great College-green).—Painting interior—  
Gardner & Hazl ..... £337 0 W. Horne ..... £201 10  
T. Cruxes ..... 415 0 F. T. Chichester ..... 385 0  
Marchant & Hirst ..... 394 0 W. Chappell ..... 265 0  
George Foxley ..... 393 0 J. N. Dyer ..... 266 0

WEST LAMBETH (Crawford-street).—Painting interior—  
T. Freeman & Son ..... £295 0 Star & Son ..... £105 0  
W. V. Gird ..... 625 0 Maxwell Bros. Ltd. ..... 485 0  
J. E. Ford ..... 625 0 Rice & Son ..... 465 0  
Holloway Bros. ..... 521 0 H. Lint ..... 435 0

WEST LAMBETH (Earley-road).—Painting interior and exterior—  
Maxwell Bros. Ltd. ..... £150 0 Rice & Son ..... £167 0  
W. Johnson & Co. Ltd. ..... 135 0 J. Garrett & Son ..... 285 0

WEST LAMBETH (Hackford-road, P.E. Centre).—Painting exterior—  
E. B. Tucker ..... £133 0 R. F. Williams & Sons ..... £105 0  
Maxwell Bros. Ltd. ..... 355 0 H. Lint ..... 435 0  
H. C. Mallett ..... 15 0 Star & Son ..... 26 0

WEST LAMBETH (Ponton-road).—Painting interior—  
T. Gregory & Co. ..... £302 0 Star & Son ..... £21 0  
E. B. Tucker ..... 314 0 J. Garrett & Son ..... 285 0  
Lathby Bros ..... 311 0 E. Nightingale ..... 215 0  
H. C. Mallett ..... 311 0 Rice & Son ..... 212 0  
Holloway Bros. ..... 275 0

WEST LAMBETH (Surrey-lane).—Painting interior—  
T. Gregory & Co. ..... £202 0 J. Garrett & Son ..... £45 0  
E. B. Tucker ..... 234 0 C. G. Gird ..... 415 0  
B. E. Nightingale ..... 309 0 E. Telley ..... 47 0  
Holloway Bros. ..... 495 0 R. E. Williams & Sons ..... 29 0

WEST LAMBETH (Sussex-road).—Painting interior and exterior—  
E. Flood ..... £275 0 Rice & Son ..... £375 0  
Maxwell Bros. Ltd. ..... 507 0 Lathby Bros ..... 256 0  
H. C. Mallett ..... 502 25 E. Telley ..... 47 0  
Holloway Bros. ..... 495 0 R. E. Williams & Sons ..... 29 0

The exteriors of the schools enumerated in the following lists will be painted (except where otherwise stated) between September 17 and October 15, 1898.

CHELSEA (Park Walk).—  
H. Brown ..... £175 0 E. B. Tucker ..... £125 0  
T. Gregory & Co. ..... 173 10 C. G. Gird ..... 415 0  
R. E. Williams & Sons ..... 140 5 E. Flood ..... 118 0  
U. Crake ..... 131 0 Lathby Bros ..... 256 0  
F. G. Minter ..... 137 0 W. Hammond ..... 95 10  
W. Johnson & Co. Ltd. ..... 128 14

CHELSEA (Portobello-road).—  
H. Eady ..... £265 0 W. R. & A. Hide ..... £26 15  
G. H. Sealy ..... 141 15 W. Brown ..... 95 10  
H. C. Clifton ..... 116 0

EAST LAMBETH (Heber-road).—  
T. Freeman & Son ..... £280 0 H. Lint ..... £25 0  
W. C. Bowyer ..... 235 0 J. F. Ford ..... 225 0  
W. Akers & Co. ..... 289 0 Rice & Son ..... 249 0  
Frampton & Co. ..... 229 0 Kemp ..... 140 0

EAST LAMBETH (Victory-place).—  
Maxwell Bros. Limited ..... £205 0 Johnson & Co. ..... £125 0  
Rice & Son ..... 217 0 Star & Son ..... 210 10  
W. & H. Casse ..... 148 0 E. Telley ..... 95 0

FINSBURY (Drury-lane (Day Industrial School)).—  
T. Cruxes ..... £188 0 J. Kiddle & Son ..... £166 0  
W. H. Wignall & Sons ..... 128 0 Marchant & Hirst ..... 135 0  
W. Horne ..... 177 0 B. E. Nightingale ..... 126 0

**C.B.N. SNEWIN**  
MAHOGANY, WAINSCOT, WALNUT,  
TRAK, VENEER, and TIMBER MERCHANT,  
Nos. 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, BACK HILL,  
HATTON GARDEN, and 29, BAY STREET,  
FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
Telephone No. 84 Holborn. This Address: "SNEWIN, London."

FINSBURY (Poole's Park).—  
F. Britton ..... £244 0 Gardner & Hazell ..... £350 0  
Stevens Bros ..... 284 0 Geo. Wain ..... 105 0  
J. Crover & Son ..... 350 5 E. Lawrence & Sons\* ..... 350 0  
McCormick & Sons ..... 340 0

GREENWICH (Creed-place).—  
Thomas & Edge ..... £119 0 H. Somerset & Son ..... £160 0  
C. Foreman ..... 189 0 W. Baskett ..... 144 10  
C. G. Jones ..... 183 0 E. Proctor ..... 140 0  
Jones & Groves ..... 176 5 S. Musgrove\* ..... 128 15

GREENWICH (Edward-street).—  
C. G. Jones ..... £202 0 Jones & Groves ..... £172 10  
C. G. Jones ..... 24 10 E. Proctor ..... 10 0  
W. Baskett ..... 79 10 S. Musgrove\* ..... 57 15

HACKNEY (Hamond's-acre).—Cleaning only—  
A. W. Denry ..... £175 0 Gardner & Hazell ..... £270 0  
Geo. Wain ..... 147 0 J. Morrison ..... 75 0  
J. Kiddle & Son ..... 80 15 Stevens Bros ..... 97 0  
J. Crover & Son ..... 88 0 Marchant & Hirst\* ..... 54 0

HACKNEY (Morning-lane).—  
H. W. Denry ..... £175 0 Geo. Barker ..... £174 0  
Sneem Bros & Co. ..... 147 0 W. Sile & Son ..... 164 10  
W. Sharnum ..... 189 0 J. Kybett ..... 115 0  
McCormick & Sons ..... 375 0 S. H. Cornfield\* ..... 122 0

HACKNEY (Scars-street).—  
Colles Whitcomb ..... £235 0 Geo. Barker ..... £135 0  
J. Morrison ..... 150 0 J. Kybett ..... 115 0  
Geo. Wain ..... 145 10 S. H. Cornfield\* ..... 122 0

HACKNEY (Shan-street).—  
J. T. Kiley ..... £137 5 0 J. Kybett\* ..... £171 0  
Gardner & Hazell ..... 177 7 0 Marchant & Hirst ..... 98 0  
J. Crover & Son ..... 315 10 S. H. Cornfield\* ..... 52 0  
Geo. Barker ..... 311 10

MARYLEBONE (Cannell-street).—  
W. H. Mott ..... £144 10 F. T. Chichester ..... £114 7  
G. Wood ..... 123 6 W. Chappell ..... 265 0  
Biswot & Earwell ..... 121 0  
\* Accepted. † Withdrawn.

#### TO CORRESPONDENTS.

J. & M. (Amount should have been stated).  
NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
We cannot undertake to return rejected communications.  
Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.  
We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

**J. J. ETRIDGE, Jr.**  
SLATE MERCHANT,  
SLATER and TILER.

ESTIMATES GIVEN FOR  
**SLATING AND TILING,**  
To be executed by Contract in any part  
of ENGLAND.

Penrhyn - Bangor,  
Oakeley - Portmadoc,  
And other description of Slates Ready for immediate  
delivery to any Railway Station.

Applications for Prices, &c., to  
BETHNAL GREEN SLATE WORKS,  
BETHNAL GREEN, LONDON, E.

#### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances (payable to DOUGLAS FOURDRINER) should be addressed to the publisher of "THE BUILDER," No. 4, Cannon-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (preparing at the Publishing Office, 29s. per annum, 4s. 6d. per quarter), can ensure receiving "The Builder" by Friday Morning's Post.

**THE BATH STONE FIRMS, Ltd.**  
BATH.  
FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

**HAM HILL STONE DOULTING STONE.**

The Ham Hill and Douling Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son, The Douling Stone Co.).  
Chief Office:—Norton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

Asphalte.—The Scys-1 and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-room granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADV.]

**SPRAGUE & CO., Ltd.,**  
LITHOGRAPHERS AND PRINTERS.  
Estate Plans and Particulars of Sale promptly executed.

4 & 5, East Harding-st., Fetter-lane, E.C. [ADV.]

QUANTITIES, &c., LITHOGRAPHERS  
accurately and with despatch.

**METCHIM & SON** (8, PRINCE STREET, QUANTITY SURVEYORS' DIARY AND TABLES FOR 1898, price 6d. post paid. In leather 1/6. Post 1/11 [ADV.]

THE  
**French Asphalte**  
COMPANY.

Suffolk House, Cannon-street, E.C.  
SUPPLY THE BEST MATERIAL AND  
WORKMANSHIP FOR BUILDINGS,  
DAMP COURSES, AREAS, ROOFS,  
WASHHOUSE AND DAIRY FLOORS  
&c., &c.

This Asphalte was chosen to be  
laid at Sandringham, on the new  
General Post Office, and other  
important buildings.

#### TWELVE GOLD AND SILVER MEDALS AWARDED.

**COPPER AND ZINC ROOFING**  
**F. BRABY & CO.**

LONDON, LIVERPOOL, GLASGOW, BRISTOL.

352 to 264, Euston-rd., N.W. 6 & 8, Hatton Garden. 47 & 49, St. Enoch-square. Ashton Gate, Works, Coronation-rd.

**VIELLE MONTAGNE SOLE MANUFACTURING AGENTS.**

**NO SOLDER. NO EXTERNAL FASTENINGS**

Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.



## ILLUSTRATIONS.

The Chapel to be Erected in Rue Jean Goujon, Paris, in Memory of the Victims of the Bazar Fire.—M. Guilbert, Architect	.....Double-Page Ink-Photo.
Design for Mausoleum.—By Mr. J. L. Williams	.....Two Single-Page Ink-Photos.
Plymouth Citadel: New Recreation and Soldiers' Block.—Mr. T. Rogers Kitchell, A.R.I.B.A., Architect	.....Double-Page Ink-Photo.
Competition Design for Technical Institute and Public Library, West Ham.—By Mr. F. W. Marks, A.R.I.B.A.	.....Single-Page Photo-Litho.
Business Premises, Alloway-street, Ayr. Mr. J. K. Hunter, Architect	.....Single-Page Photo-Litho.

## Blocks in Text.

Plan of St. Martin's, Canterbury. (From Canon Routledge's Book)	Page 92	Memorial Chapel, Rue Jean-Goujon, Paris. Plan	Page 104
Sketches of London Street Architecture.—No. XXVI.	Page 100	Design for Mausoleum. Plan	Page 105
Competitive Design for Technical Institute and Public Library, West Ham.	Page 103	Ground Floor Plan.	Page 103

## CONTENTS.

St. Martin's, Canterbury	91	Memorial Chapel, Rue Jean-Goujon, Paris	104	Sanitary and Engineering News	108
Problems of Modern Industry	92	A Mausoleum	104	Stained Glass and Decoration	108
Notes	94	Plymouth Citadel—New Barracks and Recreation Block	104	Foreign	109
The Royal Archaeological Institute at Lancaster	97	Design for Technical Institute and Public Library, West Ham	105	Miscellaneous	109
British Archaeological Association's Congress, Peterborough	97	New Buildings, Alloway-street, Ayr, N.B.	105	Capital and Labour	109
Sketches of London Street Architecture.—XXVI.	100	Applications under the 1894 London Building Act	105	Legal	111
The Builders' Benevolent Institution: Annual Meeting	101	The Students' Column: Sound, Light, and Heat.—V.	106	Meetings	111
The London County Council	102	Obituary	107	Recent Patents	112
Books Received	102	Appointments	107	Some Recent Sales of Property	113
Correspondence	102	General Building News	107	Prices Current of Materials	113
Competitions	102			Tenders	113

### St. Martin's, Canterbury.\*



HE little book on this church recently put forth by Canon Routledge is in great part a reissue of his paper on the same subject in the "Archæologia Cantabrigiæ" for 1897.

It is of interest for architects in that it gives a clear and detailed account of those structural features of the Church of St. Martin that have been revealed to view during the last year or two by the removal of the internal plastering from the walls of the nave and the lower part of the chancel, and by sundry partial excavations both within and without the edifice. Apart from these technical discussions the professional reader will find in the book a considerable amount of what he will be tempted to regard as "padding," in the form of a historical comment on early events in the annals of British Christianity. Such matters, which really underlie those of a more strictly architectural character, have their own interest and importance, and the author deals with them in scholarly fashion, though from what may be termed the Canterbury point of view. It is not a little interesting to note that the lively controversies in the English Church of the seventh century, which Bede records, have not yet spent their force, and the names of Roman and Celt, of Augustine and of Aidan, have still something of the force of rallying cries. The rival pilgrimages and celebrations of last year at Iona and at Canterbury were proof of this, and many utterances have recently shown that different views of the conversion of England are still taken by north countrymen and by ecclesiastics of the southern province. Readers of Canon Routledge's book will not be disturbed in their traditional faith that Augustine of Canterbury, whom he even calls "great," converted this country to Christianity, whereas the fact is that, though first in the English field, he and his companions only cultivated with permanent success that small portion of

it comprised within the bounds of Kent, while the main work was accomplished by missionaries from another quarter and of a very different calibre. At the same time, Canterbury was of immense importance for the future, in that it kept the door open for the entry of Roman influence, and, when the way had been prepared by Wilfrid of Northumbria, through this open door there entered Theodore of Tarsus, the first occupant of the See of Canterbury who showed any real sagacity and power, and who reduced to the Roman obedience the land that, under other circumstances, might have remained, for a time at any rate, a province of the Celtic church. The object of this notice is not, however, to discuss the Augustinian legend, but to bring out the more strictly architectural interest of the story that Canon Routledge has to tell.

The Church of St. Martin differs from the other existing buildings in the country for which a pre-Saxon origin has been claimed, in that we have a distinct mention of it in Bede, who on Canterbury matters was well informed. Bede speaks of it as "a church built of old time in honour of St. Martin, while yet the Romans were in occupation of Britain." The same historian mentions another Romano-British church that had survived at Canterbury, and tells us that Augustine recovered it, dedicated it in the name of the Saviour, and made it the episcopal seat of himself and his successors. This was the beginning of the Cathedral of Canterbury. Bede, too, speaks of the "restoration" of churches generally as being part of Augustine's work, so that it is evident that the monumental remains of British Christianity had not, in Kent at any rate, been entirely swept away. A Canterbury writer of the fourteenth century, whose information is always regarded as drawn from fairly reliable sources, tells us something about yet another building that had survived to Augustine's time from earlier days. The writer, Thorn by name, was a monk in St. Augustine's Abbey, and he is speaking of the building called St. Pancras' Church, substantial fragments of which are still to be seen within the ancient precincts of this very Abbey. This, he says, was a temple or idol-house that King Ethelbert was wont to use, and Augustine "changed it into a church" and "dedicated it in the name of the martyr St. Pancras."

Leaving the Cathedral out of account, we have these *primæ facie* reasons to believe that the sites of St. Martin's and St. Pancras were occupied before Augustine's coming by buildings which, in the former case at any rate, were of a Christian character. The remains at St. Pancras have the form and orientation of a church, and resemble no known "temple or idol-house," so that, if Thorn's account is to be trusted, the building used by Ethelbert may have been desecrated from Christian use and have been originally a church. The archæological problem presented to readers in the book before us is, accordingly, the following: Given early Christian churches on the two sites under consideration, when were they likely to have been built, and to what period or periods belong the existing remains?

So far as the literary evidence goes, the original building at St. Pancras may be of any early date, but the words of Bede about St. Martin's indicate a distinct *terminus antiquæ*, and forbid us to assume the very early date that Canon Routledge suggests for it when he claims it to be "the oldest existing church in Europe" (p. 92). Bede may or may not be right in the notice of St. Martin's already quoted, but he does not say, as Canon Routledge makes him say in his translation on p. 4, that the church was "dedicated to the honour of St. Martin, and built of old, while the Romans were still occupying Britain." Bede's words are: *Ecclesia in honorem Sancti Martini antiquitus facta, dum adhuc Romani, &c.*, and they distinctly mean that the edifice was "built in honour of St. Martin." *Ecclesia in honorem Sancti Martini* does not mean "a church dedicated to St. Martin," which, according to the usage of Bede, would be *Ecclesia Sancti Martini*. St. Martin would not have had a church called after him in his own lifetime unless he had founded it himself, and the suggestion in the book before us that he may actually have visited Britain does not seem admissible. A visit of St. Martin to Britain and to Canterbury would certainly have left some record. Bede's words, therefore, assuming his knowledge to be correct, limit the building of the original St. Martin's to a date after St. Martin's death, or about 400 A.D.

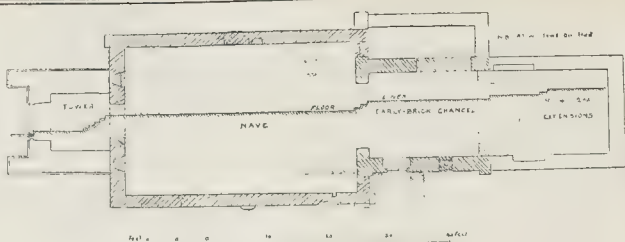
The question to what period or periods belong the existing remains on the two sites is a more complicated one, and the new evidence

\* "The Church of St. Martin, Canterbury, an illustrated account of its History and Fabric." By the Rev. C. F. Routledge, M.A., F.S.A., Hon. Canon of Canterbury. London: George Bell & Sons. 1898.

recently brought to light has already formed the subject of considerable discussion among archaeologists. As no agreement has yet been arrived at, and as the matter in question is of interest to members of the profession as a chapter in the history of our national architecture, it may be worth while to summarise the evidence which has been so carefully marshalled in the book before us.

Canon Routledge wisely avoids dogmatism, and contents himself with laying before the reader the grounds for claiming an early (pre Saxon) date for part at any rate of the existing building. St. Martin's Church (as is seen in the plan reproduced in fig. 1 from the book) consists now of a western tower, nave, and long chancel; but the only parts that claim consideration for their age are the nave and the western half of the chancel. Now that the internal plaster is stripped off the chancel walls to half their height, a straight joint can be seen in the south wall some 20 ft. from the chancel arch, which marks the original termination to the east. Whether or not the church then ended in an eastern apse could not during the excavations be established, owing to the profusion of interments met with under the present floor, though an appendix to the book contains a good argument in favour of an apsidal termination. This point may be left in doubt while we turn our attention to the more vital matter of the age of the existing walling.

So long as only the exterior face of the walls was visible, though the chancel seemed of better workmanship than the nave, the masonry was so patched and irregular that it was hazardous to express an opinion about its date or dates. The inner face of the south wall of the chancel as now exposed reveals, however, brickwork of Roman type and regular technique, contrasting markedly with the walling of the nave, which is of rough stonework, with courses of Roman bricks at irregular intervals. This chancel brickwork corresponds almost exactly with that now visible at St. Pancras, both in the lower courses of the walling on the south side and in the north wall of the west porch, which is standing to a height of some 8 ft. This wall at St. Pancras is, perhaps, with one exception, the most Roman-looking bit of masonry in any ecclesiastical structure in Kent, or even in the Kingdom. The exception is to be found at the ruined church of Stone, near Faversham, where, in the western part of the chancel walls—best seen at the junction of nave and chancel on the south side—there is some excellent masonry of squared tufa, with regular bonding courses of Roman brick—the same materials and technique that are found in the Pharos at Dover Castle, a building often referred to in connexion with the questions under discussion. At St. Pancras brick alone is used, and the coursing is as regular as in many examples of classical work in Rome itself. The bricks are about  $\frac{1}{2}$  in. thick, and are set with joints of the same width of mortar. When a part of the foundations at St. Pancras was laid bare and the remains critically examined in 1881, the composition of this mortar was held to prove their post-Roman origin. It is white, and consists of shingle from the sea beach, containing fragments of shells, mixed with the lime. It has been since observed, however, that this same mortar occurs in undoubtedly Roman buildings in



Plan of St. Martin's, Canterbury. (From Canon Routledge's Book.)

Kent, as for instance in the Dover Pharos, where it is practically identical in composition with this at St. Pancras. The only evidence of a later date in the technique of the St. Pancras walling is the fact that the bricks are somewhat fragmentary, and in some cases show clear signs of having been re-used by the adherence to them of hard red mortar in which they had been laid in some previous building. These technical indications when taken together might be consistent with a late Romano-British period for the work, say the end of the fourth or beginning of the fifth century. The same date would serve also for the first construction of St. Martin's, if we accept Bede's testimony that it was a St. Martin's Church from its origin. Now one of the most interesting results of the recent investigations at St. Martin's is the discovery of evidence that the chancel walls once extended further west than their present termination at the chancel arch, and by leaving the nave out of account altogether, we should obtain in the extended chancel a simple chapel some 30 ft. by 14 ft., with perhaps an apsidal termination, constructed, so far as material and technique are concerned, almost exactly like St. Pancras. Such a building might well have been erected for Christian purposes soon after the death of St. Martin, at the same time that another stone church, with the same dedication, was rising under the hands of St. Ninian at the other extremity of Roman Britain, at Whiterne, in Galloway. Such a date for both the buildings under consideration would accord with literary records and with the evidence of technique, for there can be no question that the brick walling they exhibit is, like the work at Stone, quite a different thing from the much ruder imitation—Roman masonry of Saxon date at Reculver and at Brixworth.

The chief difficulty, and it is a grave one, in accepting this view of the buildings comes to light when we turn from technique to plan. The plan of the supposed original St. Martin's, *i.e.*, the present chancel extended further to the west but terminated in the other direction in an apse about 20 ft. east of the present chancel arch, would agree well enough with a date of about 400 A.D. It would be not unlike the plan of the chapel or crypt of St. Gervais above Rouen, which has been dated at about the end of the fourth century and is probably the oldest existing Christian edifice in Northern Gaul; and the plan of the apse, which cannot have been as wide as the space between the main walls, would also be of classical type. On the other hand, the plan of St. Pancras is by no means so classical, but presents features in common with Saxon buildings of the seventh and

eight centuries, and with some early Romanesque churches on the Continent. There is no space here to enlarge on the peculiarities of plan which St. Pancras shows in common with these early but not primitive buildings, and which are illustrated in Mr. Micklethwaite's recent paper on Saxon church building in the "Archæological Journal" for 1896. From the point of view of the development of plans from Early Christian to Medieval times there are undoubted difficulties in accepting for St. Pancras the early date that is indicated by its materials and technique. If St. Pancras, on the evidence of its plan, must be brought down to Augustine's time or later, this would naturally imperil the early date of the chancel of St. Martin's, which in construction is so nearly akin to it. It is true that, in such a Romanised region as Kent, technical processes may have continued for a considerable period of time without much change, and the two buildings may not be as nearly contemporaneous as they appear. Mr. Micklethwaite's view that the original St. Martin's, as described above, was built and dedicated in the time of Bertha, is so directly at variance with the explicit statement of Bede, that we must agree with Canon Routledge in putting it aside.

So far on the theory of the two buildings, St. Pancras' and the original St. Martin's. The nave of St. Martin's introduces us to a further difficulty. Viewed as they can be now on their interior faces, the nave walls seem much ruder in execution, and, accordingly, later in date than those of the chancel, but they possess certain peculiarities that have led some to claim them for a very early period. One of these features has been apparent for some time past, and consists of a patch of red plastering, visible near the little piscina at the south-east end of the nave. (Canon Routledge says that there are "considerable pieces" of this material behind the woodwork of the pews.) This plastering, made with pounded brick, is hard and of good quality, and might in itself be termed "Roman." The other feature was only displayed to view when the west wall of the nave was denuded of its plaster. There have come to light there marks of three openings which had been walled up; one, in the centre, is a large arched opening the object of which is problematical, and the other two are windows, splayed in the interior, the outer openings of which are permanently concealed by the walls of the mediaeval tower. These windows have jambs composed mainly of blocks of chalk and round heads turned in Roman brick, buried in abundant mortar. The peculiarity here is that this mortar is of the pink kind, composed in part of pounded brick, while



that of the walling generally is white. There would be no special significance in this but for the fact that precisely the same peculiarity occurs in the arched openings in the already mentioned Pharos at Dover Castle which are turned in mortar mingled with crushed tiles, while in the fabric generally the mortar is white. Is this merely a coincidence, or does it imply a special relation between the two edifices?

There will probably be more discussion before this question is settled, and all that need be said here is the following. The use of red plaster or mortar is not of itself evidence of Roman date, for there is red plastering of excellent quality on the floor of Reculver Church that is now accepted as of the seventh century, while red mortar is used in the walling of the interesting church of Vieux-Pont-en-Auge in Normandy, which, from the evidence of technique, as well as of an extant inscription, belongs to the same period. The correspondence with the Pharos in the change of the material for the window arches is no doubt striking, but the workmanship at St. Martin's is beyond all comparison ruder than at the Pharos. Whereas there the arches are turned in tiles, or in slabs of tufa alternating with tiles, with neatly-formed wedges of mortar quite thin at the intrados, at St. Martin's the tiles are imbedded at irregular angles in a mass of the red mortar, and the whole looks careless and thoroughly un-Roman in technique. The windows, but for the red mortar, do not differ from the many others of Saxon date where the head is roughly made up with Roman tiles, as at Swanscombe, Kent, or Arlington, Sussex. The general character of the windows as of the whole of the nave building is certainly Saxon rather than Roman, and this consideration seems to outweigh any evidence of early date that may be drawn from the curious coincidence already referred to. As the nave walls cannot be of a date anywhere near the Dover Pharos they may be accepted as seventh century work not necessarily as early as the time of Augustine's mission.

It will be seen from the foregoing that there is still plenty of room for differences of opinion about the date of St. Martin's. The church is undoubtedly a historical monument of national interest, and trouble spent on the study of it is not thrown away. The existing material on the subject of Romano-British churches is not enough to enable us to solve all the difficulties it presents, but this material may be increased at any moment by some fortunate "find." When the whole of the plan of St. Pancras can be laid bare, or when similar discoveries at Silchester come to be made on other deserted Roman sites, new evidence may spring to light that will enable us to settle some of these still outstanding problems. Till then the attitude of reserve maintained in this little St. Martin's book is the only judicious one. In taking leave of it may be worth mentioning that the illustration on p. 49 is wrongly lettered, "Looking East" should read "Looking West," while the incidental notice of the different kinds of Roman work on p. 46 should be re-written, with a reference to Middleton's excellent paper on the subject in his "Ancient Rome." *Opus lateritium*, for example, does not mean brickwork in our sense. *Lateres* are crude bricks; burnt bricks were *testæ*, and work in burnt bricks, such as we are familiar with, was *Opus testaceum*.

#### PROBLEMS OF MODERN INDUSTRY.



It is almost impossible to over-rate the value of the work done by Mr. and Mrs. Sidney Webb in giving opportunities for the public to consider many of the social and economic problems of the day. "Industrial Democracy" and the "History of Trade Unionism" have already been reviewed in these columns. There is now before us yet another book by these indefatigable and careful social observers, viz., "Problems of Modern Industry."\* It is a collection of essays and addresses, every one of which gives matter for thought and consideration.

There is one on the relationship between co-operation and trade-unionism which may well give rise to much consideration. Mrs. Webb in this essay takes two forms of co-operation—associations of consumers, which is the form of co-operation best known to the general public, and associations of producers; there are a few only of these, and their existence appears to be incompatible with trade unionism. Given such associations, there would be no room for trade unions, since the workers are their own employers (to put the position into words) and therefore the main reason for trade unions would be gone. But, in fact, such associations would bring about the very things which the modern trade unions oppose. There would, of course, be unrestrained competition, which "leads in bad times to the lengthening of the hours of labour of the associated producers and the reduction of their remuneration. Profit disappears, at any rate for a time, and it becomes a question of working longer and for less than before in order to avoid running at a positive loss and seeing their whole capital disappear. To resist this downward tendency and to insist on the loss being borne by the capitalist employer is just the function of the trade union to-day. . . . If this were absent the capitalist workers would find themselves driven in bad times to lower indefinitely their own standard of life in order to keep intact the capital which they had accumulated." As Mrs. Webb truly enough says in the next paragraph, we should then see a regular sweating system. It is obvious, therefore, that the ideal state of what may be called capitalised workmen, to which even yet some people look forward, is an impossibility. But the quotation which we have made suggests another remark. The writer of this essay, from which we are quoting, is an ardent believer in trade unionism, and it is admitted in the above quotation that the trade union must keep up a certain standard of wages, and let any loss fall on the capitalised employer. Such a system may be practicable as long as there is a considerable margin or balance of profit, so that there always remains some reasonable rate of profit for the employer. But the time may and does come when that margin becomes too slender. The function of the trade union on which Mrs. Webb insists then becomes incompatible with facts. Next there follow strikes, and equally certain defeat of the workmen, because if there is one thing more certain and obvious than another it is that employers will not use factories and coal mines and employ their capital only to fill the pockets of the workmen and empty their own. It is clear, therefore, that modern trade

\* "Problems of Modern Industry." By Sidney and Beatrice Webb. London: Longmans & Co. 1898.

unionism has destroyed one form of co-operation which had for a time a certain number of believers.

We now turn to the more common form of co-operation. And on this we may say that it is obvious that during the last few years its importance has decreased. At the present time, articles of consumption are sold at such low prices by the large dealers that, as every one knows, co-operative societies can give very little better terms. Indeed, in some respects they cannot give as good terms. Hence the necessity for and the importance of co-operative societies for the sale of articles of every day use has, in our opinion, decreased.

Mr. Webb points out that from a pecuniary point of view the results of co-operation are not nearly as valuable to the workman as efficient trade unionism. "The dividends of a co-operator amount on an average to about three pounds a year, or just about a farthing per hour on his wages. A 'good' co-operator dealing pretty constantly at the store will make perhaps double this amount or a halfpenny per hour of his working time. Now, I need not remind you how very easy it is to lose a halfpenny per hour in wages for the want of a strong trade-union. Take, for instance, the Amalgamated Society of Carpenters with its five hundred branches all over the kingdom. Their standard rates of wages vary from fivepence per hour in some towns up to ninepence halfpenny per hour in others—a difference equal to no less than eighteen times as much as the average co-operator makes out of his store." In addition, it must be pointed out that Mrs. Webb not only assumes a dividend, but also that the co-operator gets as good an article and at as low a price as he does at a shop, and leaves altogether out of account the question of credit when work is bad.

The long and the short of the matter is, however, that in Mrs. Webb's opinion, and she is no doubt quite right, the main object of the workman should be to see that he has a strong trade union rather than an efficient co-operative store. For if he keeps up his wages he will have plenty of money to spend.

Another point also which Mrs. Webb notes is this. She writes: "Co-operators must see to it that they pay in all departments the standard rate of wages in the district; that they work their servants for not more than the standard hours of labour in each industry; and, above all, that they give out no contract to any firm which does not observe the same conditions. These principles cannot be rigidly adhered to without close and frequent communication with the local trade union leaders; and it has been chiefly for want of such communication that a few co-operative stores have in the past unwittingly employed "rat-shop" printers or gone to "sweating contractors." But clearly here is a difficulty for co-operation and, in fact, it may almost be said that here again we see co-operation and trade unionism in antagonism. It is unpleasant, to say the least, for trade unionists to have their servants strike against them or be dissatisfied with their pay. It is equally unsatisfactory to find that their store is of no practical pecuniary value in the keen competition of to-day. It is equally clear that such positions may exist.

If we turn to another paper by the same writer, that entitled "How to do away with the Sweating System," we find much that is



useful. Mrs. Webb adopts the definition of sweating employed by the House of Lords Committee, viz., that sweating is "usually low rates of wages, excessive hours of labour, and insanitary work places."

Here Mrs. Webb puts an end to a popular fallacy. She denies that sub-contracts cause sweating. Some persons think "that in fact it is the middleman who is the sweater." But this is not so. Take, for instance, the furniture trades, in which all the evils of sweating exist. "We may watch the poverty-stricken maker of chairs, hawking his wares along the Curtain-road, selling direct to the export merchant or to the retail tradesman." Sweating, very largely in its worst forms, is carried on "by small masters in hidden workshops or by workers in their own dwellings." What is the remedy? Mrs. Webb answers, in effect, the enlargement of the Factory Acts. This would obviously deal with the two last elements of sweating—unhealthy work places and excessive hours; though as regards the latter, it is equally clear that no legislation can prevent a man who works alone from working for as long as he pleases. It can only prevent him from overworking his servants. Equally, also, the tendency for work to be done in large factories, where manual labourers can band themselves together in trade unions, is another blow to sweating, as also is the increase of machine work, since the latter must help to destroy home labour. In other words, the tendencies of the day are gradually putting an end to sweating. That the Factory Acts might be still further increased in their scope is, we think, pretty obvious. Mrs. Webb proposes, broadly speaking, "a double registration by landlord and employer of all places in which manufacturing work is carried on." As soon as you get to registration you get to inspection, so that the principle of the Factory Acts is extended from the factory to the house which is used as a factory.

It would be interesting to extend this article to a discussion of the essay on the reform of the Poor Laws, a subject of great importance to all manual workmen, though it is to be hoped that by proper and systematic working and support of benefit and other societies, the Poor Law may every year become a less serious question. At the present time the action of the existing Poor Law is to discourage thrift. "When a man is absolutely destitute we provide for him a bare subsistence. If he can manage to save by the time he is sixty-five as much as 150*l.*, he can provide for himself and wife practically as well as he and she would be provided for if they had saved nothing at all... anything short of that minimum is no use at all. Poor Law relief cannot be legally given except to the absolutely destitute." This states one of the main defects of our existing system very clearly: to have saved a little is worse than useless, and the man who has saved nothing is as well off as he who has saved quite a substantial sum. What reward do the thrifty obtain? How is thrift to be made to pay? These are questions which cannot be left long unanswered.

But it is a subject too great for mere casual notice; and we must rest satisfied with having called attention to some of the points raised in this work, which cannot fail to be read with interest by all who are concerned in the welfare of English workmen.

## NOTES.

The Proposed Gladstone Memorial. "Is Saul also among the prophets?" one might well ask on reading the report of Sir W. Harcourt's speech last week at the meeting of the General Committee for promoting a national memorial to Mr. Gladstone. We have certainly not been accustomed to look to Sir W. Harcourt for sound criticism, or indeed for any criticism at all, on points of æsthetics. But we must recognise that on the occasion referred to, at all events, he spoke words of wisdom in his contemptuous condemnation of the proposal to make an addition to Westminster Abbey in memory of Mr. Gladstone, which he compared with the idea of asking some modern writer to add a new book to the Iliad in memory of the deceased statesman's Homeric studies. We cordially hope, with Sir W. Harcourt, that the suggestion of the addition to the Abbey "may once for all be buried in oblivion." In regard to the proposed monument, also, Sir W. Harcourt was on the right side in expressing a hope that it would not be "a frock-coat statue." Sir John Mowbray, in seconding the resolution, contended that a statue should represent a man in the dress he was in the habit of wearing, and not in an ideal "drapery"; but neither speaker seemed to realise that there was no occasion to make a full-length statue at all, in order to produce an adequate monument to an eminent man. Let people take example by the way the French get out of the difficulty in many of their best monuments, giving a portrait bust or medallion only of the person to be commemorated, the rest of the monument consisting of an architectural composition adorned with ideal symbolical figures. Thus the whole thing is raised to the level of a work of imaginative art, the portrait bust or medallion just serving to connect with it the personality of the man commemorated, while evading the almost insuperable difficulty of treating a full-length modern costume figure in sculpture.

The recent criticisms of the *Morning Post* on the subject of the appointment of the architects for the new Government Offices have exhibited even more than the usual ignorance and bad faith of the London daily Press in matters of architectural criticism. The Office of Works having asked the Institute of Architects to send them a list of architects competent in Classic design, from whom they might select men who could safely be entrusted with the proposed buildings, the *Morning Post* in the first place made the gratuitous blunder of supposing that eight complete sets of designs for Government Offices had been sent in through the Council of the Institute, and that the selection of Mr. Brydon's design had been a piece of pre-arranged jobbery between the Council of the Institute and the Office of Works! After the plain truth had been told in a letter from the Hon. Secretary of the Institute, viz., that no plans had ever been made and no one person recommended by his Council, the *Morning Post* still persisted in its insinuations, while omitting to print Mr. Emerson's letter; it being part of the modern tactics of some daily newspapers to defer the printing of a reply to their remarks for two or three days, and then to apologise for the letter having been "inadvertently" omitted. Of course, this

kind of demonstration is not really made either in the interests of architecture or in the interests of the public; but it affords to the daily paper critic an opportunity of posing as an enlightened and virtuous enemy of jobbery; and if there is no real jobbery in the case, it is invented for the occasion.

We mentioned the other day the opening of the great new prison at Fresnes, a few miles out of Paris, which is to supersede the old prisons of Roquette, Mazas, and Ste. Pelagie. This vast establishment presents an aspect of gaiety and comfort which the inmates of many asylums or retreats for those who are not criminals might well envy. The buildings occupy an area of about 24,000 square metres, and have accommodation for about 2,000 prisoners. The *régime cellulaire* prescribed by the French law of June 5, 1875, has certainly been provided for with every consideration for attenuating its drawbacks from the prisoner's point of view. The cells are large, well-ventilated, lighted by electricity, and better furnished than many an artisan's room. The large open exercise-yards are made gay with grass lawns. Everything seems to be for the best from the humanitarian point of view; and, to crown all, official decorations have been lavishly bestowed upon the architect (M. Poussin) and others connected with the carrying out of the work. In fact, the opening of the new prison seems to have been quite a little holiday for all concerned, and promises to be almost as much so for the prisoners who are to have the privilege of occupying the building.

The L.C.C. Boundary-street Scheme. THE rebuilding scheme of the London County Council on Boundary-street area is now almost completed, and a perusal of some of the particulars prepared by the Housing Committee of the Council shows the extensive character of the scheme. Dwelling accommodation has been planned on the area for 5,380 persons, and adding to the 144 persons housed at Goldsmith-road re-housing accommodation has been planned for 5,524 persons, which is only 195 less than the number displaced, and 824 more than the scheme requires. In addition to this, eighteen shops and seventy-seven workshops have been provided. The 5,524 persons will be re-housed in 1,069 tenements making an average of 5.168 persons per tenement. The statistics as to the tenements are as follows:—One-room, fifteen; two-room, 541; three-room, 400; four-room, 15; five-room, seven; and six-room, three; while 601 of the tenements are entirely self-contained; and only thirty-five use water-closet and scullery in common with others. Every habitable room on the area is provided with a 45 deg. angle of light horizontally and vertically, and the buildings of which there are twenty-three separate blocks, are so arranged that nearly every room commands a pleasant outlook. The entrance avenue is 60 ft. wide, and all principal streets are 50 ft. wide.

Newgate Prison, and the Central Criminal Court. At their last meeting the Corporation agreed to a report presented by their City Lands Committee, in respect of the prison and its site. It was announced that the Home Office are prepared to co-



the male [*sic*] wing of the prison to the Corporation for a sum of 40,000*l.*, without requiring them to provide prison accommodation at Newgate, or extra cells at Holloway in its place, but recommending that some sleeping cells and a kitchen (for prisoners on trial) should be included in the plans for the new Sessions House, Old Bailey. The Corporation's plans are, it appears, still under consideration by her Majesty's Judges; the Secretary of State's offer, accepted by the Corporation, enables the latter to proceed with their project for rebuilding the Central Criminal Court upon an enlarged area. In our "Note" of October 31, 1896, we commented upon the plans prepared by Mr. Andrew Murray, City Surveyor; they could be carried out at an estimated cost of 120,000*l.*, and take in all the space now occupied by the Sessions House, the female wing (south) of the prison, the adjoining yard, and Nos. 10-1, Old Bailey; the male, also termed the debtors' wing, we may point out, is to the north (see Mr. G. J. J. Lacy's measured drawings and descriptive text in the *Builder*, December 21, 1895); and, for the Central Criminal Court, also by Dance the younger, and enlarged by Wm. Montague, and by J. B. Bunning, see our "Note" of May 9, 1896.

**Public Water Service, Bury.** THE sources and circumstances of the public water service provided by the Bury Corporation for the supply of the County Borough of Bury and certain neighbouring districts have been the subject of a Report to the Local Government Board, by Dr. R. Bruce Low. It appears that repeated complaints, some of them by the Health Authorities concerned, others by private parties, have been addressed to the Board as to the quality of the water supplied by the Bury Corporation. Dr. Low's Report gives reason enough why there should be complaints. The collecting reservoirs have been constructed in most instances by throwing a dam across a valley. The people resident upon the gathering grounds are engaged chiefly in agricultural pursuits. The water is not filtered before delivery to the consumers. On leaving some of the collecting reservoirs it passes through a copper wire gauze screen before it enters the mains; the larger solid particles contained in the water are thus prevented from passing into the pipes. But the screening, when practised at all, is insufficient. Occasionally, from exceptional pressure of the outflowing water the screen or strainer is ruptured, with the result that minnows, newts, and the like gain entrance to the mains, and create alarm or disgust in the minds of the householders when such unwelcome visitors are delivered from their taps. Occasionally smaller creatures, like the water flea, can be easily recognised by the naked eye in the water drawn from house taps. The greatest cause of complaint, however, is the occasional brown discoloration of the water, and the presence in it of a more or less thick sediment. The privy contents as well as the cow-stable manure are at certain seasons of the year spread upon the meadows sloping to the reservoir or its tributary streams. Some springs were seen issuing from the hillside not far below wet and open dung-heaps. Occasionally a rill flows through a farmyard unpiped, on its way to the reservoir, and

passes dangerously near uncovered dung-heaps and other filth. Much more is stated in the Report, but this is enough.

**Whitton Park, Hounslow.** THIS freehold estate is offered for sale, in one parcel of about forty-four acres, for building purposes. The mansion and pleasure-grounds are at present rented by the Whitton Park Club. The park and gardens were formed out of some cornfields skirting Hounslow Heath by Archibald, Earl of Ilay, who, in 1743, succeeded his brother as third Duke of Argyll. He built the house and laid out the property, making fish-ponds, a bowling-green, an orange-walk, &c., and planting a great variety of foreign trees and shrubs, together with larch, pine, cedar, and fir trees—some of the cedars he raised from seed, including the avenue of cedars, about 400 yards long, in 1724-6. In the conservatory (since converted into a separate villa) the Duke formed a choice collection of exotics, displaying a taste that was then uncommon in England. After the Duke's death, *s.p.*, in 1761, the estate passed through many hands, and was ultimately purchased by a Mr. Gostling, who divided it, taking the conservatory for his own residence, and selling the house with a larger portion of the grounds to Sir William Chambers, the architect. Chambers carried out some alterations in the house, and occupied it as his country-seat during several years. He erected in the grounds a Temple of Æsculapius, in compliment to the Rev. Dr. Willis and his successful treatment of King George III. in 1789, together with "ruins," a Roman bath, statues, and so on, and restored the tower, built by the Duke for his observatory. In the grounds was Cibber's group of the Highland piper and his dog, which commemorated a supposed incident in the Great Plague, related by De Foe, and was removed thence to Stowe. An old print depicts the gardens as in the Duke's time; a later view (1811) of the house was engraved for the "Beauties of England and Wales." In the tympanum of the angle-pediment of the main front was placed a bas-relief, executed by Dere, having for its subject the overthrow of the giants by Jupiter. On Chambers' death the two properties were acquired, and again united, by Mr. George Gostling.

**Light Railways.** MR. RITCHIE made an interesting speech last week on the subject of light railways at the cutting of the first sod of the Basingstoke and Alton line. He stated that up to the present time there had been 121 applications for orders under the Act; these applications represented 1,305 miles, and seven and a half millions of capital. Of course, some of these applications have already come to nothing, so that too much stress should not be laid on these after-luncheon statistics. At the same time, however, taken with some pruning they represent a great deal of real activity among promoters of these lines, and show that the Act has met a public want. There is no doubt that the cheapness of the construction of these lines has much to do with this. Mr. Ritchie stated that promoters had applied in 1895 for power to construct an ordinary railway between Basingstoke and Alton, and that it would have cost 36,000*l.* per mile, whilst the present light railway would only cost 5,300*l.* It is equally satisfactory to

know that to obtain the Order it was not necessary to spend more than 150*l.*, instead of the excessive amount which would have been incurred in legal expenses before a Parliamentary Committee. But the cost of obtaining Private Bills is a scandal.

**Electricity on the Underground Railways.** It is satisfactory to find that some practical step is about to be taken in regard to the use of electricity on the underground lines. It is announced in the annual report of the Board of the Metropolitan Railway, which will be under discussion at the half-yearly meeting as we go to press, that arrangements have been made for experimental working on a piece of line between High-street, Kensington, and Earl's Court Station. It is greatly to be hoped, however, that we shall not have to wait long for the experimental stage to end, and for electricity to come into general use on the London underground lines. Apart altogether from the question of electric traction, it would be highly desirable for the stations on these lines to be lighted with electricity. The condition of the lighting is now actually scandalous. In fact, there are many points, not great in themselves, but which all add to the comfort of the travelling public, which are now neglected by the managers of these lines.

**Designs by the late Sir E. Burne-Jones.** THERE are now to be seen at the South Kensington Museum, in one of the galleries of the South Court, three designs by the late Sir Edward Burne-Jones, Bart. Two of them were purchased at the sale at Messrs. Christie's on the 16th inst. The most important work is the design for the mosaic of the Tree of Life in the American Episcopal Church of St. Paul, Rome. This was painted in 1892, and the glass mosaic was produced by Salvati, of Venice, in the following year. The water-colour drawing of the symbols of the Evangelists, a design for portion of a stained-glass window at Castle Howard, was also acquired at the same sale. The third design is due to the liberality of Mr. C. Fairfax Murray, who presented to the Museum a model showing the scheme of the mosaic decoration in the apse of the same church in Rome. The subject represents the Heavenly Jerusalem. To the right are the three archangels Michael, Raphael, and Zophiel, and to the left the archangels Chemuel and Gabriel, the place for Azrael (or Azrael) being vacant. Above is a company of angels, and beneath are the four rivers of Paradise. The model has unfortunately been somewhat damaged in transit from Rome, so that the two figures, probably Zadkiel and Uriel, in the outside arches, are wanting.

**French and English Artists at the Mansion House.** It was a happy idea of the Lord Mayor, at the time when we have at the Guildhall such a fine exhibition of French Art, to take the occasion to bring together a number of French and English artists at a Mansion-House dinner "in honour of Art." And we observe that the meeting seems to have had the desirable result, among others, of suggesting to French artists (or those who spoke for them) that they ought to know more of English art than they at present know. The general public of this country, it is true, know little enough about French art—hence the value of the Guildhall exhibition;



but English artists undoubtedly know much more about French art than French artists know about English art. The French set up a cult of some particular English painter now and then (their last idol being Laurence), but they know very little about the works of our painters generally. Turner, for instance, is quite a stranger to them, and Millais was until the 1889 Exhibition brought some of his best works into prominent notice in Paris. Hence it is gratifying to find M. Dayot expressing strongly the wish that the English school should be well represented at the Paris Exhibition of 1900. Sir E. Poynter, in his speech at the dinner, referred once more to the recognised fact that the great modern French school of landscape owed its original inspiration to Constable, and the followers of our old master in landscape-painting are now our masters in that branch of art. On the other hand, in sea-painting we keep the lead at the present moment more than ever; the French have much to learn from us there, as they will probably admit if English sea-painters of the present time are adequately represented in the 1900 Exhibition.

The Proposed  
Monument to  
Balzac.

WE learn that M. Falguière has accepted the offer of the Société des Gens des Lettres to place the Balzac monument in his hands, and he hopes to have it ready for the centenary of Balzac's birth. It will be interesting to see how his work will compare with the eccentric production of M. Rodin.

#### THE ROYAL ARCHEOLOGICAL INSTITUTE AT LANCASTER.

The Royal Archeological Institute has this year been holding its annual meeting at Lancaster, under the Presidency of Sir Henry Howorth. The geographical position of the county town has restricted the excursions to the northern parts of Lancashire, but the interest of the places announced to be visited was sufficiently attractive to induce over 100 persons to attend the meetings.

The proceedings were opened at the Town Hall, at noon, on Tuesday, July 19, when the Mayor of Lancaster, Mr. William Huntington, wearing his gold chain of office, formally received the members of the Institute, and bade them a hearty welcome on behalf of the Corporation and his fellow-townsmen.

Sir Henry Howorth, as President of the meeting and the Institute, then took the chair, and delivered his address. He contrasted the past and present state of Lancashire, and showed how the county had risen from a sparsely populated and poverty stricken district to one of great wealth and prosperity through the discovery of coal and iron beneath the soil. He also passed under review the archeology of Lancashire, as illustrated by the traces of the Late-Celtic and Romano-British periods, the transient Irish Celtic invasion, and the strong Danish element still visible in the inhabitants and the names of the hundreds and villages. The absence of Pagan Saxondom was commented on, and the scantiness of the population was well shown by the few feudal castles and religious houses. A cordial vote of thanks was accorded to the President for his excellent address.

After an adjournment for luncheon the party reassembled in the old parish church of St. Mary, where its history was briefly described by Mr. W. O. Roper, F.S.A., and the architectural features by Mr. H. J. Austin. The church is a fine Perpendicular structure, consisting of nave and chancel, with aisles throughout, all with their ancient roofs; a south porch, and a western tower of good proportions but curious design, built in the Gothic manner about 1759. Traces of an older church may be seen in the Transitional-Norman south door; and the recent stripping off of some of the wall plaster has disclosed the jambs of a fourteenth-century west door of the nave, which shows from its position that the present church is not quite on the lines of its predecessor. Almost all the old

filings have been destroyed, but there are a good seventeenth-century pulpit and font, with its cover, and round the space within the altar rails is arranged a quantity of richly-carved fourteenth-century stall-work. This is not of the character usual in a parish church, and possibly it may have come from some adjacent monastery at the Suppression. Built into the walls of the vestry and north aisle are pieces of some ancient grave-slabs and early crosses. One of these, a very diminutive cross-slab, Mr. W. H. St. John Hope suggested might have covered the heart or entrails of a deceased warrior rather than the remains of a child, in the same way as the small effigies of bishops and knights of which examples are known.

A visit was next paid to Lancaster Castle under the guidance of Mr. Roper. This is now used as the county gaol, and much old work is hidden or has been destroyed by the erection of the prison buildings. The Keep is a fine and early example of the rectangular type, and although the interior is only partly accessible to visitors, there can be little doubt that it is the work of Roger of Poitou, to whom the site was granted by William Rufus. A fine drum tower of Norman date at the south-west angle of the enceinte, two other rectangular towers, and the imposing gatehouse, built, as the heraldry proves, between 1407 and 1413, are all that remain of the later defences of the castle.

In the evening the Antiquarian section was opened by the President, Dr. Robert Munro, Secretary of the Society of Antiquaries of Scotland, who delivered an address on the relation between archeology, chronology, and land oscillations in post-glacial times.

On Wednesday morning, in brilliant sunshine, a special train conveyed the party to Furness Abbey, where the ruins of the once wealthy and powerful Cistercian monastery were examined under the guidance of Mr. W. H. St. John Hope, who has lately carried out some extensive excavations on the site for the Cumberland and Westmoreland Archeological Society. The history of the abbey, so far as the buildings were concerned, Mr. Hope explained, was practically limited to the dates of its removal in 1127 from Tulket, near Preston (where it was first founded three years earlier), and its suppression in 1538. Of intermediate record there was none, and the story of the buildings could only be learnt from themselves. These showed that the first church had been entirely superseded, if it were ever completed or more than laid out, by another about 1170, to which the permanent monastic buildings were added by degrees during the thirteenth and fourteenth centuries. The various arrangements of the site and buildings were fully explained by Mr. Hope, who showed, from the directions for the Sunday procession and the documentary history of other Cistercian abbeys, that it was possible to assign to the different apartments their probable uses with some degree of certainty.

After luncheon the journey by train was continued to Peel pier, whence a voyage was made in boats to examine the remains of the ruined castle on Peel Island. This, Mr. Hope pointed out, was originally founded by agreement between the Abbot and Convent of Furness and King Stephen, who granted to the monks certain lands in Walney Island on condition that they built, sustained, and repaired a certain castle or fortress, known in later times as the Peel of Fouldrey, for the defence of the kingdom against the King's enemies. The existing keep is, however, of the middle of the fourteenth century, and is interesting as following the lines of a rectangular Norman keep, which it probably superseded. It is now ruined and partly fallen, but its arrangements can be easily made out, as well as those of the inner and outer wards, defended by walls and ditches with which it was surrounded. The state of the wind and tide unfortunately somewhat shortened the visit to these interesting remains.

In the evening the President of the Historical Section, Mr. J. H. Nicholson, President of the Lancashire and Cheshire Antiquarian Society, delivered the opening address, in which he dealt with the chief landmarks which successive occupants of North Lancashire had left behind them, and their association with the main features in history. A paper by Mr. A.

F. Leach, F.S.A., on the history of Lancaster School, was read, in his absence, by the Secretary.

Thursday was devoted to an excursion by road in beautiful weather, to the two famous halls of Bowrick and Levens. Bowrick Hall, which was described by Mr. W. O. Roper, is an instance of a fifteenth-century pele-tower to which has been attached an Elizabethan mansion, built for William Bindloss, a Kendal weaver. The date of this addition has been fortunately recorded on the top of the staircase by the builder, "ALIXANDER BRINSMEAD MASON 1595." The house is, unfortunately, not now lived in, and some of its rooms have been stripped of their panelling, but a lot of good old work remains untouched, including a room with curious painted decoration, perhaps original, and an apartment used as a chapel, and still retaining a wooden altar with sunk recess for the stone superaltar. The hall at Levens is not so interesting in some respects as Bowrick, owing to the "restorations" it has undergone, nor is it so good architecturally. But it is of the same type, and consists of an Elizabethan house built up round an early fourteenth-century pele-tower on the remains of a still earlier structure, of which there are some remains in the cellars. The moulded plaster ceilings and frieze in the hall and other rooms are well worthy of notice. In the usual absence of Captain and Mrs. Bagot, the members of the Institute were received by Mr. Bagot, and a brief history of the house was given by Mr. J. F. Curwen. After an inspection of the interior of the mansion, which was freely thrown open to the visitors, a move was made to the famous garden, perhaps the most perfect example now left in England of the formal Dutch type with clipped hedges and trees, known as topiary work. Levens Garden was laid out after 1689, for Colonel Grahame, who then owned the property, by Beaumont, the Frenchman who made the alterations in the Hampton Court garden for Charles II. The Dutch model on which the Levens garden is formed may account for some of the trees being clipped into the shape of case bottles of Hollands! Besides the Dutch garden, there is a delightful bowling green and kitchen garden, and on the other side of the house is a charming rosary. The return journey to Lancaster was made through Yealand Conyers, where Mr. and Mrs. W. O. Roper hospitably entertained the party to tea.

In the evening the Architectural Section was opened by its President, Mr. J. T. Micklethwaite, V.P.S.A., who gave an address on some recent additions to the examples of early church architecture of the Saxon period. The Rev. W. S. Calverley, F.S.A., also communicated a paper on some early crosses and pre-Norman fragments, which was read in his absence, through illness, by Mr. Mill Stephenson.

Friday morning was occupied for the most part by the annual business meeting, for members of the Institute only. The place of meeting for next year was discussed, Ipswich being a centre that had many advocates; but the matter was ultimately referred to the Council. At a meeting of the Antiquarian Section, which followed, a paper by Lord Dillon was read on some mediæval armour.

In the afternoon a visit was paid by road to Heysham, where the Rev. W. S. Calverley, F.S.A., was to have described the crosses, hog-back stone, church, &c. In his absence, the principle features of the crosses, &c., were pointed out by Mr. Nicholson, and the architectural history of the quaint parish church was explained by Mr. Micklethwaite. The nave of the church is claimed by many as early Saxon. This Mr. Micklethwaite said, was probably true as regarded the west wall, and parts of the masonry of its south and east walls, but the chancel arch, with its singular rope-like impost, he thought, belonged to the seventeenth century, when the fifteenth-century south aisle was lengthened and largely rebuilt, and an addition made on the north of the chancel. A north aisle has lately been added, and the south aisle extended as far as the east end of the chancel, thus enclosing the old side windows. A move was next made to the ruined chapel and burial-place on the bluff to the west of the church. This remarkable little building, which was only 8 ft. 6 in. wide and about 26 ft. long, was dedicated in honour of St. Patrick, and it is not as early as his time, is clearly a structure

\* An account and plan of Furness Abbey appeared in the *Builder* for July 6, 1895. We understand that Mr. Hope is preparing for the Cumberland and Westmoreland Archeological Society a full account and new plan of the Abbey, based on the discoveries made since our former account.

\* For further particulars of the house, see the *Builder* for August 21, 1897, p. 147.



of considerable antiquity. Its plan and other features are suggestive of its being the work of some settlers from Ireland. The rock-cut graves that are visible in the enclosure attached to this little sanctuary appear to date from the thirteenth century. There are others now hidden by the turf.

From these interesting relics of early Christianity a visit was paid to Heysham Old Hall, an Elizabethan mansion not unlike Borwick in its main features, built in 1598. Tea was here provided through the kind hospitality of the Rev. C. T. and Miss Roys. In the evening a conversation was held at the Town Hall by invitation of the Mayor of Lancaster. During the evening the ancient charters of the town, beginning with that granted by John, when Earl of Moreton, in 1193, were exhibited and described by Mr. Roper; and a paper was read by Mr. T. C. Hughes, town clerk, on the municipal insignia. These, which comprise a great mace, *temp.* Queen Anne, two sergeants' maces, and a mayor's staff, were also exhibited, together with the town's plate and a fine series of Elizabethan weights and measures.

On Saturday morning a special train conveyed the members to Grange, where carriages were in readiness, after luncheon, for a drive to Cartmel. Here the priory church was inspected under the guidance of Mr. Hope. The church was shown to have been both monastic and parochial, the choir and its aisles, with the central tower and transepts, having formed the conventual church of a priory of Black Canons, established at Cartmel in 1188, by whom they were built, while the present fifteenth century nave and aisles were used by the parishioners, who had previously owned the church. Mr. Hope also showed that the Canons' cloister and monastic buildings had originally been placed on the south side of the church, but subsequent to the erection of the north transept, &c., they were transferred to the other side, where they remained until the end. At the Suppression the monastic part of the church, which was screened off from the parish part, was stripped of its lead covering, and partially unroofed. It otherwise remained intact until about 1620, when George Preston, of Holker, then holder of the priory lands, put on new roofs, and made over the conventual part of the church to the parish, which thus became possessed of the whole building. To Preston's munificence is also due the splendid canopies and screenwork added to the old fifteenth-century stalls, as well as other pieces of furniture that have been destroyed at "restorations." The Harrington and other monuments in the church, the interesting remnants of painted glass, the library and parish umbrella, were also inspected, and some of the party ascended to the belfry to view the manner in which the quaint upper story of the tower is set on huge squinches resting on the crowns of the arches. After a visit to the fourteenth-century gatehouse of the priory, all that remains of the monastic buildings, the members drove back to Carn Station and thence by special train to Lancaster.\*

#### BRITISH ARCHEOLOGICAL ASSOCIATION'S CONGRESS, PETERBOROUGH.

The fifty-fifth annual Congress of this Association commenced very auspiciously on Thursday, July 14, under the Presidency of the Lord Bishop of the diocese. Favoured with beautiful weather, a large party of members and visitors assembled at 2.15 beneath the lantern tower of the Cathedral, where at 2.30, they were welcomed by the Dean and members of the Chapter. The proceedings of the Congress were then commenced by the Dean, Dr. Ingram, giving a very interesting address upon the history of the grand old fane. The history of the monastery is recorded in "Swaffham" by Hugo Candidos, and by Waltheo of Wiltlessea, and others. The Dean, referring to these writers, said that Penda, King of Mercia, had three sons and two daughters, the former named Peda, Wulfere, and Ethelred, the daughters named Kyneburga and Kyneswitha. About fifty years after the death of St. Augustine, Penda the king died, and was succeeded by his eldest son Peda, who had been some time a Christian and had as his adviser a Christian priest named Saxulf, who afterwards became first Abbot of Peterborough and, later, succeeded St. Chad in the Bishopric of Lichfield. Peda, being desirous of building a church and founding a

monastery to the glory of God, took counsel of Saxulf and by his advice a site was selected near to the edge of the great marsh or fen and close to the River Nene; this spot was called at the first Medehamstede, the homesied at the first, but afterwards Peterborough. Here, then, the erection of the first Saxon church was commenced about the year 656 A.D. The murder of Peda at the instance of his Queen four years later; the accession of his brother Wulfere, who had relapsed into heathenism; and his murder of his sons because they had embraced Christianity, were circumstances which delayed the progress of the building, and the first church was not completed until about 680 or 690 by the youngest of the three brothers Ethelred and his sisters Kyneburga and Kyneswitha. This building was entirely destroyed by the Danes in the year 870, when the Abbot Hedda and all the monks were slain, and the site of the monastery lay desolate for ninety-six years. About the year 970 the re-edification of the monastery and the rebuilding of the church were completed by King Edgar, and the foundation walls of this second Saxon church, built upon a portion of the site now occupied by Peterborough Cathedral, may be seen beneath the pavement of the choir and south transept by those who do not mind some little inconvenience in getting down to them. Readers of the *Builder* will remember that a plan of the Cathedral was published in our issue for April 4, 1891, which indicates very clearly the position of the Saxon walls. About the year 992 Abbot Kenulph surrounded the monastery with a wall, and a portion of this wall has quite recently been discovered in excavating for the underpinning of the north eastern angle of the "new work." The first Norman Abbot of Peterborough was Thorold, or Turolf, in 1069, when the Abbey was raided by Hereward the Wake. The second Saxon church lasted until 1116, when, through carelessness, it was entirely destroyed by fire. The existing building was commenced in the year following by Abbot John de Sais who built the present choir. The Dean observed that the continuity of the Norman architecture in the church is due to the fact that during the eighty-two years the building was in progress, each successive Abbot, whether he did much or little, followed the design and intention of his predecessor. The west front was completed by 1238, and five Abbots bore rule during its erection, but no one knows to whom the credit of its design is due. The chronicles make no mention of it, which is certainly extraordinary, considering that the building works carried out by other Abbots are described.

At the conclusion of the address the Dean conducted the party round the Cathedral, pointing out and describing all the chief features of interest in the building. With reference to the so-called Abbot's Stone, which is thought to indicate the spot where the murdered monks were buried, the Dean considered the evidence was in favour of its genuineness. The painted ceiling of the nave was probably painted by the monks about 1170, and is, he believed, the oldest wooden ceiling in England. Passing round the church to the west, the Dean observed that the nave of the church was completed from the central tower to the second bay from the present west wall by Abbot Benedict in the seventeen years of his rule, from A.D. 1177, and he pointed out the indications in the piers and in the triforium, which seem clearly to show that it was originally intended to terminate the church with a Norman west front and flanking towers. Arrived at the western front, the object recently of so much adverse criticism concerning the works of reparation which have been carried out to the north-west gable, the Dean remarked that of the 2,000 stones taken down it was found necessary to renew only 170, and most of those were hidden from view. Under the careful and painstaking supervision of that conservative archaeologist, Mr. Irvine, the clerk of the works, every stone was measured, numbered, and replaced in its original position, otherwise untouched, and the whole gable is now made perfectly secure. Many of the lay members and experts in works of reparation, some of whom had previously inspected the unsound condition of the gable, ascended the scaffolding and carefully examined the work that has been carried out. The general opinion was that no more has been done than was absolutely essential for the preservation of

the fabric, and that the work has been done in the only possible manner to secure for posterity this magnificent example of Early English architecture. In fact, the appearance of the gable—to all unbiased beholders—is a sufficient justification of the extreme care and reverential regard with which it has been treated. Before leaving the cathedral many of the members of the Congress visited the library, which is preserved in the large room built over the central porch in the latter part of the fourteenth century. Here Canon Alderson exhibited some rare books, including the famous "Swaffham MS.," the only remaining Benedictine book. After two hours spent at the cathedral the party adjourned to the palace, where they were invited to a reception by the Bishop and Lady Mary Glyn at 4.30. In walking round the charming gardens of the palace, one comes upon several quaint bits of the old monastic buildings built up in the modern houses comprising the Bishop's residence. It would be of great assistance to the identification of these buildings if a complete and accurate ground plan were made of the whole of the existing buildings of the monastery. The late McKenzie Walcott's plan is the best, but it is far from complete.

In the evening a largely attended meeting was held in the assembly-room attached to the Grand Hotel, when the President, the Lord Bishop, gave his inaugural address, the Mayor of Peterborough being in the chair. The Bishop expressed his great appreciation of his appointment as President, although he could lay but little claim to be an archaeologist. He eulogised the work this and kindred associations were doing in the formation of character. The young country had no past from which to draw the lessons of to-day; and America, for instance, would give a large slice of her national wealth for such a treasure house of archaeology as England possessed. She knew what an influence this was in making character and forming men. The Bishop dwelt at some length upon the community established in the seventeenth century at Little Gidding, and the work carried on there by Nicholas Ferrar and his family. At the conclusion of the address, a paper was read by Dr. Walker upon the Roman occupation of Peterborough and the District. He said: Many remains of Roman forts have been found in the valley of the Nene. The Roman town of Durobriva was of British origin, developed and improved by the Romans. The Roman road from Leicester, the Ermine street, passed through Peterborough, and its direction is easily traced now by the colour of the crops. British roads existed in this district before the Romans, and in the roads made many years afterwards Roman pottery and kilns are found in abundance. No public buildings have been discovered at Durobriva, only remains of private dwellings, and no Roman buildings have been met with in Peterborough itself within the past sixty years.

The walls of the Assembly Hall were hung with engravings, drawings, and other illustrations of the places of historic interest in the locality to be visited by the Congress during the week, and quite an extensive museum of local antiquities was arranged in cases for the inspection of the visitors by Mr. Bodger, one of the local hon. secs., and remained on view throughout the week, adding greatly to the interest of the meeting.

#### Friday.

Members and visitors, forming a large party, left Peterborough in carriages about 9 o'clock for Barnack, where they arrived about 10.30 after a pleasant drive in lovely weather. At the ancient Saxon church the Rev. Canon Syers met the party, and after pointing out the special features of architectural interest externally, read a paper upon its history. There are five distinct periods of architecture in this ancient edifice. The tower is a well-known example of Saxon work. The foundation of the church is attributed to Wilfrith, Archbishop of York about the year 670. The curious emblematical carvings inserted in the walls of the tower, which are regarded as evidence of Wilfrith's association with the church, were examined with much interest. The exterior walls of the church and the north arcade are of Norman date, and in the opinion of the Canon bear a Continental character. Norman tendencies are to be found in the grooves for glass, the drip blocks to labels, and in the large number of windows. The original Saxon nave was

\* Our report will be concluded next week.



of wood. The remarkable tower arch was blocked up until 1855, when the late vicar, Canon Argles, opened it out and found the original floor of the Saxon tower, with the stones deeply worn by the feet of the passing worshippers. It was also then discovered that the foundations were laid on the debris, ashes, and molten lead caused by the burning of the old Saxon church by Sweyn in 1013. Mr. Irvine is of opinion that the builder was Queror, A.D. 1080. The south arcade is of Early English work. The font dates from about 1250. The chancel is of the Decorated period. The Lady Chapel, at the east end of the south aisle, is of the Perpendicular period, and bears interesting evidence of the exhaustion of the Barnack quarries at that date, *temp.* Henry VII., as the piers of the arch up to the capitals are of Barnack stone, but the arch itself is of a stone of a different character. In a niche in the south chapel is a very unusual example of the sculptured representation of the Blessed Virgin and the descent of the Holy Ghost. Many ancient coffins, some of which have been preserved, have been unearthed in digging for graves in the churchyard.

The drive was continued to Wittering, where the ancient church was described by Mr. C. Lynam, F.S.A. He said at Barnack was to be seen the tower of a Saxon church, but at Wittering was a Saxon church itself—nave and chancel up to the east wall all being Saxon. Long and short work was clearly visible at the north-west angle of the nave and at the angles of the east walls too. The chancel arch was very rude and undoubtedly Saxon. The church was considerably smaller than that at Barnack, and in his opinion was of early Saxon date. Wansford Church was the next visited, and here Mr. Lynam again pointed out the chief features. This is a church without a chancel, consisting of a nave and north arcade only and western tower. The chancel has been destroyed. There are remains of Saxon work in the shape of a window in the west wall. There is a good Norman doorway inside the south porch, the porch itself being a late addition, and bearing its own date, 1663. The church is said to have lain in ruins for many years, but in 1662 was repaired and used for divine service. The tower is Early English, and has an unusual treatment of the mullions of the windows, and that at an early date, to preserve it from destruction. It is in a very dilapidated condition, with large cracks running up the entire height of the west face. In the churchyard are several coffin lids which are said to have been brought from Sibberton Priory, a short distance away. Half an hour's drive brought the party to Castor, the Roman Durobrive, where the fine Norman church was described by Mr. Traylen, of Stamford. He said the district around Castor was saturated with evidences of the Roman occupation. The outward appearance of the land now was pretty much what it was in Roman times, but a flourishing city existed here when all else had vanished. Foundations of a Roman temple had been found, and many coins, tiles, &c., and masonry, but no altar of any kind. In A.D. 650 the Kingdom of Mercia embraced Christianity. There are no remains of the church of St. Kynesburgha except the small portion of sculpture over the south porch, but in Castor Field there was a balk named after her. She founded a convent at Castor, and built a church, about 650. Here she died and was buried, together with her sister, St. Kyneswitha. The church is cruciform in plan. It was rebuilt, with the exception of the tower, in the thirteenth century. The tower is, of course, well known to architects as a fine example of enriched Norman work. The parapet and spire are of the fourteenth century. The curious paintings on the north-west wall, which represent the Church militant, the Church in purgatory, and the Church triumphant, attracted much interest. The colours used in these curious paintings are the same as are found in similar paintings in other churches in the neighbourhood, and the character of the decoration generally favours the supposition that they were all painted by the same artist.

At Milton Hall, the next place visited, many rare objects of historic interest were inspected, including the portrait of James I., given to Sir W. Fitzwilliam by Mary Queen of Scots the night before her execution, and the watch which belonged to the unfortunate queen. At the

evening meeting the Rev. P. Royston read a paper upon Orton-Longueville Church. Mr. Thos. Blashill, Hon. Treasurer, occupied the chair. The church is dedicated to the Holy Trinity, and dates from about 1330. On each side, externally, of the south-east window is a niche with trefoil head and mouldings, which was considered by Paley to have been the sedilia removed from within; but Mr. Royston was of the opinion that it was in its original position, and in this view Mr. Irvine coincided. There is a low side window of three lights, and adjoining it on the inside is a stone seat, and a similar seat on the north side of the chancel arch. The south aisle is said to have been built from the materials of the demolished church at Botolphsbridge, which parish was united with Orton in 1721. Beneath the north chantry arch is the recumbent effigy of a cross-legged knight, with a circlet cloak worn over the armour. In the tower is a curious chamber, which had been examined by Mr. Irvine, but he was unable to explain its use. The paper was read in anticipation of a visit to the church on Thursday, the 21st.

#### Saturday.

This day was devoted entirely to the exploration of the ancient town of Stamford, with a visit to Burghley House in the afternoon. The party reached Stamford about 9.40, and were met at the railway-station by Mr. J. C. Traylen. The weather was very dull at starting, but the day turned out fine and intensely hot. On the way to St. John's Church, across the meadows, Mr. Traylen indicated the positions of the ancient castles, and gave a general description of the town in Mediaeval times. Arrived at St. John's, Mr. Traylen gave an epitome of its history. The richly-coloured hammer-beam roof of the nave, with carved figures representing the heavenly choir, the parclose screens, and remains of painted glass of the Perpendicular period in the upper lights of the north aisle windows were pointed out, and a move was then made to All Saints' Church, where Mr. Traylen discoursed upon its history. All Saints is well known to most architectural students, and has often been described. The church belongs in great part to the first quarter of the thirteenth century, but its present appearance is due to the large amount of rebuilding and restoration it underwent in the fifteenth century, caused by the great damage it suffered from the Lancastrians during their occupation of the town. William Browne, a prosperous wool-stapler, restored the church between 1480 and 1490. He was the founder of the celebrated hospital a short distance away, and, together with his wife, lies buried in the Early English chapel of St. Mary; and a fine brass, but with the canopy partly gone, marks their resting-place. He also built the fine spire which is illustrated in Wicket's "Towers and Spires." Following Mr. Traylen, the party visited Browne's Hospital, where they much admired the beautiful screen in the chapel, so well preserved; they also noticed the original altar slab with the five crosses intact, which now forms the floor of the altar. It is one huge slab of stone, about 11 ft. in length. An ancient fifteenth-century "cope" chair attracted much attention. There are ten bedesmen resident in the hospital at the present time. St. Leonard's Priory was the next place upon the programme, but, owing to it being situated nearly a mile away on the Uffington-road, and the great heat combined, it was decided to forego the visit and stroll leisurely through the picturesque streets of Stamford Town. St. George's, St. Mary's, and St. Martin's were all visited, but a very short time was devoted to St. Mary's as the chancel and side chapel gates were locked and permission to enter was refused, the visit of the archaeologists, seemingly, being resented as a desecration. After luncheon, carriages were in requisition to convey the party to the celebrated mansion of the Marquess of Exeter, Burghley House. Here Mr. J. A. Gotch, F.S.A., read a very able and interesting paper, in the Great Banqueting Hall, upon the history of the house, the paper being illustrated with plans, by Thorpe, of the original building, and many large maps and engravings. The history of the Manor of Burghley goes back to the time of the Conqueror, when it was possessed on lease by the King's Chaplain, at whose death it was seized by the Crown. Leofric, the Abbot of Peterborough, redeemed it, and Pope Eugenius in 1141 confirmed it to the abbey. The manor then

came to be held of the Abbey in the reign of Henry III. by William de Burghley and Thomas de Burghley, and, passing through several families, by purchase it at length came into the possession of Richard Cecil, the father of the great Lord Treasurer Burghley, about 1528. An old house belonged to the Lord Treasurer and occupied a portion of the site of the present mansion, which seems to have been commenced about the year 1575. The date 1577 is carved in relief in the centre of the vaulted ceiling of the west entrance, while 1585 and 1587 respectively are carved beneath the spire of the chapel and upon the north front. After listening to Mr. Gotch's lucid description of the building, the party viewed the stately rooms and galleries, rich with fine old tapestries, paintings, and carvings and cabinets filled with rare articles of vertu, and then returned by train to Peterborough.

At the evening meeting Mr. C. Dack, hon. local secretary, read a paper upon the Peterborough Gentlemen's Society. This society is one of the oldest in England, and although its original intentions have been altered several times yet after a period of nearly 160 years it still exists. In its earlier history it is very much associated with the Spalding Gentlemen's Society, which was founded in 1712, by Mr. Maurice Johnson, the secretary of the Anti-quarian Society, and is still carried on under its original rules. The founder of the Peterborough Society was the Rev. Timothy Nene, an original member of the Spalding Society. Amongst the original members was the Rev. Robert Smyth, a learned antiquary and curate of Woodston, who wrote a history of Huntingdonshire, which was never published. He also copied inscriptions and epitaphs in the counties of Northamptonshire, Hunts, Cambridge, and Rutland, and Lincolnshire, including a list of those not mentioned by Browne, Willis, and others in Peterborough Cathedral. The Society was founded in 1730 "for the improvement of literature and promotion of friendship and good neighbourhood." The minute books for the first twenty years were kept with great care, and many interesting records are preserved therein, but after 1752 the entries are very irregular. The Society still exists, but now takes the form of a limited circulating library.

#### Monday.

An early start was made by train for Spalding. Here the party was met by Dr. Marten Perry, the President of the Spalding Gentlemen's Society, and Mr. Ashley Maples, the Treasurer, and under their guidance proceeded to inspect the ancient Church of S.S. Mary and Nicholas, which, from its known history and the completeness of its plan, is of considerable interest. Dr. Perry gave some account of the church, which dates from 1284. The church was the outcome of a contract between the Prior and Convent of Spalding and the parishioners, by which the latter contributed roof, and the former built the church on the site of the cemetery. The stairs of the roof loft remain in perfect preservation, and the screen dates from 1350—it was restored by the late Sir G. G. Scott. The chapel on the south side of the chancel is dedicated to St. Thomas-a-Becket, and was a gulfed chapel, erected in 1315. In 1360 the aisle of the transepts were widened. The south porch dates from 1500, as does the curious arch thrown diagonally across from the south aisle to the junction of the south transept with the nave. In the vestry are preserved some early printed books, including a Commentary by Nicholas de Lyra, dated 1498; a Bible, 1537; a French Bible, 1617; and a copy of Foxe's "Martyrs," 1631. From the church the party went, under the guidance of Dr. Perry, to Ayscoughlee Hall, which was built about 1420 for Sir Richard Aylwyn, father of Sir Nicholas Aylwyn, who was Lord Mayor of London in 1509. It derives its name from the family of Ayscough, or Askew, of whom Anne Askew was descended. The celebrated Maurice Johnson, the founder of the Spalding Gentlemen's Society, lived here in 1710. Spalding possessed three guilds, and several ancient stone coffin-lids, found on the site of one of these guilds, are built upright into a modern wall for preservation. Dr. Perry then conducted the party to the Church Cote near St. Peter's Church, where they were invited to attend the quarterly meeting of the Spalding Gentlemen's Society. He here read an interesting paper upon the "Origin, Progress, and Present State of the Society," which



it appears, is the oldest antiquarian society in the Kingdom, having been founded in 1711. The first entry in the minute-book is under the date 1712. The Society possesses many valuable MSS., amongst others the Register of Spalding Priory, containing many pedigrees of the fifteenth century, its date being 1450. A second paper was read by Mr. Ashley Maples in the absence of the author, Mr. W. E. Foster, F.S.A., on "A Plea for the Preservation of Manorial Court Rolls." A visit was afterwards paid to the museum at the Johnson Hospital, where the ancient MSS., &c., &c., were laid out for inspection. Returning to Peterborough early in the afternoon, the parish church of St. John the Baptist was inspected, and a paper descriptive of its history was read by Mr. H. M. Townsend. This church originally stood eastward of the minster, but the parishioners, complaining of the distance, and that they were often prevented by the waters from attending the services, the Bishop of Lincoln gave his licence for its removal. The church was rebuilt at the charge of the parishioners, but the Abbey gave towards the work the nave of St. Thomas-a-Becket's chapel, the chancel of which is now used as the Peterborough Museum. The new church was completed in 1407. In the vestry are preserved some rich examples of old embroidery and a large full-length portrait of King Charles I. Some of the members paid a visit to the ancient Tithe Barn, in which only the skeleton now remains, it having recently been sold by the Ecclesiastical Commissioners, so the members were informed, to the great regret of the Dean and Chapter; the inopportune interference of a certain society in the matter, it was explained, had complicated the negotiations and had been the ultimate cause of the loss of this interesting and almost perfect building. At the evening meeting the following papers were read:—By Lord Melville, on "Latham Hospital and its Early Statutes"; by Canon Rawnsley, on "Caedmon, the Saxon Poet"; by Dr. Phené, on "The Commercial Position of Peterborough and District in Pre-Roman Times."

#### Tuesday.

Leaving Peterborough in carriages about 9.15, Glatton Church was reached about 10 o'clock. The church, dedicated to St. Nicholas, is cruciform, and dates generally from about 1460, but there are remains of earlier work of the twelfth and thirteenth centuries. The screen is of the middle of the fifteenth century. There is an early low side window of two lights. The old open benches have some well-carved poppy-heads. One peculiar feature of this church externally is that the clearstory stage is carried along the two sides of the tower. The drive was resumed to Little Gidding, where the quaint and exceedingly interesting little church was inspected, and the Rev. A. Hilton read an admirable paper upon it and the religious fraternity established here by Nicholas Ferrar in 1625. After resigning his seat in Parliament and giving up public life, Nicholas Ferrar retired here, together with his mother and brother, his sister and her husband, family, and servants, forming in all a community of over forty persons, and they lived a life of strict devotion and religious seclusion. This establishment at Little Gidding, Mr. Hilton said, may be called a place of beginnings, for the monastic life, as divorced from the religious life of the Church of Rome, had its beginning here. Concordances also had their beginning here. The fame of the community soon spread, and many good men and women visited the place, amongst them the saintly Herbert, Dr. Donne, King Charles I., and others, until at length the place was ransacked and destroyed by the Parliamentary troops. Ferrar died in deacon's orders in 1634. "He was a Puritan and yet a Catholic, and a Catholic and yet a Puritan." The curious church has been restored to its appearance in Ferrar's time. The seats are arranged stall-wise along each side of the church, and possess good carved canopies of the period. There is a brass eagle lectern, which was discovered in a pond, where it had been thrown by the despoilers. The font is of brass, and very curious, with a cover and cresting resembling a crown, intended, it is said, to be emblematic of Church and State—the font the Church, the cover the State. Conington Church and Castle were next reached. The church is a fine structure of the Perpendicular period. In the south chapel is preserved an abbot's chair, formerly belonging to Peterborough. It is said to have been

brought from Fotheringhay, where it was used by Queen Mary just previous to her execution. In the church is a remarkable effigy of a knight in chain armour of the time of Edward I., over which is a friar's sleeved cowl, with hood and cincture of knotted cord. Nothing is known as to its history. Mr. Patrick, hon. sec., read some extracts from old documents, and pointed out the chief features of the church and the celebrated monuments to the Cotton family. The adjoining mansion, called Conington Castle, is said to have been built of the materials of Fotheringhay Castle, and certainly the columns and arches surrounding the lower story are of the Perpendicular period.

The carriages were resumed, and about half an hour's drive brought the company to Yaxley, where the Rev. W. E. H. Brown and Mr. Townsend described the church, which is a cruciform structure with a fine tower and lofty spire at the west end. The dates of the architecture are from 1240 to 1260 for the north aisle of chancel and chancel arch. The chancel window and south aisle are about a century later. An interesting feature is that the roofs all over the church are quite original. The rood screen has very good details, although late, about 1480, but the beam is wanting. The nave and aisles were rebuilt about 1340. The tower is within the church. Preserved in the church are the curious iron tongs called the "fire-engine;" they were used to pull down the thatch from burning roofs to prevent the fire spreading. Some remains of colour decoration are visible in the south respond of the chancel arch and on the lower panels of the screen. Another interesting feature in this church is the memorial of a heart burial in the north transept. It is that of an abbot of Thorney, William de Yaxley. A former vicar disinterred the case which contained the heart, which crumbled into dust on exposure to the air; but the case is preserved and was produced for the inspection of the members of the Congress. On the way back to Peterborough a short halt was made at Fletton in order to see the ancient cross, said to be Saxon, now standing in the churchyard. Mr. Lyman, in describing the cross, said it was distinctly Norman and not Saxon. At the evening meeting Miss Edith Bradley read a paper upon "Crowland and the Legend of St. Guthlac," which was illustrated by lantern slides. A paper was also read by the Rev. W. D. Sweeting on "Maxey Church and Parish."

#### Wednesday.

Leaving Peterborough about 9, a drive of an hour's duration brought the party to Woodcroft Manor House, situated in the parish of Elton, about seven miles from Peterborough. It is called a castle, but it does not appear to have been a place of much strength, or to have possessed, beyond the moat, any particular means of defence. It is, however, a valuable and most interesting example of a country house, dating partly from the thirteenth, but mainly from the fourteenth centuries, erected, probably, during the reigns of the two first Edwards. In plan the house is a parallelogram, with an attached circular tower of three stages at each of the two front angles (only one now remains); the entrance is beneath an arched gateway in the centre of this front, the wall being carried up to form a square tower, against the sides of which the high pitched roof abuts. The windows which light the lower story are small and square-headed. The building is in two stories, the upper one originally being open to the roof, and the windows on this floor are larger, and are divided into two lights by a moulded transom, the upper lights being square-headed trefoils. The entrance gateway has no signs of a portcullis, but has a room over it said to have been an oratory. The house is at present undergoing considerable alteration to fit it for the occupation of the new proprietor, and a third story is being added which does not improve the appearance of the old building. This house was attacked by the Cromwellians in 1648, and was the scene of the tragic death of Dr. Hudson, which circumstance Sir Walter Scott related under the name of Dr. Rolfe in his romance of "Woodstock." The drive was resumed to Maxey, stopping on the way to inspect the remains of the roadside cross at Helpston, a very beautiful fourteenth century cross, the base and stem in good preservation, but the head, unfortunately, missing. The church here is deserving of a longer inspection than the party could give to it, as

there are some exceedingly interesting and unusual features which were discovered at the time of the rebuilding of the tower, some thirty years ago. Five feet below the present surface the Saxon foundation was met with and many sepulchral slabs of Saxon date were found. In the chancel the original tiles remain on the kneeling step and these are figured in "Parker's Glossary." Two stone bench ends with curious carved heads remain on either side of the chancel which, at one time, supported a stone seat against the wall. Hastening away from this very interesting church, Maxey was reached about noon, and in the church the Rev. W. D. Sweeting supplemented his paper read the evening before by further observations and pointed out the particular features of the building. The north side of the nave is the earlier; the south side has the nail head ornament on the outer rim of the arcade arches. The original Norman clearstory windows and string course are clearly visible beneath the roofs of the aisles. The stairs to the rood loft remain, and on the south wall of the nave, close to the opening from the stairs to the loft, is an elegant ogee shaped piscina showing that originally the rood loft had an altar. This is regarded as a rare feature, there being only fourteen other instances recorded in England. The western arch of the north chantry is a very beautiful one, having cinquefoil cusping and ball flower terminations; the date recorded is about 1360. At the south end of the chancel is a small chamber, groined and vaulted, which was used by the Almoner of Peterborough as a strong room.

Northborough Castle and Church were the next places visited. The Castle or Manor House of Northborough was erected by Geoffrey de la Mare, about 1340, and is an extensive and picturesque building. Of the original buildings remaining, the entrance gatehouse and the hall facing it at the opposite side of a large courtyard, are the chief. The outer gate is formed of one large bold-pointed arch, but without any provision for a portcullis, and set back a few feet within it is an intermediate arch with smaller arch beside it, the oblong space thus formed being groined and vaulted originally, the springers and portions of the ribs remaining. The inner gateway was also at one time groined and vaulted. On the left of the inner entrance is a small door leading to a staircase, now partly destroyed, which communicated with the upper floor of the tower. A chamber between this staircase and the front of the building is also entered from this door and was the guardroom. Crossing the court the Great Hall is entered, lighted on both fronts by two large, two-light, square-headed and transomed windows, originally with flowing tracery in the heads. These windows are separated by a buttress on each face of the hall. At the end of the hall is a cross wall with three charming ogee-shaped arches having crockets and ball flower ornaments in the hollows of the mouldings; these doorways gave access to the offices or buteries. On the north front is a porch of the time of Henry VII., or rather later, which now gives access to the hall from the court. The whole building is now cut up by partitions and floors dividing it into chambers, and is used as a farmhouse. A short distance away is the church, and here the Rev. H. J. Dukinfield Astley, Hon. Sec., read some notes, and gave a description of its more prominent features. The church is dedicated to St. Andrew, and in several respects is a very remarkable building. It belongs respectively to the twelfth, thirteenth, and fourteenth centuries, but the original scheme was never completed. The west wall with four flat buttresses and double bell gable and north-west respond of the arcade are the earliest parts. The principal feature of the church consists of a south aisle or transept built in the middle of the fourteenth century, by Roger de Northborough, Bishop of Lichfield. It is of beautiful design and execution, with rich traceried windows, and appears to have been intended for a family burying place, as there is an extensive vault beneath. In Parker's "Domestic Architecture" this chapel is fully described, and reference made to the vacant recesses beneath the south window in relation to the effigies now lying in the churchyard at Glinon, but the notice is too lengthy to quote here. This church is associated with Cromwell and the Claypoles, and Martha, daughter of John Claypole, who died in 1663, is interred in the south transept. From Northborough the drive was continued



to Peakirk. Mr. Patrick, Hon. Sec., read a paper upon the "Church and Cell of St. Pega," and indicated the prominent objects of interest. The church at first consisted only of a Norman nave and chancel with south door. An aisle on the north was the earliest alteration, with an arcade of three semicircular arches. Mr. Patrick drew particular attention to the capitals of the north chantry arch and the chancel arch, the former showing the very beginning of the leaf ornament of the succeeding style. The south porch door is a fine example of enriched Norman work. The porch itself is of later date with groined and vaulted roof. There is a good piscina in the south wall, which has the peculiarity of possessing a small shaft in the apex of the arch, which is considered by some archaeologists to have been for the purpose of carrying off the smoke from a taper at which the officiating priest would warm his hands. A similar thing is observable at Tallington Church, and others in this neighbourhood. After inspecting the curious quatrefoil shaped opening at the north-east side of the chancel window, which was used for the exhibition of some sacred relic, and the marks of the iron bars which had protected it, the party walked to the little building called the hermitage, said to be erected on the site of the cell occupied by St. Pega, the sister of St. Guthlac, and after whom the church is dedicated and the district called Pegeland. Here Mr. Patrick continued his paper upon the history of St. Pega, and pointed out the remains of the old Saxon cross preserved within the building. The drive was continued to Gilton Church, which was described by Mr. Percy Hopkins. This church possesses a needle spire, the finest in the county. The church generally is of the Decorated period, but there are some good bits of earlier styles. In the churchyard lie the two remarkable effigies already referred to under Northborough.

The formal closing meeting of the Congress was held in the evening at Woodston Manor House, about a mile out of Peterborough, to which the members were invited by Mrs. Terrot. The house contains much good old work, and in particular a very elaborately carved overmantel to the fireplace in the drawing room. It is of sixteenth-century date, and either German or Dutch. The Rev. H. J. D. Astley, Hon. Sec., read the second part of his paper on the Manor House and Church of Northborough, which was well illustrated by MSS. and photographs.

Thursday, July 21.

This was included in the general programme as an extra day, and a large party of the members, notwithstanding the fatigue of the previous six days, joined in the excursions. Leaving Peterborough about nine, a lovely drive through several miles of woodland scenery brought the party to Apethorpe Hall, which was visited by the kindness of the Earl of Westmoreland. Thence to Fotheringhay Church, which was described by Mr. Townsend. The present nave (the chancel is gone) was built about 1435 by Edward, Duke of York. This church was specially the church of the Royal House of York, and contained the tombs of Edward, Duke of York, slain at Agincourt in 1415, and of Richard, killed at Wakefield, the father of Edward IV. Of the castle, so intimately connected with the fate of the unfortunate Queen Mary, nothing remains but the earthen mound and one large lump of stone. The drive was continued to Cotterstock, when the church was inspected, and the Rev. F. Buttanshaw gave a description and history of the building. It possesses a very long chancel, which it owes to the erection of a college for a Provost and thirteen Fellows, by John Gifford, a Canon of York. There is a fine brass to Robert Winteringham, one of the Provosts and Prebendary of Lyddington. Leaving Cotterstock, the party was conducted by Lord Melville to Warrington, one of the finest churches in the county of Northampton. This church is illustrated and described in Brandon's "Parish Churches." From Warrington the Congress proceeded to Orton-Longueville Hall, where they were received by the Marquess and Marchioness of Huntly, and inspected the curiosities contained in the house and visited the church close by, which is almost wholly of the fourteenth century. The church contains some good monuments. This ended a very successful Congress, and members reached Peterborough about 6.30.



Sketches of London Street Architecture. No. XXIV.

#### SKETCHES OF LONDON STREET ARCHITECTURE.—XXVI.

NO. 5, COLLINGHAM GARDENS.

This is one of a pair of houses which on plan, with their projecting wings, enclose three sides of a forecourt or terrace.

The rooms in the wings are on a different level from those of the main building, and are continued from the landings of the staircase, the staircase coming between the wings and the main block.

The Flemish work of the Flamboyant period has probably supplied the motive of this moulded brick building.

The buildings are part of a group of about twenty houses, all diversified, forming Collingham Gardens, designed fifteen years ago by Messrs. Ernest George & Peto.

#### THE BUILDERS' BENEVOLENT INSTITUTION.

ANNUAL MEETING.

The fifty-first annual meeting of the Builders' Benevolent Institution was held on the 21st inst. at the offices, 35, Southampton-row, Bloomsbury, W.C. Mr. Charles Wall, President, occupied the chair, supported by Messrs. Thomas Stirling, H. Holloway, E. V. New, and other friends of the Institution.

Major R. A. Brutton, secretary, read the annual report, which stated that the committee desired to express to the subscribers their thanks for the continued support to the charity. Last year being the Queen's Jubilee, and also the jubilee year of the Institution,

every eligible candidate was rejoiced by receiving the benefits of the charity. This was very satisfactory, and it was hoped that the increased liability of expense would be cheerfully met by the subscribers. Owing to the decrease of many liberal contributors, and for other reasons, new subscribers were urgently needed. The warmest thanks were due to the President, Mr. Charles Wall, for the interest he had taken in the welfare of the Institution. During the past year there had been four deaths amongst the pensioners, and three pensioners had been elected. The annual dinner will be held at Carpenters' Hall on Thursday, November 17, when Mr. Benjamin J. Greenwood, of the firm of Messrs. Holliday & Greenwood, would occupy the chair.

The Chairman proposed the adoption of the report and accounts, which was seconded by Mr. New, and unanimously agreed to.

On the motion of Mr. Thos. Stirling, a cordial vote of thanks was passed to the retiring President, Mr. Charles Wall.

Thanks were also accorded to the Vice-Presidents and to the Hon. Treasurer (Mr. George Plucknett, J.P.), with a request that he should continue his valuable services.

A similar compliment was paid to the Committee, the retiring members being reappointed, with the addition of Mr. Ritchie.

The Hon. Auditors were re-elected, and a vote of thanks accorded them for their services.

The Chairman proposed that Mr. Benjamin J. Greenwood be the President for the ensuing year; he believed Mr. Greenwood would do his utmost for the charity.



Mr. New seconded the motion, which was agreed to.

On the motion of Mr. Holloway, a vote of thanks was passed to the Chairman for presiding, and the proceedings terminated.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday at the County Hall, Spring-gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Ermondsey Vestry 4,000*l.* for paving works; Ermondsey Vestry 5,000*l.* for works at the parish depot; the Islington Guardians 50,000*l.* for the erection of an infirmary; the Shoreditch Guardians 3,140*l.* for branch school and additions to the infirmary; the Shoreditch Vestry 10,650*l.* for engineering works at baths and wash-houses; the Wandsworth District Board 1,800*l.* for underground conveniences; and the Whitechapel Guardians 7,500*l.* for alterations to workhouse.

#### The Chairman's Address.

The Chairman, in delivering his annual dress, said it was impossible to describe in detail the year's labours of the twenty-eight committees; he could only remark upon a few of the topics suggested by the records of those hours. The work of the Building Act Committee was a mass of dry but important detail. Like that of the Asylums and several other committees, it was an illustration of the purely ministrative labour which was undertaken earnestly and steadily week after week, without hope or desire of public recognition, and most without recognition by the Council itself. The improvement of the main drainage system, and the corresponding improvement in the condition of the lower portion of the Thames, would be followed by such further improvements as might be found practicable, and the Main Drainage Committee were now engaged in experiments in the filtration of sewage through a coke-filter. A purification of 65 per cent. to 80 per cent. had been obtained, and better results were still anticipated. Gold fish had lived in the filtered effluent for over three weeks. The housing of the people was a problem of gravity and magnitude, but the conditions under which the committee had to work were too stringent, and it was hoped that the Treasury would extend the period of repayment. There appeared to be an extraordinary and disproportionate cost in rehousing people displaced by public improvements, such as the proposed new street between Holborn and the Strand. To increase the mobility of the poorer class of the population would greatly assist the solution of the problem, and he looked to the extension of cheap trains and tramways to effect this object. Possession of the London Tramway Company's line south of the Thames would be obtained by the Council on January 1, 1899. They would be a valuable municipal asset, and a potent instrument for combating overcrowding and for adding to the comfort and convenience of the public. The proposal of the Improvements Committee to make a magnificent boulevard from Holborn to the Strand would add to the dignity and beauty of the capital at a minimum of cost to the ratepayers, and might even result in an ultimate financial benefit. The estimated cost of the various street improvements for which powers would be asked by Parliament was 1,100,000*l.*, and those now in progress would cost 1,750,000*l.* With regard to the Fire Brigade Committee, an additional capital expenditure of 197,000*l.* had been sanctioned. Warned by the awful calamity in Paris, the Fire Committee had introduced a Bill, giving a licence to be obtained from the Council before buildings might be used for years, such licence to be obtainable at any time. The clauses had been drafted in such a form as would not cause any interference with the retail trader. New rules had also been made for the prevention of accidents in the use of the lime-light and cinematograph in places of entertainment, referring to the Works Department, Mr. Wood said: "The department has been tried on under the new management for a more than a year. Of the work for which the new management is solely responsible, the amount which has been completed, passed by the committees, and reported to the Council is

not yet large. In fact, some of the works commenced under the old management are not yet completed and reported. So far (according to the standards of comparison adopted by the Council) the cost of the estimated and jobbing works carried out entirely under the new management shows a balance below the estimates and the schedule values respectively, and the quality of the work has been satisfactory."

**A Tramways Department.**—Mr. Benn, Chairman of the Highways Committee, moved a recommendation of the Committee to the effect that a Tramways Department should be formed for the administration of the Council's tramways, and that the General Purposes Committee should report on the organisation of such a Department, and the salary to be paid the chief officer. He said that, in the opinion of the Committee, it was necessary that a Tramways Department should be instituted at the earliest possible date. The Committee were unanimous upon the need for such an institution, and there were no parties on the Committee. By Christmas they would be called upon to administer seventy-four miles of tramways. They would be able to take over all the staff of the southern system; but, as one of the first things they would have to deal with would be electric traction, they could not put an inquiry into that upon the present officials.

After considerable discussion, the Council divided on the recommendation, which was carried by 75 to 35 votes.

**The Tramways: Stabling and Other Accommodation.**—The Highways Committee recommended, and it was agreed, "That the Council do approve the estimate of 20,000*l.* submitted by the Finance Committee for the erection by the North Metropolitan Tramways Company, at an estimated cost of 20,000*l.*, under the supervision and to the satisfaction of the Council's architect, of stabling and other buildings upon the freehold land adjoining the Lea-bridge depot, the property of the Council and leased to the company."

**Street Improvements.**—The Improvements Committee recommended that the City Corporation should be informed that the Council did not see its way to contribute to the cost of the proposed widening of Lothbury, between Old Jewry and Princes-street, as they thought it was one which should be undertaken at the cost of the City.

Mr. H. Clarke said the improvement was emphatically a Metropolitan one, and not merely one for the City. He moved that it should be referred back.

On a division the amendment was lost, 47 voting for and 67 against. The recommendation was afterwards agreed to.

The Improvements Committee also proposed: "That the estimate of 20,000*l.* submitted by the Finance Committee be approved, and that the Council do contribute, on the usual conditions, one-half of the net cost of setting back the southern side of Fleet-street between Falcon-court and the City boundary, as shown upon the plan submitted by the City Corporation, such contribution not to exceed the sum of 20,000*l.*"

Lord Tweedmouth moved that the recommendation be referred back to the Committee for further proof that the proposed improvement was deserving the sanction of the Council. He thought the Council should examine very closely into every improvement brought before it by the Improvements Committee, in order to insure that it was a Metropolitan and not merely a local improvement.

The amendment was lost, and the recommendation was then agreed to.

The same Committee also recommended, and it was agreed, that the estimate of 23,900*l.* submitted by the Finance Committee, be approved, and that the Improvements Committee be authorised to arrange for widening Nine Elms-lane to 60 ft. between Wandsworth-road and Southampton-street, and that in the event of the owners being unwilling to sell the land at a reasonable sum, the Vestry of Lambeth be asked to acquire the property compulsorily on behalf and at the cost of the Council under the powers conferred by the Act 57 Geo. III., cap. 29 (Michael Angelo Taylor's Act).

**Electric Light Installation, Crossness Outfall.**—The Main Drainage Committee recommended, and it was agreed, (a) That the estimate of 710*l.* submitted by the Finance Committee in respect of the cost of the electric light installation at the Crossness outfall, be approved, (b) That the tender of the Safety Concentric Wiring Company, Limited, amounting to 4,990*l.*, for

the supply and erection in five months of the engines, dynamos, accumulators, &c., required for the electric light installation at the Crossness outfall, be accepted; that the solicitor be instructed to prepare the contract; and that the seal of the Council be affixed to the contract when ready. (c) That the tender of Messrs. J. H. Pickup & Co., Limited, amounting to 2,712*l.* 10*s.* 7*d.*, for the supply and erection of the wiring, lamps, and fittings required for the electric light installation at the Crossness outfall be accepted.

**Compounding Engines, Crossness Outfall.**—The same committee also recommended (a) That the estimate of 8,450*l.*, submitted by the Finance Committee, be approved, and that the expenditure of a sum of 16,900*l.* in connexion with the compounding of engines at the Crossness outfall be sanctioned. (b) That the tender of Messrs. John Penn & Sons, Limited, amounting to 16,900*l.*, for converting four beam engines at the Crossness outfall into triple expansion engines be accepted.

The recommendations were agreed to.

**Barking Outfall: Sludge Settling Channels.**—It was also agreed (a) That the estimate of 8,300*l.* submitted by the Finance Committee be approved. (b) That the tender of Mr. John Cochrane, amounting to 8,150*l.*, for the supply and erection of the compound pumping engines required in connexion with the sludge-settling channels at the Barking outfall, be accepted.

**Hackney-wick Drainage.**—On the recommendation of the same Committee it was agreed (a) That the estimate of 125,000*l.* submitted by the Finance Committee be approved. (b) That a new sewer from Gainsborough-road, Hackney-wick, to the Abbey Mills pumping-station be constructed in accordance with the plans prepared by the engineer, that the work be carried out without the intervention of a contractor, and that the plans, specification, and estimate of 123,800*l.* be accordingly referred to the manager of works for the purpose.

**Bishop's Park, Fulham.**—The Parks and Open Spaces Committee recommended, and it was agreed, that the Council do approve the estimate submitted by the Finance Committee, and do agree to increase by 5,000*l.* its promised contribution of 7,500*l.* towards the extension and completion of Bishop's Park, Fulham, in accordance with the plans submitted by the Vestry, such further contribution making with the sum of 5,000*l.* already paid to the Vestry, a contribution of £17,500 towards the entire estimated cost of acquiring and laying out the park, viz., 35,245*l.*

**Office Accommodation.**—On the recommendation of the Establishment Committee, it was agreed that, subject to the necessary approval of the Treasury being obtained to the expenditure on capital account, the estimate of 25,000*l.* submitted by the Finance Committee be approved; that the Establishment Committee be authorised to negotiate for and complete the purchase of land in Warwick-street, Pall Mall, for the purpose of erecting thereon additional offices for the staff of the Council; that the work be carried out without the intervention of a contractor, and that the plans and estimate be referred to the manager for that purpose.

**Vauxhall Bridge.**—The following recommendation of the Bridges Committee was agreed to:—(a) That the standing order relating to expenditure on capital when exceeding 5,000*l.* be suspended. (b) That the estimate of 170,000*l.* submitted by the Finance Committee for the building of that portion of new Vauxhall-bridge up to springing level be approved, and that the tender of Messrs. Pethick Bros., amounting to 165,435*l.* 1*s.* 6*d.*, be accepted.

**Waterloo Bridge: Southern Approach.**—The same committee recommended, and it was agreed, that the Council do sanction an expenditure of 9,000*l.* to be expended on works in connexion with the repairing of the tops of the arches in the southern approach to Waterloo Bridge, and that the tender of the Brunswick Rock Asphalt Company, amounting to 8,978*l.* 13*s.* 7*d.*, for the work, be accepted.

**Rotherhithe Tunnel Borings.**—It was agreed to accept the tender of Messrs. Baker & Son of 1,126*l.* 8*s.* for making borings in the line of the proposed Rotherhithe Tunnel.

**District Surveyors for North Fulham and South Fulham.**—The Building Act Committee reported as follows, the recommendations being agreed to:—

The Council on May 24 last divided the pre-



viously existing district of Fulham, which comprised the whole of the parish, into two districts designated respectively North Fulham and South Fulham; the first-named district consisting of that portion of the parish of Fulham situated north of Fulham-road and the part of Fulham Palace-road from Fulham-road to Putney Bridge, and the latter district of the portion of the parish south of those roads. On July 5 Mr. F. W. Hamilton was appointed to the district of North Fulham, and Mr. S. F. Monier-Williams to that of South Fulham. The 121st section of the London Building Act, 1894, provides that "every district surveyor shall have and maintain an office at his own expense in such part of his district as may be approved by the Council;" and the two district Surveyors above referred to have asked to be allowed to have both their offices in the same building, namely Broadway House, Walham Green. In support of this request they state that the Broadway is in the busiest part of the two districts, that it is close to Walham Green railway station, and that lines of omnibuses to Putney Bridge, Hammer-smith Bridge, Wandsworth Bridge and Kensington pass along the thoroughfare. Having regard to the fact that the district has so recently been divided, the arrangement proposed may, at any rate for the present, be of advantage to the public having business with the District Surveyors; as in case of application being made to the wrong surveyor the other would be easily accessible, without the inconvenience of the applicant having to go to another office some distance away. On the whole we think that the arrangement may be approved, although it will necessarily involve a modification of the resolution of the Council of May 24 above referred to, in which the dividing line between the two districts is laid down. We recommend—(a) That the resolution of the Council of May 24, 1898, with regard to the division between the districts of North Fulham and South Fulham, be modified by the addition of the words 'one-half of the building known as Broadway House, on the north side of the Fulham-road, to be included in, and to form part of, the district of South Fulham.' (b) That the Council do, under Section 141 of the London Building Act, 1894, approve of the offices of the respective District Surveyors of North Fulham and South Fulham being situated at Broadway House, Fulham-road; and that, as required by that section, notice of the situation of such offices be given to the Local Authority."

**Works Department.**—The report of the Establishments Committee contained the following paragraph:—

"The Manager informs us that, as the erection of the Horton Asylum has been entrusted to the Works Department, it will be necessary that another assistant should be appointed for building works at a salary of 300l. per annum with the prospect of rising gradually to a maximum of 400l. We think that the proposal of the Manager should be adopted, and in view of the meeting of the Council on the 26th instant being the last before the vacation, we suggest that the selection of the most suitable candidate should be left to our Chairman and Vice-Chairman in consultation with the Clerk of the Council and the Manager of Works. We recommend—That authority be given for the appointment of an additional assistant for building works in the Works Department, at a commencing salary of 300l. a year; that an advertisement be issued inviting applications for the position, and that the Chairman and Vice-Chairman of the Establishment Committee, in consultation with the Clerk of the Council and the manager of works, be authorised to select the most suitable candidate, the selection being reported to the Council at the first meeting of the Council after the recess. The manager also informs us that if the Council on the 26th inst. adopts the recommendation of the Main Drainage Committee that the construction of the Hackney-wick sewer should be entrusted to the Works Department, it will be necessary for an additional assistant for engineering works to be appointed at a salary of 300l. We concur as to the necessity for the appointment of an engineering assistant if the proposal of the Main Drainage Committee is adopted by the Council, and recommend—That authority be given for the appointment of an additional assistant for engineering works in the Works Department at a salary of 300l. a year; that an advertisement be issued inviting applications for the position, and that the Chairman and Vice-Chairman of the Establishment Committee, in consultation with the Clerk of the Council and the Manager of Works, be authorised to select the most suitable candidate, the selection being reported to the Council at the first meeting of the Council after the recess."

Mr. Strong moved, as an amendment, and it was agreed, "That the matter be referred to the Finance Committee, with authority to authorise the Manager to employ the necessary additional assistance he may require."

**Messrs. Yarrow and the Council.**—With reference to the construction of a new and improved steam float for use by the Fire Brigade on the river, the Fire Brigade Committee published a long correspondence between it and Messrs. Yarrow, in which that firm, after

having submitted plans which had been approved of, declined to accept the conditions imposed by the Council. The conditions especially objected to were the claim of the Council through the Chief Officer to interfere with the selection and retention of the foremen employed on the job by Messrs. Yarrow, and to determine the rate of wages and hours of labour. The Fire Brigade Committee recommended that the contract be not further acted on.

Colonel Rotton moved, as an amendment, that the Standing Orders relating to contracts be suspended in this case, and that the tender of Messrs. Yarrow be accepted.

On a division the amendment was rejected by 52 votes to 29.

The following recommendations of the Housing of the Working Classes Committee were agreed to:—

**Boundary-street Scheme.**—1. That the tender of Mr. W. Griffiths, amounting to 6,738l. 14s. 5d., for paving works in Arnold-circus, Calvert-avenue, and Rochelle and Palissy streets, Boundary-street area, be accepted.

2. That the operation of Standing Order No. 311 (2) (b) be suspended so far as it relates to the erection of Hedsor and Laleham buildings, Boundary-street area. That the work of erecting Hedsor and Laleham buildings, Boundary-street area, be carried out by the Council without the intervention of a contractor; and that the plans, specification, and quantities be referred to the Manager to carry out at the amounts of his estimates of 19,277l. and 17,021l. 10s. 9d. respectively.

3. That the Standing Order No. 32 as to recommendations involving expenditure on capital accounts of sums exceeding 3,000l. be suspended so far as it relates to the erection of Benson and Abingdon buildings. That the plans, specifications, quantities, and estimates of 8,874l. and 17,913l. submitted by the Finance Committee in respect of Benson and Abingdon buildings, respectively, be approved.

**Brook-street Limehouse, Scheme.**—That the working drawings, specification, quantities, and estimate of 4,725l. 7s. 7d. submitted by the Finance Committee in respect of cottages to be erected on Plot 11, Brook-street, Limehouse, scheme, be approved; and that the Housing of the Working Classes Committee be authorised to invite tenders for the work of erecting the cottages.

**Golder's Hill, Hampstead Heath.**—The Parks and Open Spaces Committee recommended the suspension of the Standing Orders which preclude any expenditure exceeding 5,000l. being voted upon until seven days after the report has been laid before the Council, so that the proposals with reference to Golder's Hill could be dealt with.

Mr. N. Robinson moved that the Council contribute a sum not exceeding 12,000l. towards the cost of the acquisition of the Golder's Hill estate for an addition to Hampstead Heath.

Mr. Bailean opposed the recommendation, because the county in which the bulk of the land was situated had not contributed anything. The Committee were trying to rush the proposal through.

The amendment was not seconded, and the recommendation was adopted.

**New Theatre.**—The Theatres and Music Halls Committee recommended, and it was agreed, that the drawings be approved for a new theatre which it is proposed to erect at the corner of Lower-road and Cullin-road, Rotherhithe, to be known as Terris Theatre. The recommendation was agreed to.

The Council adjourned shortly before ten o'clock for the summer recess.

#### BOOKS RECEIVED.

ILLUSTRATED TOPOGRAPHICAL RECORD OF LONDON. (First series. Topographical Society of London.)

THE LAW OF LIGHT AND AIR. By A. A. Hudson and A. Inman. (F. P. Wilson, 6, St. Bride-street, E.C., and Sweet & Maxwell, Limited, 3, Gracey-lane, W.C.)

LINCOLN: THE CATHEDRAL AND SEE. By A. F. Kendrick, B.A. (George Bell & Sons.)

FLATS, &c., REGENT-STREET.—The site of Hanover Chapel is being covered by a lofty building, whereof the upper floors will be appropriated for residential flats, and the ground floor for a shop. Mr. G. D. Martin is the architect.

## Correspondence.

To the Editor of THE BUILDER.

### IRON v. STONEWARE DRAIN PIPES.

SIR,—As this is a question of importance, and one upon which there exists a difference of opinion, perhaps you will allow the "pros and cons." of the case to be discussed in your columns? It is specially necessary at this time to arrive at a decision as to which of the two materials is the better for the purpose of house drains, as it will probably be thought desirable to specify the material to be used in London when the L. C. C. by-laws as to drainage come to be framed.

That stoneware has in a measure failed, is evidenced by the use of iron pipes by most of the sanitary experts. Granted the principle that drains must be watertight, it can hardly be maintained that stoneware drains comply with modern sanitary requirements in this respect, in view of the fact that stoneware pipe drain encased in concrete cannot be relied on (in an average London site) to stand for water tight for twelve months after being laid. I imagine that although isolated cases of such drains remaining sound may be instanced, the weight of evidence will confirm the view above stated. Other objections to stoneware pipes suggest themselves: the number of joints, the difficulty of getting them joined well, the difficulty of making a sound connexion to the plumbing work above ground. The crucial disadvantage is, however, the certainty of fracture from inevitable settlements. It is found that the danger of a leak in the drain, owing to defective joints, or from settlement, is removed when heavy cast-iron pipes are used, as they may be relied upon to withstand settlement, and remain watertight after many years of service.

But now as to the disadvantages: I have in mind Dr. Corfield's opinion expressed some years ago: "It is wrong in principle to use a material known to be perishable, instead of material like stoneware which is practically unalterable." It will be interesting to hear whether Dr. Corfield adheres to this opinion, in view of the necessity for watertight drains.

Dr. J. F. J. Sykes is opposed to the use of iron drains, chiefly, I learned in the course of conversation, because of the intermittent nature of the flow which causes the drain to be alternately wet and dry, and consequently to rust and decay.

Theoretically, of course, a drain is scoured quite clean, and thorough ventilation would tend to dry the pipes as assumed; but in practice no drain quite free from a greasy coating, sufficient to keep the pipes moist.

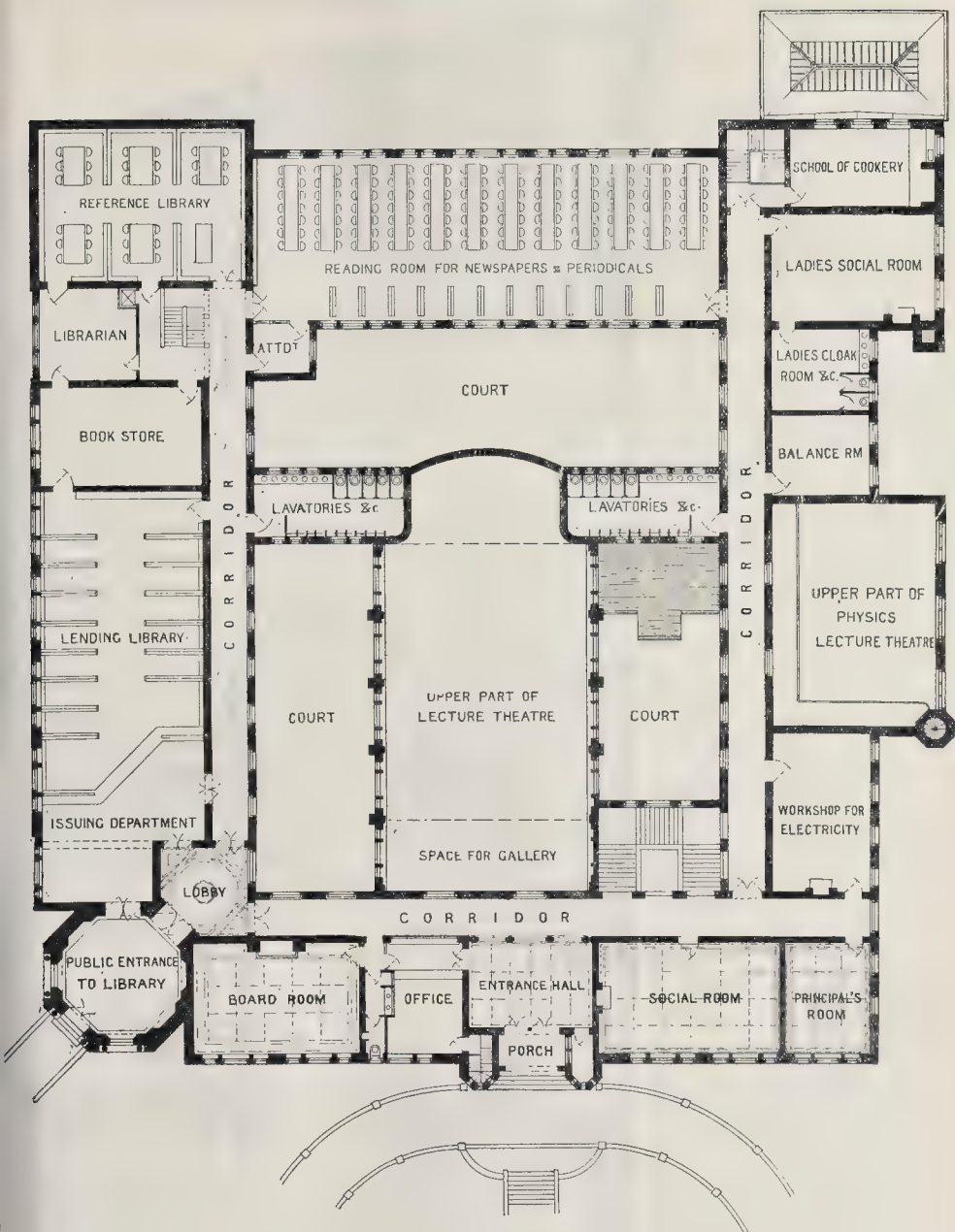
Dr. Sykes has, I believe, collected some information as to the rusting of iron pipes, which will be valuable evidence; of course, data dealing with rust in wrought-iron pipes acted on by special waters, not admissible, for the comparative oxidation of cast-iron and wrought iron is as 100 to 130, and cast-iron pipes have the additional protection of the "Angus Smith" solution. I too, sir, have seen particulars of iron pipes laid twenty to forty years ago which are still sound; but, for the present, let the opponents of iron pipes produce particulars of their decayed iron drains? GEO. VERNON.

#### COMPETITIONS.

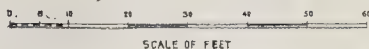
SCHOOL, GLOUCESTER.—At a meeting, on the 18th inst., of the Gloucester School Board report was read from Messrs. Martin & Chamberlain, the assessors in a limited competition for schools to be erected on the Sarps site. In the opinion of the assessors the design marked "Complete Supervision" was the best, and designs marked "Sinister Lux" and "Up-to-date" No. 1 were equal second. The Committee recommended to the Board that the design "Complete Supervision" was the best plan received. The Committee further recommended that the designs "Up-to-date" No. 1, and "Sinister Lux," were equal in merit, and that the premiums of 250l. and 100l. offered be divided equally between them. The premium is of the value of 50l. The Committee then opened the sealed envelopes and it was found that "Complete Supervision," "Sinister Lux," and "Compact" were by A. J. Dunn, A.R.I.B.A., St. Michael's-square, Gloucester; that "Up-to-date" was by H. Medland, Clarence-street; "X" by Graham Nicholas, Brunswick-road; "Absent studia in mores," by Mr. W. Jones, George-street. The schools are to accommodate 950 children.

PROPOSED BATHS, ST. PANCRAS.—The St. Pancras Vestry, having obtained the sanction of the Local Government Board to the borrowing of 17,000l. for the purchase of land in the Prince of Wales-road for the erection of baths, expects shortly to be in a position to deal with the site. With this object in view the Vestry has resolved to invite applications by advertisement from architects who have had experience





GROUND FLOOR PLAN



Competition Design for Technical Institute and Public Library, West Ham.

See page 105.

the designing of public baths and wash-houses and who are willing to submit designs for the new baths. A selection of six firms will then be made, and the architect placed first in order of merit will be asked to carry out the work. A premium of 50*l.* will be awarded to each of the five unsuccessful competitors. It is proposed to engage a professional assessor to report and advise on the designs.

WORKHOUSE, WOLVERHAMPTON.—On the 22nd inst., at the weekly meeting of the Wolverhampton Board of Guardians, a letter was read from Professor Aitchison, President of the Royal Institute of British Architects, nominating Mr. T. W. Aldwinckle, of Victoria-street, Westminster, as assessor for the purpose of assisting the Guardians in the selection of plans for the new workhouse.

WORKING MEN'S CLUB, WOLVERTON, NORTHAMPTONSHIRE.—At Wolverton, on the 16th inst., the new Working Men's Club, which has been erected at a cost of 2,300*l.*, was opened. The building is situated at the corner of Stratford-road and Cambridge-street. It has been erected by Messrs. Kemp & Sons, builders, Stantonbury, the contract drawings having been prepared by, and the work carried out under the supervision of, Messrs. Dorman & Son, architects, Northampton.

### Illustrations.

#### MEMORIAL CHAPEL, RUE JEAN-GOUJON, PARIS.

**T**HIS is the front of the chapel intended to be erected on the site of the Charity Bazaar in Rue Jean-Goujon, Paris, in memory of the victims of the fire. The formal title of the building will be "Chapelle du Bazar de la Charité." We gave some description of the intended building in a Note a few weeks ago, which we are now enabled to supplement by further details.

The object of the monument being the glorification of the martyrs to the cause of charity, the desire of the architect was to set aside all expression of grief in the design or appearance of the building, and above all to produce a monument of hope and consolation for the bereaved families, and to symbolise, by the style of architecture adopted, the beauty and charm of the errand of mercy which was being accomplished by the women of the French nobility when overtaken by the fatal catastrophe. Continuing his idea of glorification and consolation, the architect has designed the crypt and the lower portion of the chapel in a somewhat funereal style, the tone of the black marble relieved here and there with white, which decorates the lower portion of the chapel, being in keeping with the spirit of this idea of grief mingled with consolation, the consolation and glorification becoming expressed as the decoration becomes more and more rich and brilliant as it rises, until it terminates in a lofty dome full of light and painted with brilliant colours.

The whole of the building is constructed of Larrivys stone, coming from the Yonne department, the same stone with which the Galliera Museum is built, and whose fine and hard texture allows a beautiful finish. The large columns on the exterior and in the interior will be formed of Sipolin marble, a broadly-veined white marble coming from the Swiss quarries; the small columns of the interior will be formed of a costly black marble coming from the Pyrenees.

The whole of the interior will be very finely decorated with sculpture and mosaic work, but the various artists for this work have not yet been decided upon. Behind the altar-piece, the drawing of which shows a very clever and artistic design, will stand a figure of the Virgin Mary in bronze, and over 16 ft. high. The stations of the Chemin de Croix will be tastefully decorated, but the greater portion of the decoration will be of stucco, for it is feared that the estimated amount of 800,000 francs set aside for the monument will not allow for stone or marble decoration. The various portions of the interior decoration of black marble will be relieved here and there with rich ornaments of bronze.

The architect is M. A. Guilbert, Architecte du Gouvernement, and Inspecteur des Monuments Historiques. The monument will take about two years to complete.

#### A MAUSOLEUM.

The design shows the building as originally suggested by the architect. Coloured marbles being specially desired, he adopted a Byzantine treatment as being most suitable, a rectangular plan, with pendentives, and a dome over, to be lined with mosaic decoration, rich with Christian symbolism.

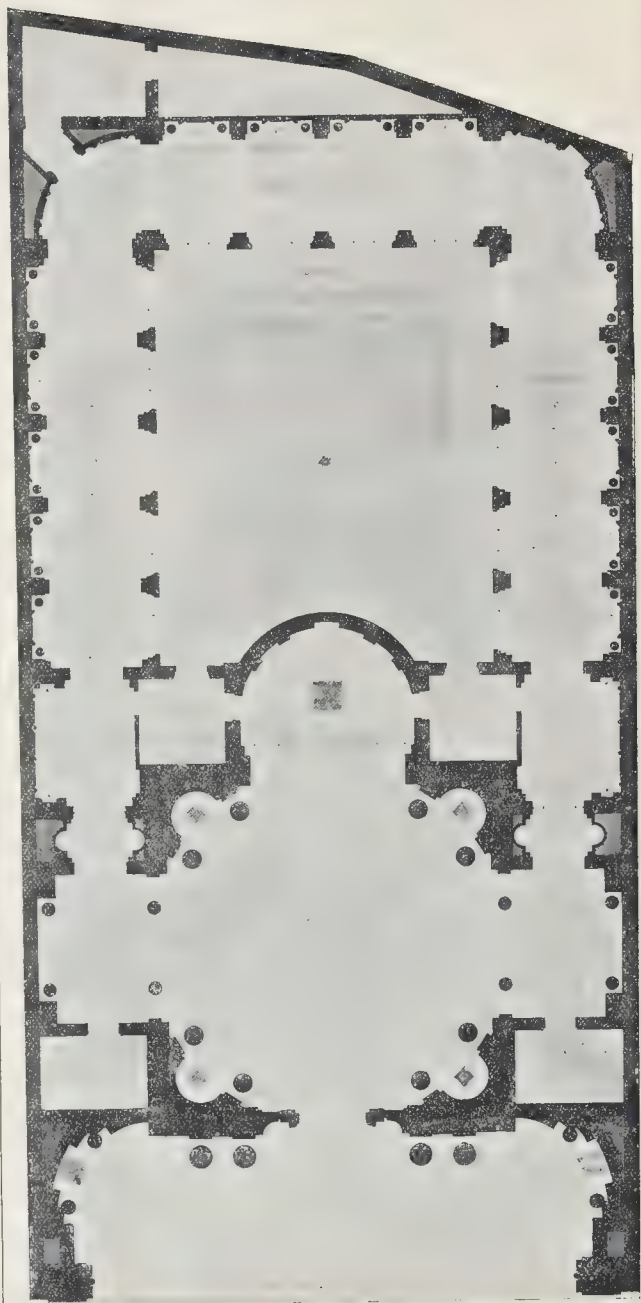
Four shallow recesses on plan contain respectively the bronze doors and two seats with kneelers for mourners; the small altar with screen opposite, and the two sarcophagi on either side, with canopies over.

The design as eventually carried out in the Necropolis, Woking, in Portland stone, shows a simple treatment, Middle Gothic in character. The work was executed by Messrs. Bingham & Sons, of Fulham-road, and includes a stained glass window by Mr. James Fisher.

J. LEONARD WILLIAMS.

#### PLYMOUTH CITADEL—NEW BARRACKS AND RECREATION BLOCK.

In designing this block of buildings, in course of erection from plans prepared under directions from the War Office, and which are situated on the east curtain wall of what a few years ago formed the inner ramparts of the old historic fortress, now (unfortunately for the antiquary) the only rampart, an effort has been

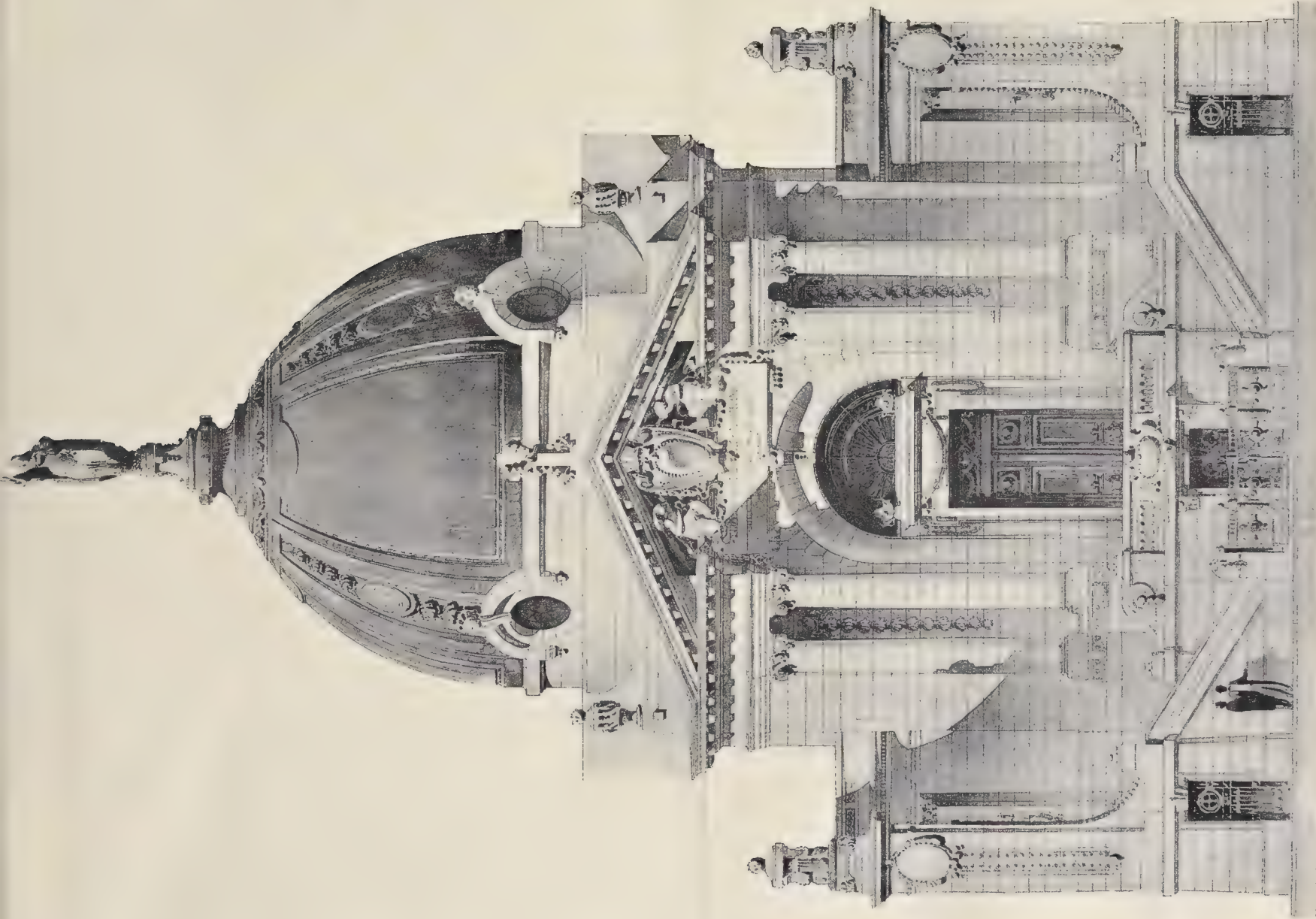


Memorial Chapel, Rue Jean-Goujon, Paris. Plan.

made to endue the building with a more inviting aspect than the ordinary type of barracks, which too often appear rather like prisons than a home for the soldier in times of peace, and also to engraft into its expression some of the spirit of historical antiquity with which it is surrounded, and to make it in some degree subservient to the massy grey ramparts into which it is embedded. The site is an uncommon one, as will be seen from the illustration, and seemed at first to present some difficulty in

the satisfactory arrangement of a building of the kind, access only being obtainable on one side and with a legion of rules and regulations to contend with; the difficulties, however, is often the case, presented the opportunity. The demolition necessarily affects the least interesting portion of the fortress, and the elevation of the new work has been designed to disturb as little as possible the repose of the old ramparts. The old massive granite plinths and string course are rebuilt in the new work.



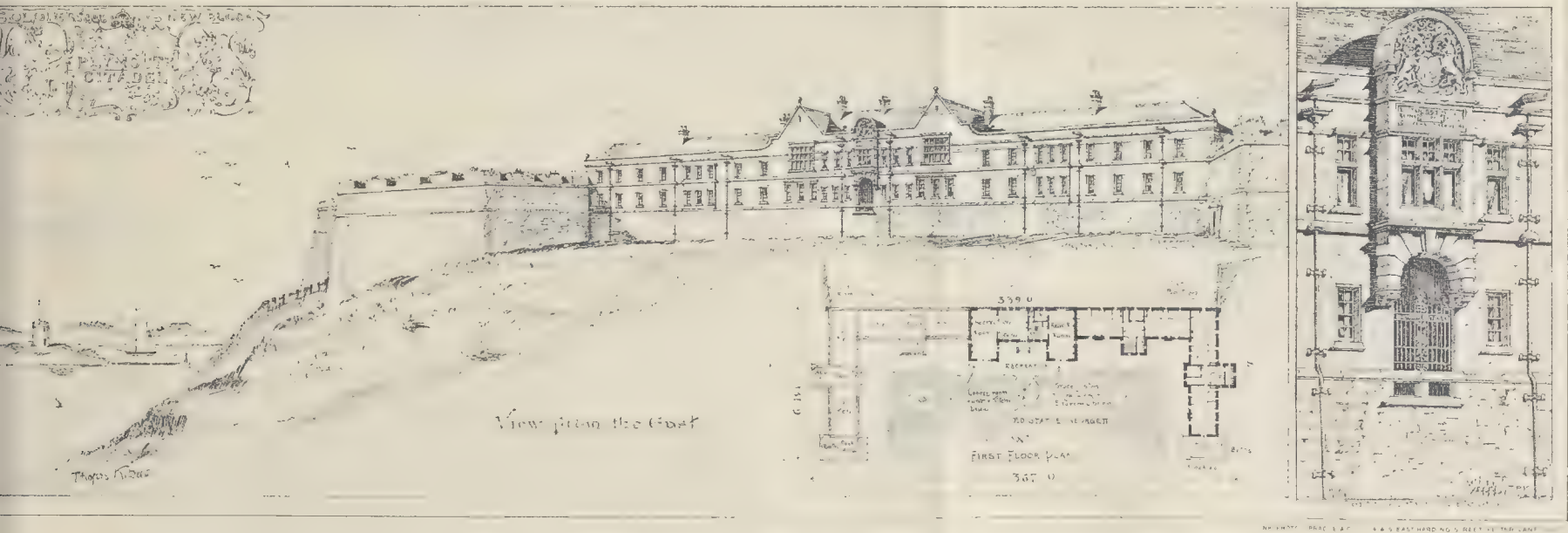


NEW YORK: STICKLEY, B. & CO., 44 N. EAST-40TH ST., NEW YORK, N. Y.

THE CHAPEL TO BE ERECTED IN RUE JEAN GOUJON, PARIS, IN MEMORY OF THE VICTIMS OF THE BAZAAR FIRE.—M. GUILBERT, ARCHITECT





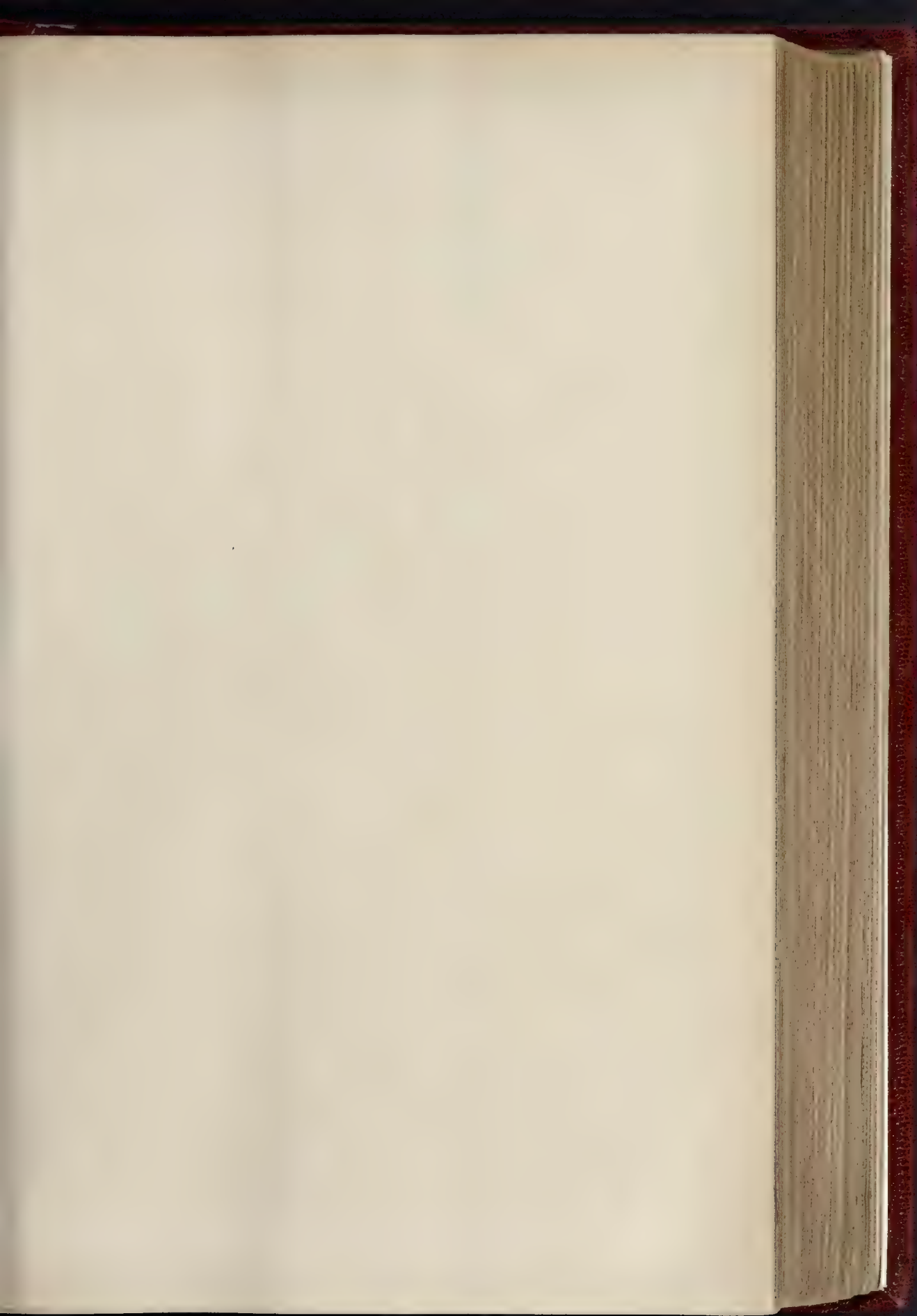


PLYMOUTH CITADEL. NEW RECREATION AND SOLDIERS' BLOCK.—MR. T. ROGERS KITSELL, A.R.I.B.A., ARCHITECT.

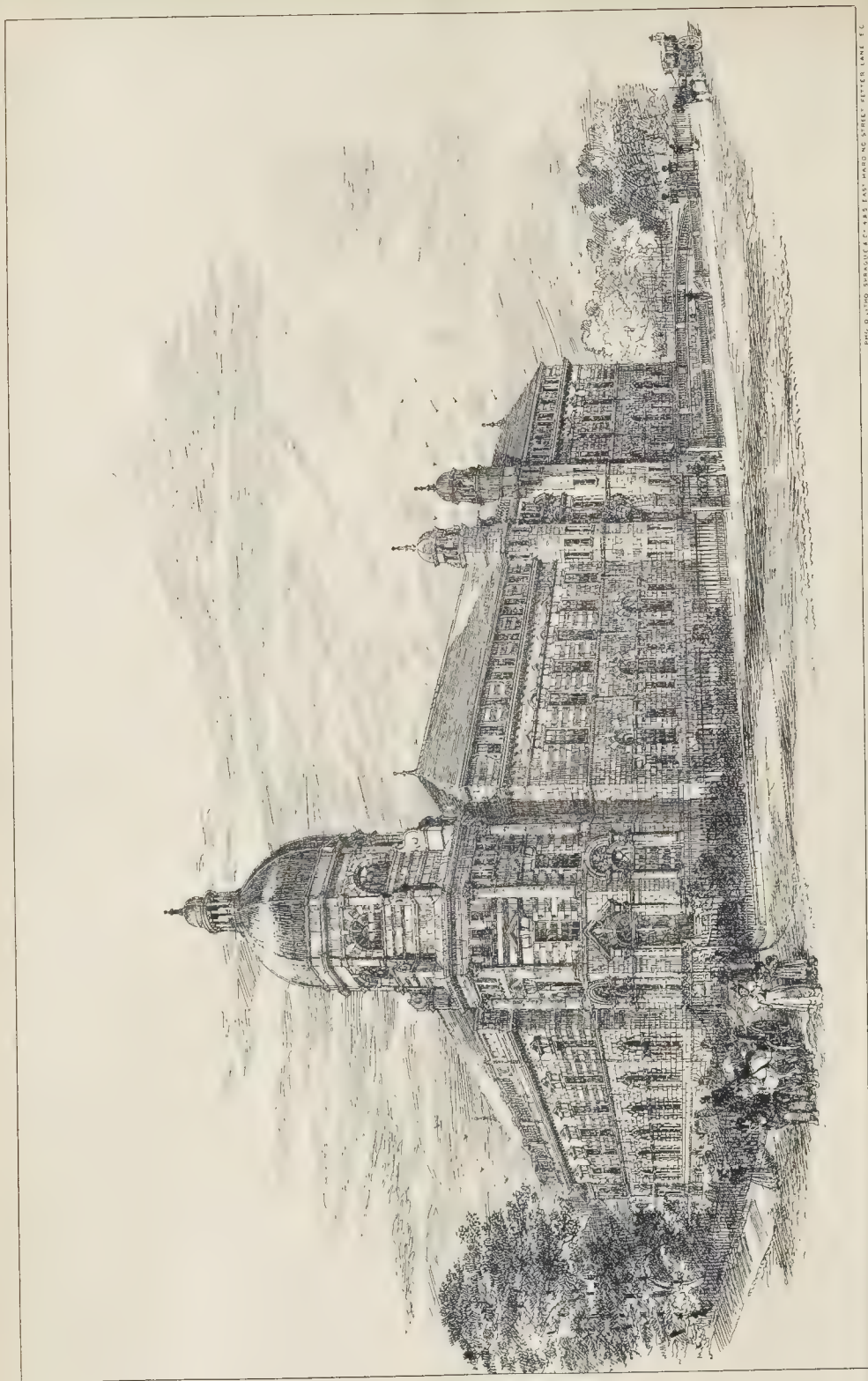


DESIGN FOR MAUSOLEUM EXTERIOR BY MR J L WILLIAMS





THE BUILDER, JULY 30, 1898.







BUSINESS PREMISES, ALLOWAY STREET, AYR.—MR. J. K. HUNTER, ARCHITECT

PHOTO LITHO BY SPENCER & CO. 43 & 45, 141, HARLING STREET, LONDON, E.C. 4



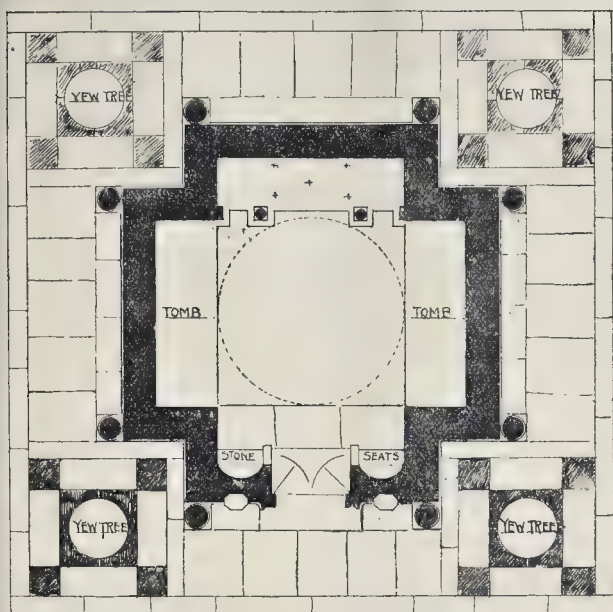




DESIGN FOR MAUSOLEUM INTERIOR—By Mr J L WILLIAMS







Design for Mausoleum. Plan.

at their original level, and so preserve that continuity of long low lines with which the eye is familiar, and which is characteristic of the Citadel, and the preservation of which in the new work seems to wed it so satisfactorily to the old. The general arrangement and treatment is a simple one. The recreation block, with its reading and recreation rooms, coffee room and bar, grocery shop and manager's quarters, is placed in the centre with the four soldiers' barrack wings flanking it on either side, and at a point dictated by the conditions of the site returns to form three sides of a quadrangle. The cook houses and baths, conveniently situated for all the barrack rooms. In the centre of the quadrangle is the fine old statue of George II. re-erected here from the site of the new officers' mess block. The walls are built of the local limestone with Portland stone dressings, a 3-in. cavity and a lining of 7-in. brickwork; these substantial walls will add to the desired effect by providing depth of reveal for windows, doorways, and other features, and will harmonise with the character of the Citadel. The carving of the Royal Arms in the pediment is in the hands of Mr. Frith, London. Captain Godby, R.E., is the officer under whose immediate supervision the work is being carried out. Mr. H. Saunders is the clerk of works, and the contractor is Mr. H. Kerswell, Plymouth. T. R. KITSSELL.

#### DESIGN FOR TECHNICAL INSTITUTE AND PUBLIC LIBRARY, WEST HAM.

This design was submitted in competition for the West Ham Technical Institute and Public Library, and was intended to be constructed of stone, with red brick to the principal fronts facing Romford-road and Water-lane. It was proposed to cover the roofs with green slates, and the roofs of the tower and ureens with copper.

The plan may be described as quadrangular in shape formed round three spacious courts, and connected on each floor by three corridors. The ground floor raised above the level of the road is approached to the principal entrance by a semi-circular terraced drive of easy gradient, whilst the public library is approached separately through the tower at the south-west angle of the site.

The large lecture-hall, available for purposes

of the Institute and public entertainment, is situated in the basement, and is approached by a separate entrance formed under the terrace leading to the principal entrance.

The physics laboratories, preparation rooms, lecture theatre, laundry, boiler and engine rooms, engineering and other workshops, caretaker's quarters, &c., are also provided for in the basement.

On the first floor are the chemical laboratories and class-rooms, &c.

The whole of the second floor, connected by a wide corridor facing Romford-road, is devoted to the art schools, with north light to all class-rooms. The estimated cost was 40,956l.

The design is by Mr. Frederick W. Marks.

#### NEW BUILDINGS, ALLOWAY-STREET AYR, N.B.

THESE business premises have been erected on a good corner site, near the railway station, and in what is rapidly becoming the better business part of the town. The stone used throughout the building is the Ballochmyle red freestone. The roofs are flat, and covered with asphalt by Messrs. W. G. Walker & Sons, of Ayr. The ground floor comprises five large shops with saloons, cellars, and lavatories on a very complete scale. The upper stories are let partly as offices and partly as dwelling-houses. The ground floor, first floor, and cellars are lit by electric light. The lower block has yet to be built. The contractors are as follows:—Mason work, A. McLachlan & Son, Ayr; joiner work, D. J. Milligan, Ayr; plumber work, Dinman & Murphy, Ayr; plaster work, W. Miller, Ayr; asphalt work, W. G. Walker & Sons, Ayr; ironwork, G. L. Connell, Glasgow; electric lighting, W. Auld & Sons, Ayr; painter work, J. B. Bennett & Sons, Ayr.

J. KENNEDY HUNTER.

THE PATENT OFFICE.—During the rebuilding of the Patent Office (old block) the business of the library will be carried on in temporary premises situated at the west end of Chichester-rents, Chancery-lane, whither the specifications, books, and other works of reference have now been removed. The office for deposit of applications for letters patent, inquiries, &c., has been transferred to the new buildings in the Garden-court, Staple Inn.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

**Clapham.**—Wood, iron, and canvas pent erected on the forecourt of No. 28, Northcote-road, abutting on Cairns-road, Battersea (Mr. J. Adams).—Consent.

**Rotherhithe.**—An open iron gangway across Shad Thames, to connect Messrs. Dudin & Son's warehouses on the north and south sides of that street (Messrs. W. A. Crips & Sons).—Consent.

**Southwark West.**—An iron gangway to connect, at the second floor level, warehouse premises on the east and west sides of Montague-cloze, London Bridge (Mr. E. A. B. Crockett for Messrs. Humphrey & Co.).—Consent.

**Marylebone, East.**—A balcony, at the first floor level, in front of Nos. 72 and 73, Wimpole-street (Messrs. Goodwyn & Sons for Mr. C. J. G. Coles).—Consent.

**Rotherhithe.**—A theatre on the site of Nos. 32, 34, and 36, Lower-road, to abut also upon Culling-road. (Mr. W. G. R. Sprague for Messrs. Marler & Saunders).—Consent.

**St. George, Hanover-square.**—An open portico at the entrance to No. 11, Hill-street, Berkeley-square (Colonel R. W. Edis for the Duke of Newcastle).—Consent.

**City of London.**—New head offices, with oriel windows, on the Victoria-embankment to abut at the rear upon Tallis-street, and flank upon Temple-avenue, and to exceed in height the width of those streets respectively (Mr. A. N. Bromley for the National Telephone Company, Limited).—Refused.

**Stecney.**—Two covered play-sheds at the Ben Jonson Schools, Emmott-street, Mile-end Old-town (Mr. T. J. Bailey for the School Board for London).—Refused.

**Lambeth North.**—Iron and glass covered-way in front of the Waterloo Hotel, York-road (Mr. G. K. Denkin for Messrs. J. & H. Denkin).—Refused.

**Westminster.**—Bay windows to Block III. of residential flats on the north-east side of Carlisle-place, at the corner of Francis-street (Mr. G. Baines for Mr. G. Martin).—Refused.

##### Building on Open Space at Rear.

**Finsbury, Central.**—That the Council in the exercise of its powers under Section 41 of the London Building Act, 1894, do not permit the building recently sanctioned on a portion of the open space at the rear of the "London Spa" public-house and Northampton Estate Audit Rooms, No. 70, Exmouth-street, Clerkenwell, at the corner of Rosoman-street, to be increased in height (Messrs. W. A. Aickman and J. K. Bateman for Mr. H. H. Finch).—Agreed.

##### Width of Way.

**Mile End.**—The rebuilding of Nos. 16, 18, 20, 22, 24, and 26, Frimley-street, Mile End (Mr. E. Jackson).—Consent.

##### Width of Way and Space at Rear.

**Hampstead.**—That the Council, in the exercise of its powers under Sections 13, 22, 41, and 73 of the London Building Act, 1894, do not consent to, nor permit of, and do also determine not to sanction the erection of, a block of five-story residential flats with wooden bay windows, on the site of Nos. 2, 3, and 4, Church-row and grounds, to abut at the rear on a lane leading from Heath-street (Mr. G. Sherrin for Mr. G. Paget).—Agreed.

##### Height of Buildings.

**City of London.**—New offices on the Victoria Embankment, Whitefriars, at the corner of Carmelite-street, with the flank of the building to exceed in height the width of that street (Mr. E. T. Hall, for the Metropolitan Asylums Board).—Consent.

**Westminster.**—Retention of the portion of a large block of flats, known as Westminster Palace-gardens, abutting upon Artillery-row, which has been erected to a height exceeding 90 ft. (Mr. A. Blackford for Messrs. J. Smith & Son).—Refused.

##### Deviation from Certified Plans.

**Marylebone, East.**—Deviations from the plans, certified by the District Surveyor under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of Nos. 116, 118, 120, 122, 124, 126, 128, 130, and 132, Oxford-street, and Nos. 1, 2, 3, 4, and 5, Wells-street (Mr. J. Slater for Messrs. Salaman & Co., Limited).—Consent.

**Strand.**—Certain deviations from the plans certified by the District Surveyor under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of Nos. 7 and 8, Rupert-street, Coventry-street, St. James's (Messrs. Shoebridge & Rising for Messrs. Poole & Lucas).—Consent.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



## Formation of Streets.

**Leutsham.**—That an order be issued to Mr. J. W. Webb, sanctioning the widening of a street, and way at present used for carriage traffic, and the widening and adaptation for carriage traffic of part of a footway, in continuation of Blythe Hill-lane, Forest Hill.—Agreed.

**Hackney, North.**—That an order be issued to Mr. C. Cheston, sanctioning the formation or laying out of a new street for carriage traffic in continuation of a street leading out of the south side of Evering-road, and the diversion of part of Heatherley-street, Clapton. That the name Heatherley-street be approved for the new street.—Agreed.

**Hampstead.**—That an order be issued to Mr. C. J. Beutley, refusing to sanction the formation or laying out, for carriage traffic, of new streets to lead out of Belsize-avenue, Haverstock Hill.—Agreed.

## Means of Escape at Top of High Buildings.

**St. George, Hanover-square.**—That Mr. G. D. Martin be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is prepared to grant a certificate in respect of the means of escape, in case of fire, to be provided for the persons dwelling or employed on the fifth and sixth floors of the Premier Hotel, Nos. 47 and 48, Dover-street, Piccadilly, for Mr. W. G. Hornsey.—Consent.

**City of London.**—That Mr. C. Thompson be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is not prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the top floor of No. 147, Queen Victoria-street (for Messrs. Babcock & Wilcox).—Agreed.

**Marylebone, West.**—That Messrs. Metcalf & Greig be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is not prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the sixth floor of Abbey Court, No. 47, Abbey-road, St. John's Wood (for the Mansions Estate Company).—Agreed.

## Extension above Diagonal Line.

**Marylebone, West.**—That the Council do determine not to sanction the extension, above the diagonal line mentioned in Section 41 of the London Building Act, 1894, of a portion of a building, viz., the "Globe" public-house, which is proposed to be rebuilt on the site of Nos. 43, 45, and 47, Marylebone-road and No. 21, York-place, with an open space at the rear of the new building (Mr. W. H. Scrymgeour for Mr. J. C. Stock).—Agreed.

## Artisans' Dwellings.

**Whitechapel.**—Three blocks of dwelling houses to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site between Brady-street dwellings, Salomon's almshouses, and the Jews' district burial-ground, Brady-street, Whitechapel (Mr. H. H. Collins for Messrs. N. & R. Davis).—Consent.

**Hampstead.**—A dwelling-house to be inhabited by persons of the working class, to be erected, not abutting upon a street, on the west side of a yard leading out of Church-lane, adjoining the grounds of the Sailors' Daughters' Home (Mr. J. Emblin-Walker for Mr. W. H. Watts, jun.).—Refused.

## Open Space about Buildings.

**St. George, Hanover-square.**—Buildings on part of the open space at the rear of Ashburnham-mansions, No. 30, Dover-street, Piccadilly, at the corner of Hay Hill (Mr. J. Macvicar Anderson).—Consent.

**St. George, Hanover-square.**—Two three-story stables with living rooms over, on the south side of North-row, Park-lane, with an open space at the rear, and to extend above the diagonal line as directed by Section 41 of the London Building Act, 1894, to be drawn (Mr. S. R. J. Smith for Messrs. Bywaters).—Consent.

## Cubical Extent.

**Finchbury, Central.**—A variation from the plans sanctioned by it on March 9, 1897, for the erection on the west side of Berry-street at the corner of Little Sutton-street, Clerkenwell, of an addition to a fermenting-house (Mr. W. Bradford for the Cannon Brewery Company, Limited).—Consent.

**Battersea.**—The erection at Ransome's Dock, Park-road, Battersea, of a building to exceed in extent 250,000, but not 337,000 cubic ft., and to be used only for the purposes of the trade of smokeless fuel manufacturers (Mr. E. Drummond for the directors of Hartridge's Smokeless Fuel, Limited).—Refused.

## Conversion and Separation of Buildings.

**Hampstead.**—That the Council, in the exercise of its powers under Section 207 of the London Building Act, 1894, do not consent to the conversion into residential flats of No. 13, Belsize-grove, Haverstock Hill, without complying with the provisions of Sections 68 and 74 (3) of the Act, so far as they relate to the construction of the floors, staircases, &c., of the building proposed to be altered (Mr. C. E. Wilkinson).—Agreed.

## Dwelling-houses on Low-lying Lands.—Part XI.

**Poplar.**—That the Solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. G. Larnan for the erection of five dwelling-houses on low-lying land situated in Galbraith-street, Poplar.—Agreed.

The recommendation marked † is contrary to the views of the Local Authority.

## The Student's Column.

## SOUND, LIGHT, AND HEAT.—V.

## THE TRANSMISSION OF SOUND (continued).

WITH a view to further test the capabilities of water to transmit or propagate sound, Sir Charles Wheatstone and Dr. J. H. Gladstone made a series of exhaustive experiments, suggested, no doubt, by the nature of the evidence given before the Lighthouse Commission. We have seen that, under certain circumstances, sound has been transmitted under water for the great distance of nearly twenty-two miles. The independent observations of the two last-mentioned experimentalists show that they agreed also that sound would travel very far in water; but it was found that the liquid modified the character of the sound considerably. Moreover, a musical note would not travel far, and all that was heard was a thud or tick. A difficulty thus arose from a practical standpoint in that, over fairly long distances, it was impossible to distinguish between one sound and another. Long bars of steel struck by a hammer gave a volume of sound which was heard at a considerable distance, and Dr. Gladstone noticed that when the weather was rough the sound of waves upon the shore and the rolling of the shingle could be heard at a long distance. He thought that, for mariners' purposes, it might be useful in some cases to listen under water in the neighbourhood of a rocky or pebbly shore during fog. At the conclusion of their work, however, the two observers mentioned stated their conviction that fog-signals from lighthouses should rather be made through the air than through water.

**Whistles.**—The application of the steam whistle for signalling at sea during fogs need not be touched upon here. For lighthouse purposes whistles have long been used, though the siren now plays a most important part in that respect. Mr. Alex. Gordon, C.E.,\* was the first to suggest their use in combination with a reflector, for the purpose of collecting and condensing the sound into a phonic beam. He proposed to sound the whistle either by air or steam; and to place it either in a Bordier Marcet double reflector, for sounding all round the horizon, or in a focus common to three parabolic reflectors grouped together, revolving on a vertical axis.

In 1850 a whistle sounded by compressed air was brought out and used in the United States. The "Report of the United States Lighthouse Board for 1852" (pp. 466-473) describes this as having a condenser of 225 gallons capacity, filled by two air-pumps 3 in. in diameter, and 8 in. stroke, worked from a cranked axle driven by simple gearing, and moved by one horse. The condenser could be filled to a pressure of from 40 lbs. to 50 lbs. in seven and a half minutes by slow gearing, and in four minutes by fast gearing; and the whistle sounded once every three minutes. During dense fogs this whistle was distinctly heard at from six to eight miles, against a light breeze six miles, and at five miles with the wind blowing transversely to the direction of the sound. In a rough sea it was heard at a distance of two and a half miles. It is further stated that with such a whistle the direction of the sound (a most important point) could be ascertained with greater accuracy than with a bell or gun.

From that year onwards considerable improvements in whistle signals for lighthouses continued to be made. Mr. Alex. Beuzley, C.E.,† deals at some length on the subject in his well-known paper, "On Phonic Coast Fog-Signals." The principle in most of them remained the same, the chief improvements consisting in the method of blowing the instrument and in the class of power employed.

**Trumpets.**—During the past fifty years these have been extensively employed at lighthouses,

under various names. An apparatus brought out by Admiral Taylor in 1844 consisted of a condenser, filled by air-pumps worked from a cranked axle driven by a winch. A set of piston-keys allowed the air to pass into the sounding pipes, four in number, having metallic springs or reeds to produce the sound. By combining and varying the notes signals were conveyed. This instrument could be heard six to eight miles away in foggy weather.

A compressed air trumpet was brought out in 1851 which could be distinctly heard six miles away, against a light breeze, during dense fog; in 1860 the trumpet was made to revolve so as to increase the area over which it could be heard in any given time. The method of using compressed air was found to possess many advantages and is to this day largely employed in lighthouse establishments in connexion with sirens. The condensing engine and apparatus may be stationed at a considerable distance from the trumpet, the compressed air being communicated by a pipe which became a continuation of the condenser. Professor Holmes who devised several novel forms of lighthouse trumpets, suggested that in order to utilise the whole of the sound of one of his improved instruments, a kind of sounding board should be employed, placed above the mouth to send out rising sounds (which escaped) in a horizontal line.

The application of the siren may be explained by referring to the lighthouse established at Ailsa Craig at the entrance to the Firth of Clyde. The island is 2½ miles in circumference, and rises to a height of 1,113 ft. above the sea. There was considerable difficulty in accomplishing the efficient marking of this danger during fogs, as, on account of the great height of the island, a fog-horn on the summit would have been of little service, whilst one placed at the base of the precipitous cliffs would also have been of little avail, as the sound would have been unheard over a great part of the horizon—the cliffs would have cut it off. Further, there was only one available spot on the island on its west side, where the necessary buildings could have been erected. The problem was to get the sound round both to the north and the south sides of the island. This was accomplished by erecting buildings on the available site referred to, which were made to act as a sort of central station whilst two fog-horns were erected above high-water mark in the north and south of the island respectively, and it was arranged to convey the compressed air to the horns in piping laid round the base of the island. This scheme was at first regarded in the light of a wild idea; indeed, before the Board of Trade would give its sanction for the necessary expenditure they suggested that certain experiments should be carried out. It was, however, found to be perfectly feasible in practice. Eventually the air pipes were laid to the north and south trumpets and sirens, and the latter in each case were mounted on an air-receiver, and placed in a trumpet house. In describing the sound apparatus Mr. D. A. Stevenson, the engineer, states\* that the south signal was produced by a double-note siren giving three blasts in quick succession—the first and third high notes of 640 vibrations per second, and the second a low note of 280 vibrations per second. The north signal was produced by a single-note siren giving a high note of 640 vibrations per second every three minutes. The student is referred to Mr. Stevenson's memoir for details and drawings of the sirens and the buildings erected, which are typical of their class.

## VELOCITY OF SOUND.

From what has been said in previous articles it will be gathered that as the progress of sound waves is not even practically instantaneous, but gradual, some time is occupied in their travelling from one place to another. The rate of travelling depends on the medium through which they travel.

In air the velocity has been commonly determined by stationing two cannons at known distances apart, in such positions as that they can be readily seen, and being fired simultaneously at each station the time which elapses between seeing the flash and hearing the sound is accurately recorded by means of chronometers. It is not necessary to apply any correction on account of the velocity of light, for even when the distances traversed by the sound

\* Select Committee on Lighthouses—Evidence, 1845, Nos. 4433-4457.  
† Cf. Min. Proc. Inst. C.E., Vol. xxviii., 1871, pp. 108 et seq., where much information of historical interest will be found.

\* "Min. Proc. Inst. C.E.," Vol. lxxviii., 1887, p. 300.



are ten to fifteen miles, light traverses that in an inappreciable moment of time; consequently, the time as recorded by the chronometers may be taken as exact for all practical purposes. But temperature, barometric readings, and velocity and direction of the wind must, of course, be taken into account as in dealing with the transmission of sound. Atkinson observes\* that introducing corrections for the barometric pressure, temperature, and hygrometric state, and eliminating the influence of the wind (too variable to be taken into account in arriving at a standard), Moll and Van Beek's results as recalculated by Schröder van der Kolk gave 1,092.78 ft. as the velocity of sound in one second in dry air at 0 deg. Cent., and under a pressure of 760 mm. Kendall found in the Arctic regions that the velocity of sound at a temperature of -40 deg. was 314 metres per second, whilst very careful determinations made by Stone at the Cape of Good Hope yielded 1,090.57 ft., or 332.4 metres per second as the velocity of sound at 0 deg. there. In round figures it may therefore be assumed that the velocity of sound at zero is about 333 metres per second. The velocity increases with increase of temperature to the extent of about 2 ft. for every degree Centigrade. All sounds, no matter what their intensity, travel at the same rate for practical purposes, though they do not all travel so far. This is aptly illustrated by Atkinson, who remarks that the tune played by a band is heard at a great distance without alteration, except in intensity, which could not be the case if some sounds travelled more rapidly than others. That is not strictly true, however, for, as the same author observes, a mathematical investigation of the laws of the propagation of sound, leads us to conclude that the velocity of a sound really depends on its strength; so that a violent sound ought to be propagated with greater velocity than a gentler one. That this is a fact is instanced by the circumstance that during Parry's expedition in the Arctic regions, a command to fire a gun was heard some distance off, after the report of the gun itself was heard. And other similar cases could be adduced.

#### OBITUARY.

On the 17th inst. Herr Ludwig Wilhelm, founder and head of the well-known Art Ironworks of Vienna, died at Rodaun, in the sixty-fifth year of his age. He gained a foremost place in his business, and one of his works—the so-called "Iron Man" on the top of the Guldthall, was presented to the town of Vienna as an adornment of Schmidt's first building. He was born at Minden, Westphalia, on July 16, 1833. In 1864 he settled in Vienna and founded the business which his skill and industry so quickly advanced. In the Vienna Exhibition he obtained a medal, and in 1878 was granted the Golden Cross by the Emperor. In all great exhibitions since, his works have obtained the first prize. He son inherits, and will continue, the business.

#### APPOINTMENTS.

SALFORD.—At the weekly meeting of the Salford Union Board, on the 22nd inst. a considerable portion of the time of the meeting was occupied in considering the appointment of an architect for the new workhouse proposed to be built near the Union Infirmary at Hope. The following seven selected candidates waited upon the Board:—Messrs. E. Christy, J. B. Broadbent, Thomas Worthington & Son, W. Telford Gunson & Son, Henry Lord, Darbyshire, Smith, and Snell, all of this city, and E. Kirby, Liverpool. The candidates were each in turn questioned as to whether they were prepared to accept the specified terms laid down by the Guardians, and the general reply was in the affirmative, with the exception of the amount of commission offered, namely, five per cent., including quantities. There was no objection to this. The candidates retired, and they were interviewed in a body on the point by the chairman and clerk, and finally Messrs. Telford Gunson & Son received the appointment.—*Manchester City News.*

APPOINTMENT OF SANITARY INSPECTORS.—The Local Government Board has sanctioned the re-appointment of Messrs. A. Bennett and W. Freeman as sanitary inspectors in Holborn.

ABERDEEN.—A meeting of the Aberdeen Town Council Gas and Electric Lighting Committee was held on the 21st inst., to make the appointment of an electrical engineer to the Corporation. The four candidates on the short list were—Messrs. J. A. Bell, Blackpool; John R. Dick, London; Charles M. Johnston, Lancaster; and H. Turner, London. A vote was taken, and Mr. Bell was appointed.

#### GENERAL BUILDING NEWS.

ADDITIONS TO CHURCH, SWINDON.—The memorial stone of the new north aisle of St. Barnabas Church, situated at Gorse Hill, Swindon, was laid on the 16th inst. The aisle will seat 150 people, making the total accommodation of the edifice about 500. The new work will cost about 850l. Mr. J. P. Seddon, of London, was the architect, and Mr. Jones, of Gloucester, the builder.

CHURCH, NORTHAMPTON.—The construction of the foundations of the new church for Northampton, which has been named Christ Church, and which will be situated upon the Wellingborough-road, opposite Mansfield-road, has been commenced. The building which is now in course of erection will be a temporary church of wood and iron. The present building is being erected by Mr. Henry Martin, under the direction and supervision of Mr. M. H. Hogg. It will consist of a nave and chancel, with vestries and two western porches.

RESTORATION OF KIRTON CHURCH, NOTTINGHAMSHIRE.—It is proposed to restore this church, at a cost of about 4,000l. Mr. Fowler, of Durham, is the architect, and Messrs. Bowman & Sons, of Stamford, are the contractors.

ST. MARY MAGDALENE, BERMONDSEY.—Mr. E. Crosse has been appointed as superintending architect for some alterations and decorations of the church, upon the tender of Messrs. Bartlett & Co. The church, restored in 1830 by George Porter, who remodelled the west front, repaired the tower, and reinstated the large pointed window, was re-seated and improved twenty years ago. It was built in 1680 upon the site of one that had been erected by the priors of Bermondsey Abbey for the use of their tenants, and, after the suppression, had been converted into the parish church. It owns an interesting set of communion plate, comprising a silver salver, which bears the figure of a knight kneeling to receive his helmet from a woman at a fortress-gate, reputedly of Edward II.'s time, and a relic from the Abbey; whilst the registers are known to antiquarians for their many singular entries and the exactitude with which they have been kept. Aylwin Child built the convent in 1082, some Cistercian monks settled there in 1080, and William II. endowed them with Bermondsey manor. The churchyard, about 1½ acres, was laid out as a public recreation ground twelve or thirteen years ago, at a cost of 1,300l., borne by an ordinary vestry rate.

WESLEYAN SCHOOL-CHAPEL, HORFIELD, GLOUCESTER.—The foundation-stones have just been laid of a Wesleyan school-chapel, Horfield. The new buildings will consist of a hall, 60 ft. by 43 ft., capable of accommodating 500 persons. This will be seated with chairs, and is to be used as a temporary chapel until a permanent building is erected on the ground adjoining. At the same time, it is so designed as to be easily adapted for a central hall, with class-rooms on each side, thus to form a Sunday school. There are entrances with granite columns, and at the further end is an arched recess containing the rostrum and communion platform. In the rear of the hall are four class-rooms opening out of a passage, which communicates also with the hall, and has an external entrance on each side of the building. Three of the class-rooms measure 15 ft. by 11 ft. each, while the fourth, a rather larger room, is intended for an infant school. One room is fitted up as a minister's vestry, and in the basement there is to be a kitchen, with provision for tea-meetings. On the first floor will be a room 24 ft. by 20 ft., capable of seating 100 persons; this will be used as a Church parlour. The roof will be covered with green slates, and surmounted by a flèche, rising 20 ft. from Gloucester-road. The plans of Messrs. La Trobe & Weston were selected in a limited competition, and the building is being carried out under their superintendence, Mr. E. Love being the contractor, and Mr. B. R. Lewis clerk of works.

WESLEYAN CHURCH AND SCHOOLS, SHEFFIELD.—The memorial stones have just been laid of the new Wesleyan Methodist Church and Sunday schools to be erected on Firth Park-road. The architect is Mr. John Wills, of Derby. The buildings will consist eventually of four blocks—a church block, with vestries; a schoolroom block, with central hall and class-rooms around; a class-room block, in two stories; and a social block, with club-rooms, reading-rooms, &c. The present scheme includes the two former blocks only. The church is planned to face the junction of the two roads, and will have a tower and spire 115 ft. high. The plan of the church is cruciform, with nave, aisles, transepts, and chancel, the nave having clearstory lights. The front main entrance has a projecting porch with outer doors; while intermediate doors lead into a lobby, which has also intermediate doors leading to the ground floor, and also communicating right and left with lobbies that lead to the end gallery. The front gable has a four-light tracery window. The pulpit will be of pitch pine, and under the chancel windows will be a pitch pine reredos. There are five exit doors. There is a minister's vestry and a choir vestry, also a cellar for heating apparatus. The church is 88 ft. long inside by 11 ft. wide and 63 ft. 8 in. wide across the transepts, the chancel is 20 ft. deep, thus making the entire length inside, including nave and chancel, 108 ft. The church will seat (including the end gallery) 734 adults, or a mixed congregation of 960 persons. The school block consists of a central hall,

55 ft. by 30 ft., with class-rooms arranged around it as follows:—One for young women, 24 ft. by 16 ft.; one similar for young men, one for infants, 21 ft. by 16 ft.; and three other class-rooms, making a total of six rooms, in addition to the central hall; one of the larger class-rooms is arranged to open into the hall. In these rooms accommodation is afforded for a Sunday school of 500 children, and provision is made for enlargement by the addition of three more class-rooms. The builder is Mr. George Carr, of Sheffield, and the cost will exceed 9,000l.

NEW BETHEL, LOWESTOFT.—The foundation-stone has just been laid of a new Sailors' Bethel, Battery Green-road, Lowestoft. The new building will consist of a chapel 36 ft. by 72 ft. 6 in., with a schoolroom to the north side, with waiting-room, and to the front a small meeting-room. The accommodation will be for between 800 and 900 people. Mr. R. C. Cole is the contractor for the building. The building will be of one story. Red bricks are to be used. Mr. F. W. Richards is the architect.

SCHOOL, GREAT YARMOUTH.—New boys' schools have been erected in St. Peter's-road, for the Great Yarmouth School Board. The schools are built on a site next to the Nelson School. The site extends from the St. Peter's-road to the Devonshire-road. This new building will accommodate 450 boys, and is two floors in height. The school has two main entrances, one for the ground floor and one for the first floor. The ground floor entrance leads into a corridor, the walls of which are of glazed bricks of two colours. The hat lobby is planned so that the boys can enter and leave the same without passing each other. The walls of the hat lobby are also lined with glazed bricks. From the corridor the school-rooms are entered, the larger room being 66 ft. by 21 ft. 6 in., and the smaller room 44 ft. by 21 ft. 6 in., both rooms being 14 ft. 6 in. high. The entrance to the upper floor leads to a fireproof staircase, the walls being lined with glazed bricks. Going up two flights, a mezzanine floor is reached, consisting of the headmaster's room, the teachers' room, and the school store. The headmaster's room commands the corridor and staircase. The top floor is similar in plan and construction to the ground plan, but the rooms are 16 ft. high. There is a lavatory on each floor. The walls of the schools and class-rooms have Columbian pine dadoes. The floors of all rooms are also stepped up for desks, and the large rooms are divided by means of sliding partitions. Every room has also its own museum, or bookcase. The floors throughout the schools are of pitch pine wood blocks. All the rooms and corridors are lighted by electricity. The elevations are of red bricks, and the dressings are of Monk's Park stone; the roofs are covered with slates, and the design is in keeping with the Nelson Schools adjoining, which are from the designs of the same architects. The offices are built with white glazed bricks, and the latrines and all sanitary appliances are from Messrs. Adams & Co., of Leeds. The closets, &c., are all flushed with salt water. There is also a drinking fountain in the playground. During the holidays the playground will be tar paved. The general contractor for the work is Mr. J. Ward, and his sub-contractors are Mr. F. Grimble, carpenter and joiner; Messrs. Stanley Bros., stone-masons; and Messrs. Dawber, slaters. The contractor for the plumber, glazier, and painter's work is Mr. R. A. Eastoe, and for the electrical work Mr. A. Pank. The architects are Messrs. Bottle & Olley, the architects to the School Board.

SCHOOLS, BURTON LATIMER, NORTHAMPTONSHIRE.—The memorial stones were laid recently of a new school at Burton Latimer. The site is in High-street. The plans of the schools have been prepared by Messrs. Gutch & Saunders, Kettering. The building will be of red brick with stone facings.

PROPOSED NEW HIGHER GRADE SCHOOL, & C., ISLE OF MAN.—Mr. T. W. Cubbon, architect, Birkenhead, has recently received instructions from the Clothworkers' Company to proceed with an educational scheme in the Isle of Man, comprising the erection of a new Higher Grade School, also new science and technical school. It has also been decided to enlarge two of the existing schools.

SCHOOL, NEATH.—The foundation stone has just been laid of the new school buildings which are to be erected from the designs of Mr. J. C. Rees. The contract has been let to Mr. David Jenkins at 10,700l. The new schools will comprise the three departments, and provide accommodation for 950 children. CONSERVATIVE CLUB, GORTON, MANCHESTER.—On the 16th inst. Mr. Ernest F. G. Hatch, M.P., opened a new Conservative Working Men's Club at Gorton. The new building is situated at the junction of Gorton-lane, Church-lane, and Wellington-street. The new club has been erected from the designs of Mr. Thomas J. Bushell. It consists of a billiard-room, 50 ft. by 25 ft., an assembly-room of the same dimensions, reading committee, card, and smoking-rooms, with cloak-rooms, the usual conveniences, and apartments for the caretaker. The total cost has been about 1,500l.

VILLAGE HALL AT CEMAES, ANGLESEY.—Mr. David Hughes, J.P., of Liverpool, has presented a new public hall to the village of Cemaes, Anglesey. The edifice is situated in the centre of the village. It contains on the ground floor a hall, to be used for concerts and public meetings; with seating accommodation for 250 people. At one end is the platform, raised 3 ft. above the hall floor. At the rear of the platform are retiring-rooms for ladies

\* Ganot's Physics, 1893, p. 210.



and gentlemen. The main entrance to the building is through an open portico into a large vestibule. On the left of the main entrance after leaving the vestibule is the news and smoke-room. The reading-room and library is entered from the hall. At the rear of the building are the ladies' and gentlemen's lavatories, also the keeper's house. Above the main entrance is the clock tower, rising some 50 ft. high, the upper portion being octagonal. The building has been erected by Mr. David Hughes's own workmen, the architects being Messrs. Richard Owens & Son, Liverpool.

**BELFRY TOWER, PEMBRIDGE, HEREFORD.**—It is proposed to restore the old detached belfry tower at Pembridge. The architect is Mr. Cossins, of Birmingham.

**ISOLATION HOSPITAL, BARNSELY.**—The foundation-stone has just been laid in Lund-lane, Monk Bretton, Barnsley, of a new isolation hospital. The new institution, which is from the plans of Mr. J. H. Taylor, C.E., Borough Surveyor, will consist of five blocks of buildings, viz., entrance and discharge block, isolation block, administrative block, main road block, laundry and disinfecting block. The isolation block will comprise male and female wards, with nurses' duty-rooms. The administrative block will be three stories in height, with water tower in the centre, and will contain dispenser's-room, waiting-room, matron's and nurses' dining, sitting, and bedrooms, &c. The main ward block includes male and female ward, each 36 ft. by 26 ft., and two wards for the treatment of special cases, &c. The walls are to be of brick, relieved by mouldings and stone dressings. The tenders, amounting to 5,990l., accepted, are as follows:—Mason and brickwork, Messrs. J. & C. D. Potter; joiner, J. Smith, Gawber; plasterer, Fleming; slater, Messrs. Dauber & Son, Limited; plumber, glazier, smith, and founder, B. Denison; hot-water engineer and painter, Messrs. Snowden & Son; disinfectant and laundry engineer, Manchester Laundry Engineering Company.

**BRANCH SCHOOL OF ART, BIRMINGHAM.**—At a meeting of the Birmingham Museum and School of Art Committee, held on the 18th inst., at the Council House, Mr. W. H. Bidlake submitted plans for the branch Municipal School of Art in the Moseley-road, the erection of which was authorised recently by the City Council. The plans were approved, and it was decided to send out invitations to eight selected firms to tender for the building.

**REBUILDING IN OXFORD-STREET.**—Rebuilding in this thoroughfare proceeds apace. On the north side the extensive premises of a formerly well-known firm of linen drapers (now dissolved) are marked for demolition; nearly opposite, next, east, to Dean-street, the Tudor Hotel and Restaurant is nearly completed. The architect is Mr. P. E. Pilchard.

**ST. JOHN'S MISSION HALL, ISLINGTON.**—The foundation stone of the new mission hall for St. John's, Cleveland-road, Islington, has just been laid. The new hall is to accommodate 300 persons, and in the basement there will be a gymnasium for boys and girls, a couple of class-rooms, and a cooking kitchen. Mr. Burmester, of Lincoln's Inn-fields, is the architect, and Messrs. Grover, of New North road, the builders. The building contract is 2,900l.

**MUSEUM, ST. ALBANS.**—The foundation-stone of the Hertfordshire County Museum was laid on the 20th inst. in Hatfield-road, St. Albans. The architect is Mr. A. S. Flower, of London.

**THEATRE, EUSTON-ROAD.**—The site of Nos. 37 to 43 (odd)—on the south side, in St. Pancras parish—has been taken for the erection of a theatre, to be planned and designed by, we gather, Messrs. Wylson & Long.

**BUILDING IN FETTER-LANE.**—The ground which has been for some while vacant at the west end of West Harding-street and in Fetter-lane is now taken for building purposes. At the north corner premises are being built by Mr. Fortescue for Messrs. Edward Burnard & Sons, after the plans and designs of Mr. H. H. Collins; the architect of the block of shops and offices at the south corner is Mr. R. M. Roe.

**PALACE RESTAURANT, GLASGOW.**—This building is to occupy a site in West Regent-street and Renfield-street. The building is to be eight stories in height, and will form two blocks with entrances from Renfield-street and West Regent-street. The upper floors will be fitted to suit tenants, and will be let as offices. They are to be furnished with passenger hoists, and electric light will be fitted throughout. The building is to be of red sandstone and Peterhead granite, and the architects are Messrs. F. Burnett & Boston, of Glasgow.

**CORRYAGE HOSPITAL, AUCKLAND, DURHAM.**—The foundation-stone of this building has just been laid. Mr. G. H. Bell is the builder, and Mr. James Garry, of West Hartlepool, is the architect.

**PARISH COUNCIL OFFICES, BRECHIN.**—The offices for the Parish Council of Brechin have been erected from plans prepared by Mr. D. Wishart Galloway, architect and surveyor, Brechin.

**BOARD SCHOOLS, CHURCH, GRESLEY, DERBYSHIRE.**—New Board schools were opened at Church Gresley recently. The buildings are designed on the class-room system, and are arranged in two blocks—one mixed school to accommodate 400 scholars, and an infant school to accommodate 300 children. The mixed school has a central hall 62 ft. by 31 ft., and the six class-rooms, each 25 ft. by 24 ft., are

grouped round it. There are separate cloak-room and lavatory accommodation, with entrances for boys and girls at opposite ends of the hall. Teachers' rooms and store-rooms are also provided. The hall and class-rooms are divided by glazed screens. The infants' block has a central hall, 45 ft. by 28 ft., with four class-rooms grouped round it. There are separate entrances at each end of the main hall, with cloak-rooms, lavatories, book stores, and teachers' rooms. All the rooms are heated by hot water, but in the babies' room an open fireplace is provided as well. The outer walls are of red pressed bricks, with buff terra-cotta dressings, and the roofs are covered with Broseley tiles. The bell turret is on the hall of the mixed schools. The whole of the work has been carried out by Mr. Charles Venning, of Swadincote, the sub-contractors being Mr. Earp (Newhall), brickwork, and Mr. G. W. Mason (Swadincote), plumbing, glazing, and painting, the amount of Mr. Venning's contract being 6,075l. The whole has been designed by and carried out under the supervision of Mr. Robert C. Clarke, architect, Nottingham.

**WORKSHOPS, CLUVE-KING, IPSWICH.**—A new club-room for Messrs. Kunsoms & Co. Rapid Limited, has just been opened at the Waterside Works. The building is in bungalow form, of red and white brick, 100 ft. long, and 30 ft. wide, with a verandah on the frontage. A dining-room extends nearly the whole length of the shelter. The architect was Mr. Leonard Stokes, of Westminster, and the builder Mr. Fred Bennett, of Ipswich.

**WORKSHOPS, BRENTWOOD.**—In re-organising the training schools at Brentwood, the Hackney Guardians found the old workshops quite inadequate, and they are now erecting a new building 72 ft. long by 27 ft. wide, and three stories high. It will be entirely devoted to technical instruction, separate workshops being provided for tailoring, shoemaking, carpentry, painting, plumbing, and engineering. Offices are also to be provided for the use of each instructor. The building is being constructed with Fletton bricks. The builder is Mr. S. R. Lambie, of Kenilworth Town, and the architect Mr. W. A. Finch, of Ipswich.

**THEATRE, KENNINGTON.**—The memorial stone of the Princess of Wales Theatre, Kennington Park-road, was laid on Monday afternoon by Sir Henry Irving. The building will occupy a site having frontages of about 80 ft. to Kennington Park-road, 150 ft. to South-place, and 90 ft. to De Laune-street. The whole of the main frontage will be executed in Portland stone, the elevation being of Italian Renaissance character. The more expensive parts of the house will be entered from Kennington-road by steps running the entire length of the 51 ft. wide stone colonnade, into a vestibule lobby, and thence to the grand crush-room. This apartment will be one of the features of the building, having a length of 42 ft. and a width of 22 ft. The walls will be of Italian marble, with recessed marble columns. From this crush-room will rise a marble staircase 27 ft. wide, branching out on each side to the dress circle, with a separate entrance to each side of the stalls. Directly above the main crush-room will be a ladies' foyer and the grand saloon, both of these apartments being quite separate. The style of decoration throughout the interior will be French Renaissance, with a free introduction of paintings on the ceilings and the panellings. The auditorium will have an average depth of 70 ft., and a width of 51 ft., and will be constructed on the two-tiers system—viz., stalls, pit stalls, and pit on the ground floor, the dress circle forming the first tier or balcony, and the gallery and amphitheatre being the second tier. Large saloons are adjacent to each part of the theatre, the pit saloon having the walls entirely covered by fancy tiling. Heating and ventilation will be conducted on the plenum system. A complete set of hydrants and fire appliances is arranged, and the stage will be fitted with a special double asbestos and steel fireproof curtain, controllable by one man. The stage is about 80 ft. wide and 40 ft. deep. The dressing-rooms are separated from the stage by brick walls and iron doors. Large scenery stores, painting-rooms, and property-rooms &c., are included in the scheme. Mr. W. G. R. Sprague is the architect.

#### SANITARY AND ENGINEERING NEWS.

**SEWERAGE SCHEME, MANSHIELD, NOTTINGHAMSHIRE.**—The Mansfield Town Council having applied to the Local Government Board for sanction to borrow 15,000l. for purposes of sewerage and sewage disposal, Major-General H. D. Crocker, R.E., one of the Board's inspectors, conducted a public inquiry into the matter at the Town Hall on the 20th inst. In consequence of the illness of the Borough Surveyor (Mr. R. F. Vallance), Mr. L. A. Westwick (Messrs. Vallance & Westwick) attended and explained the details of the plans and specifications.

**ASHBY-DE-SOUL SEWERAGE.**—At a recent meeting of the Bingham Rural District Council, Mr. H. Smith, J.P., presiding, it was decided that Messrs. Sands & Walker, civil engineers, Nottingham, be instructed to prepare a scheme of sewerage and sewage disposal for the district.

**PIER AND PAVILION, MORECAMBE.**—A new pavilion has just been opened on Morecambe pier. It has been erected from the designs of

Messrs. Mangnall & Littlewood, architects, of Manchester, by Messrs. Peters & Sons, of Rochdale. Prior, however, to the contractors beginning work on the pavilion there was much to be done to the pier itself, and this was left in the hands of the Widnes Iron Company. The pier has been widened from 20 ft. to 42 ft. from the entrance, and though the old pier-head has not been interfered with, a platform of 250 ft. long by 150 ft. wide, has been constructed to form the superstructure for the pavilion. There are three doorways at the entrance to the pavilion, approached by a series of steps. The doorways lead into a crush hall, which has the usual pay offices and a staircase to the right and the left leading into the balcony, and there are another pair of swing doors opening into an inner entrance hall, with four outside balconies, which are to be made into roof gardens. There will be six shops around the pavilion, with a shelter on either side, whilst the manager's office and the directors' room will be on the west side. There are seven dressing-rooms on the east side of the stage, and it is contemplated to increase this number to eleven by carrying out work higher. On the other side there are hand-rooms, property-rooms, and other offices. The stage front is 30 ft. wide. At the back of the pavilion there is to be an ornamental verandah and shelter. In addition to the contractors mentioned there were the following sub-contractors:—Mr. Boekbinder, London, decorations; Mr. Higginbotham, Idle, plumbing work and tinted glass; Messrs. A. S. Dean, Birmingham, zinc roofing; Messrs. A. R. Taylor, Limited, Birmingham, seating, &c.; Messrs. Baxendale & Co., Manchester, lead lighting. The work for the most part has been carried out under the personal supervision of Mr. Littlewood, junior, and Mr. Hollingworth has been the representative of Messrs. Peters the contractors.

**INSTOCK SEWERAGE WORKS, LEICESTER.**—The new sewers and outfall works at Instock have just been opened. Mr. H. J. Clarkson, C.E., of Tamworth, was the engineer, and the contractor was Mr. J. Ford.

**STREET AND SEWERAGE QUESTIONS, BLACKPOOL.**—Colonel C. H. Luard, R.E., held an inquiry at Blackpool on the 21st, into the Corporation's application to borrow 5,000l. for the construction of a sewer outlet at the Gynn, 4,781l. for works of private street improvement, and 2,714l. for works of public street improvement. Mr. Wolstenholme (Borough Surveyor) detailed the proposed works.

**WATER SUPPLY, CROYDON.**—On the 25th inst., Mr. G. W. Willcocks, M.Inst.C.E., and Dr. S. W. Wheatons held an inquiry at Croydon on behalf of the Local Government Board into the application of the Corporation for a loan of 25,000l. for the sinking of a well at Waddon for the purpose of an additional water supply for the borough. Mr. Balfour Browne, Q.C. (for the Corporation), having made an opening statement in which he pointed out the law on the question of providing water supplies, Mr. T. Walker, the Borough Engineer, stated that last year 1,130 new houses were built in Croydon, and this year 926 had been approved for erection. It was reckoned that this rate would go on for the next ten years. Owing to the small rainfall of the last ten months their springs were low, and the water supply was now only just equal to the demand. They wanted another 500,000 gallons a day. During the past twenty days they had had to make the supply intermittent, to almost cease watering the roads, and to leave off flushing the sewers to a large extent.

#### STAINED GLASS AND DECORATION.

**WINDOWS, DORKING.**—New stained-glass windows are being placed in the sanctuary of the Dorking Roman Catholic Church. The work is being executed by Messrs. Lavers, Westlake, & Barrard, of London.

**MEMORIAL WINDOW, MALVERN.**—On the 19th inst. a stained-glass window, given to the Priory Church, in commemoration of the Queen's Diamond Jubilee, was unveiled. The window is in the north transept. It has three lights, illustrating the parable of the ten Virgins. The window was supplied by Winfields, Limited, Birmingham. Mr. T. W. Camm of Smethwick, being the architect.

**PUBLIC IMPROVEMENTS, BIDEFORD.**—At the Bridge Hall, Bideford, on the 22nd inst., Colonel A. G. Durnford, R.E., held an inquiry concerning the proposal of the Bideford Town Council to borrow 1,500l. to complete the Park scheme and make a roadway across the heath across the old Pitt. Mr. George B. Latham, engineer, explained how the money was expended.



## FOREIGN.

FRANCE.—A monument to Lemaître, the celebrated artist, is to be placed in the Square Valmy, with a portrait bust executed by M. Granet.—At the Gobelin manufactory a tapestry has just been completed which was ordered two years ago as a present to the Empress of Russia. It is a copy of Mme. Lebrun's picture of Marie Antoinette and her children.—The Minister of Public Instruction has formally opened the new gallery of casts at the Louvre, arranged under the care of M. Radon, the architect.—A marble bust of Michelet, the work of M. Antonin Mercet, has been placed in the Panthéon.—A considerable number of Deputies of the French Parliament have put their names to a proposal to recommend the construction of a canal from Paris to Rouen, as a work of "utilité publique."—The new mairie at Vincennes, near Paris, has just been opened. M. Lecapue is the architect.—M. Vieille has been elected President of the Society of Architects of Doubs.—A monument to the poet Alain Chartier has just been inaugurated at Bayeux, the work of two sculptors, MM. Tony-Noël and Leduc. The pedestal is designed by M. Montier, architect.—The Municipal Council of Marseilles has adopted a scheme for the erection of a Colonial Museum, at an estimated cost of 450,000 francs, with a winter garden attached to it. The museum will be built on the site of the old St. Charles cemetery, and will be connected with the new Science College.—We have to record the death, at Eretat, of M. Henri Dumesnil, the intimate friend of Courcier and Troyon, and author of some well-known critical studies on their works.

AUSTRIA.—The Imperial Jubilee is to be commemorated in Neumarkt by a new water supply, to cost, approximately, 30,000 florins, and by the erection of a new inn.—In Grosswasser, near Olmütz, the commemoration is to take the form of a schoolhouse, to be commenced this year and finished in 1899.—Extensive repairing works are in progress in the first Bezirk (district) of Vienna, which will require an expenditure of some 150,000 florins. The streets and lanes are being paved with granite.—An agreement has been made between the Corporation of Vienna and the Sophienbad Company, whereby the company is to pay the Corporation a rent of 5,000 florins for the use of part of the street for the erection of a portico of six pillars with entablature. The piece of ground in question remains the property of the Corporation.—Business premises for the Czerowitz Electrical Works and Street-car Company are to be erected by Herr Osar Petri, Imperial Architect.—Herr Löwe of Hanover, a specialist in gymnastic construction, has completed plans for the new gymnnasium for Olmütz. The ground floor is to be a skating rink, the upper story to contain the gymnastic apparatus.—A theatre is to be built in Znaim, under the superintendence of Herr Roth; the cost is to be 110,000 to 120,000 florins.—A company has started in Brunn for the erection of cottage model lodgings.—It has been decided to erect a station for the fire-brigade at Laibach at a cost of 177,800 florins. The old station has to be demolished, it having been seriously injured by an earthquake. Messrs. Hinträger, of Vienna, have won the competition.

## MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—We are informed that Messrs. Francis Morton & Co., Limited, of Hamilton Ironworks, Garston, are now in a position to execute orders. The undertaking has been acquired by a syndicate of Liverpool and Manchester gentlemen, and the services of Mr. Malcolm Blair have been secured, who was for eighteen years in the engineering department of the "Carson & Knowles Coal and Iron Company."

"THE HEREFORD EARTHQUAKE OF DECEMBER 7, 1895."—A work with this title will be published in the autumn of the present year. The Hereford earthquake was one of the most important ever recorded in this country. Though inferior to the Essex earthquake of 1884 with regard to the damage done to buildings, its disturbed area was at least twice as great, being not less than 100,000 square miles. It was felt in every English county, except the three northern ones, over the whole of Wales and the Isle of Man, and in the eastern counties of Ireland. The author is Mr. Charles Davison, and the publishers are Messrs. Cornish Bros., Birmingham.

HOLFORD HALL, CHESHIRE.—The sale in thirty-eight lots of the Holford estate, comprising the Manor and 1,300 acres of freehold land, was fixed for the 28th inst., at Manchester. Holford Hall, distant three miles from Northwich, overlooks a valley watered by the Peover Eye. It was built by Mary, widow of Sir Hugh Cholmondeley, whom James I. called "the bold lady of Cheshire," after the contest he carried on during forty years with her father's brother, George Cholmondeley, of Newbrough in Dorset, in respect of her heritage. The house, constructed for the most part of timber, brickwork, and plaster, stands within a moat. Of the original building only two of the three sides have remained (the fourth side of the quadrangle lay open to the moat and bridge); the upper stories projecting towards the inner courtyard on wooden pillars over a piazza; one of

the exterior fronts was built with gables of unequal height and projection, the other with two rows of bay windows, separated by large brick chimneys. The estate lies in Plumley and Lostock-Gralam parishes.

"SCOTTISH WOODWORK OF THE SIXTEENTH AND SEVENTEENTH CENTURIES."—Mr. Eneas Mackay, publisher, Stirling, announces a re-issue of this work. It was originally issued in 1877, but only 250 copies were printed. The work as re-issued will be the same size as the original, the principal plates will be fac-similes of the former edition, but the full-sized plates will be reduced one-half. Mr. John W. Small, F.S.A. (Scot.), architect, Stirling, is the author.

ELECTRIC LIGHTING, BURY ST. EDMUNDS.—An inquiry has just been held at the Guildhall, Bury St. Edmunds, by Mr. H. P. Boulnois, M. Inst. C.E., Inspector to the Local Government Board, with reference to the proposed expenditure by the Town Council of Bury of 20,000*l.* for purposes of electric lighting. Among those present were Mr. J. C. Smith (Borough Surveyor) and Mr. Medhurst (Electrical Engineer).

PROPOSED CITY IMPROVEMENTS.—On the 21st inst. a meeting of the Court of Common Council was held at the Guildhall. The Finance and Improvement Committees submitted for approval a plan for continuing the improvement of Fleet-street by making it 60 ft. wide westward of St. Dunstan's Church to the City boundary. The report was carried. In regard to contemplated improvements in St. Paul's churchyard and Cheapside, the Committee reported that they had settled a claim for the freehold interest in No. 44, Cheapside, for 6,850*l.*, and had made an arrangement for acquiring the leasehold and trade interest of Messrs. D. Nicholson & Co. in the ground required to widen the public way in front of Nos. 50 and 51, St. Paul's churchyard, for 4,500*l.* A report was brought up from the City Lands Committee, enclosing a letter from the Home Secretary, conveying the terms upon which the Government would be ready to co-operate in the scheme for the rebuilding of the Sessions House, Old Bailey. The letter was read, and it stated that the Government would be ready to hand over the male wing of Newgate Prison in consideration of the sum of 40,000*l.* No demand would be made on the Corporation to provide prison accommodation in lieu of that wing, or to provide extra cells at Holloway, but some sleeping cells and a kitchen should be added to the new Sessions House. The Committee asked the Court to sanction the proposal set forth in the letter, and to refer the matter back to them to carry into execution. The report was agreed to.

THE SANITARY INSTITUTE CONGRESS, BIRMINGHAM.—A meeting was held on the 21st inst. of the local General Committee having the arrangements in hand for the forthcoming visit of the Sanitary Institute to Birmingham. The Lord Mayor (Councillor Beale) presided, and stated that over one thousand delegates had been appointed to attend by the different organisations, and, if they added that number to those who are locally interested, they might be sure there would be large audiences.—The officers, in their report, stated that the date fixed for the Congress is from Tuesday, September 27, to Saturday, October 1 (inclusive). The inaugural address of the President will be delivered on Tuesday afternoon, September 27, and the conferences will be held in Mason University College on Wednesday, the 28th. The mornings of Thursday, the 29th, and Friday, the 30th, will be devoted to the sectional meetings. Tickets of membership of the Congress will be ready for issue at an early date, and may be obtained at the local offices, which are in the Council House. Holders of Congress tickets will be entitled to attend all the conferences and meetings of sections, to join the excursions, to admission to the exhibition, and will receive invitations to the reception given by the Lord Mayor, and to the garden party at the Edgbaston Botanical Gardens. The Lord Mayor and the President of the Congress (Sir J. Foyrer, Bart.) will, in accordance with practice, attend a public luncheon, which will be held on September 27, at the Grand Hotel. The subjects to be discussed include the following:—"The Birmingham Water Scheme," by Mr. J. Mansergh; "Sanitary Defects in Rural Districts: Remedies," by Mr. G. H. Smith; "Deep-well Boring in Warwickshire," by Mr. J. E. Wilton; "Conservation and Ventilation of House Drainage," by Dr. A. Bostock Hill; "Natural Purification of Sewage," by Dr. Kenwood and Mr. W. Butler; "The Flora of Sewage," by Professor Boyce; "Dwellings of the Working Classes," by Dr. J. F. J. Sykes; "Precautions Observed in the Ventilation of Sewers and Drains," by Mr. T. J. Moss-tower; "Teaching of Sanitation in Elementary Schools," by Mr. E. Dr. "Sanitary Knowledge for Working Women," by Mrs. Wakeford; "Slaughter-houses, in which Continental and English Methods are Compared," by Councillor Parkes, M.P.; "The Removal of Insanitary Areas, and the Management of Improvement Schemes under the Housing of the Working Classes Act," by Mr. Peter Addie (formerly of Birmingham). The Reception and Hospitality Subcommittee reported, with regard to the entertainment of distinguished visitors, that the President of the Congress will be the guest of the Lord Mayor. For the reception of the Congress the Lord Mayor has granted the free use of the Town Hall for the purposes of a reception room. The Council of the Midland Institute have granted the use of the large

lecture theatre on the afternoon of Tuesday, September 27, for the President's inaugural address, and on the evening of Friday, September 30, for the lecture to the Congress, which will be delivered by Dr. C. Chiles. The Council of the Mason University College have also granted the use of rooms in the college for the meetings of conferences and sections. Councillor Lancaster, on behalf of the Excursion Subcommittee, reported that the following excursions had been arranged:—Friday, September 30—(1) To Dudley Castle and caverns; (2) to Whitacre reservoirs and pumping station; (3) to Salford Sewage Farm. On Saturday, October 1, to Stratford-on-Avon, Warwick, and Malvern. Through the kindness of the Earl of Dudley visitors would be received by his lordship's representative, and conducted to the Wren's Nest limestone caverns, which would be reached by boat and water subway. The caverns would be illuminated by limelight, and, after inspecting them, the party would proceed to Dudley Castle. In their report of the arrangements of the exhibition the sub-committee state that they have rented Bingley Hall for a month—that being the only suitable building available. It will be necessary to board over the whole of the floor of the hall, to provide efficient electric lighting, gas for the stall-holders, water and drainage, and to decorate the interior of the hall. It is estimated that the sum of 1,000*l.* allocated for these purposes will be sufficient to cover the total cost.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual summer outing of the Bristol Master Builders' Association was held at Cardiff on Monday. About eighty members formed the party, and after luncheon at the Royal Hotel, a visit was paid to Cardiff Castle. A drive afterwards took place to Roath Park and Llanishen, and Landaff Cathedral was visited, where the party were met by Colonel Sir E. S. Hill, M.P., and the very Rev. Dean Davey, who explained the historical associations of the cathedral. The members were afterwards entertained to tea at Rockwood, and subsequently had dinner at the Royal Hotel, where they were joined by a number of Cardiff builders. After dinner the health of "The Queen and Members of the Royal Family" was honoured. Mr. G. H. Perrin then proposed "The West of England and South Wales Federation of Building Trade Employers." He remarked that the trade in Bristol had passed through an ordeal, and the difficulty was not yet quite settled. Mr. Symons (President of the Federation) responded, remarking that the organisation had been established a little more than twelve months, and there was a great work for it to do. They believed in an equitable arrangement between employers and men, and they therefore were friends to arbitration; if a man refused to accept arbitration he must have a poor case. They adopted it themselves and believed in it for builders and architects. Mr. Krauss also spoke to the toast. He said they had not yet settled the matter with the bricklayers, but he hoped the men would soon agree to arbitration. Mr. Lethbridge (Plymouth) likewise responded. The toast of the "Visitors" was submitted by Mr. F. N. Cowlin, and responded to by Messrs. Frank Willis, T. M. Jenkins (Neath), and J. Turner (Cardiff). The services of Mr. H. J. Spear in connexion with the outing were recognised, and the party soon after returned to Bristol.

BUILDING TRADES EXCHANGE, NEWCASTLE.—On the 10th inst. the Newcastle, Gateshead, and District Building Trades Exchange was opened by the Mayor of the City (Alderman T. B. Sanderson) at the Exchange, 62, Grainger-street. Premises have been secured in connexion with the Arts Club. There is a large room for use as an Exchange, in which are placed trade papers, maps, &c., other rooms for the exhibition of samples; and also a room for the holding of business meetings. Mr. John George Walker, the President of the Exchange, presided at the opening ceremony, and in opening the proceedings said the idea of the Exchange was imported from America by Col. Bennett, of Glasgow, who, on his visit to America, found successful Exchange changes in most of the large cities of the United States. Through Col. Bennett's efforts an Exchange was founded in Glasgow three years ago, and that had been followed by others in Edinburgh, Halifax, and elsewhere. Both in Glasgow and Edinburgh the Exchanges had been officially recognised. The objects of the Exchange were to advance the interests of the trades associated with the building industry. At that place architects, builders, and merchants would meet together and would have opportunities for the ready transaction of business. The settlement of controversies and misunderstandings would also be undertaken, the technical study of the building trade would be promoted, and Parliamentary and municipal legislation would be supported. The Exchange did not propose to participate in trade disputes and contests. They desired to raise the standard of work and to strengthen public opinion in the aims and objects of their members. They would discourage shoddy work of all kinds and encourage those who, for fair remuneration, were willing to do honest work. The Mayor said that if the Exchanges had been successful in Newcastle, the Council had referred to, there was no reason why that one should not be successful in Newcastle. With regard to projected town improvements, the Council had a very long agenda, and he hoped the scheme before the Council would



be adopted, because he must say they had not been so forward in carrying out schemes of the kind as they would have liked. He thought the Exchange should be of great value, and he had pleasure in declaring it open.

**THE STRAND IMPROVEMENT.**—Mr. James Green, the valuer appointed by the Local Government Board, continued on Tuesday last week his inquiry as to the value of the land and buildings in the "betterment" area of the London County Council's Strand improvement scheme. The first case was that of the Strand Hotel-buildings, the property of F. E. H. Fowler and others. Mr. T. E. Scrutton appeared for the claimants, and the Hon. Alfred Lyttelton, M.P., for the County Council. Nos. 1, 2, and 3 are freehold houses and shops, let on lease at 365*l.* per annum, and containing an area of 807 ft. Mr. Robert Reid, of Great Marlborough-street, estimated the present value at 510*l.* per annum, and the value of the freehold in possession at 13,500*l.*, of which he fixed 2,660*l.* as the value of the buildings and 10,840*l.* of the land. The five freehold houses and shops, Nos. 5, 6, 7, 8, and 9, Strand Hotel-buildings, containing an area of 1,762 ft., are let on lease at a rental rising from 610*l.* to 720*l.* Mr. Reid estimated the yearly value at 1,050*l.*, and the value of the freehold in possession at 26,250*l.*, 5,241*l.* for buildings and 21,008*l.* for land. No. 10, Strand Hotel-buildings, a house and shop, with an area of 503 ft., is let on lease at 140*l.* per annum. Mr. Reid estimated the yearly value at 210*l.*, and the value of the freehold in possession at 5,250*l.* for buildings and 4,004*l.* for land. Mr. Andrew Young, the valuer of the Council, and Mr. G. H. Wilkinson valued the whole of the freehold property, Nos. 1 to 10, at 1,205*l.* per annum, and at twenty years' purchase, less deductions, at 23,817*l.* The land they valued at 3*l.* per acre. The leasehold, a house, shop, and buildings, No. 11, Strand Hotel-buildings, are held under a lease from the vicar and churchwardens of St. Giles, Cripplegate, for eighty years from 1803, at a ground-rent of 85*l.* per annum, and are underletted to the Earl of Kilmorey for the whole term at a rental of 230*l.* per annum. Mr. Reid valued the property at 380*l.* per annum, and the freehold in possession at 5,000*l.* Mr. A. Young valued the lessee's interest at 1,287*l.* The last case was that of chambers over 39 and 40, Wych-street, the property of Mr. Wright. No evidence was offered for the claimant. The premises are leased for a term expiring in 1916 at 75*l.* per annum, sub-let for the whole term at 95*l.* Mr. Young valued the lessee's interest at 201*l.* and the freeholder's interest at 1,628*l.* The inquiry was then adjourned till October 25.—*Times*.

**ENGINEERING TRADES REPORT.**—Messrs. Matheson & Grant, in their half-yearly report, state that the engineering trades in Great Britain have been more than usually prosperous for a period now approaching three years, and there is as yet no sign of retraction. The unfortunate strike of the operative engineers, although it had for some time stopped work in certain branches and curtailed the operations of others, has not been entirely without compensation, for it has, by the truce agreed upon, left employers and workmen free alike to reap the full advantage of the present demand for engineering material. Although there has not everywhere been an actual rise of prices, the greater output has in all cases allowed a beneficial increase of profits. In the direction of foreign trade there is keen competition between British and German engineers on the one hand and American engineers on the other to supply the needs of Japan. American competition is showing more strongly than heretofore, not only in Great Britain and in Japan, but in the Colonial markets, especially in mining-plant, electrical appliances, and machine-tools; and, except on our home railways, in locomotives and rolling-stock also. It does not follow that this competition will be permanent, for it is largely due to an exceptional combination of circumstances, namely, that the British workshops are full of orders, and that the American works, having a capacity much beyond their present home demand, there is a willingness of makers there to sell at lower prices for export than at home. Iron and steel have not advanced in price so much as have the finished products of the trades which consume these materials, for there seems to be a wide scope within which the blast-furnaces and the manufacturing plant can increase their output. Steel bridges and structural work are in full demand, but although there is now sufficient occupation to prevent the unremunerative low prices of recent years, there is not such an excessive demand as to raise rates so greatly as in most other branches of the engineering trades. The use of steel for building is increasing, and, although on a less ambitious scale than in America, it is evident in both countries that the cheapness and variety of rolled sections of steel is tending to supersede cast iron for columns and other parts exposed to compressive stresses. The numerous and various trades coming under the category of electrical engineering continue to increase and extend. In regard to electric lighting the experience of the last few years, in this country, shows that the rates ranging from 6*d.* to 8*d.* per Board of Trade unit, permitted in public schemes, allow a more than ample profit, and not only are such enterprises profitable, but municipalities are to an increasing extent, taking the control of them. Motor cars continue to exercise the attention of

engineers in Great Britain and in France, but at present few of such cars, other than cabs, have been seen in public. What appears to be a greater progress in France than in England in this branch of engineering, seems to be due to the greater, but more dangerous use of benzoline or other volatile oils, which are not favourably regarded here. The great revival in the Portland cement trade, which was noticed in the January report, has been fully maintained, any change being in the direction of an even greater demand. Prices which had risen 25 per cent. during 1897, show no sign of decline.

**NEW ROAD, OSBORNE.**—On the 23rd inst. the Queen opened a new road, which she has given to the East Cowes Urban District Council in exchange for one that authority has made over to her Majesty for private use. The road given up by the Council, and by virtue of the fiat of the Court of Quarter Sessions at Winchester, abuts the boundary wall of the Osborne Palace grounds, and runs from the Queen's private entrance to the Prince of Wales's entrance. It forms one side of an oval, the other side being the main road between Cowes, Whippingham, Wootton, and Ryde. The road thus made over to her Majesty is a little under 500 yards long, with no side walks except for a portion of the way. The Queen gave in exchange a plot of land twenty-two acres in extent, and caused to be cut out, metalled, and made at her own expense, a road leading from Victoria-grove to Whippingham-road, thus opening up a shorter thoroughfare between the two thoroughfares. This new road is 500 yards long by 50 ft. in width. The surplus land comprised in the 22 acres has been dedicated to the use of the inhabitants as a recreation ground, and covers an area of about 13 acres. The Queen has also notified her intention to have an avenue of trees planted on either side of this new road.

**THE LARCH WOODS.**—On the 23rd inst. the Duchess of Albany visited Highgate for the purpose of opening the Queen's Wood. The wood consists of 52 acres of timbered land. Hitherto it has been known as Churchyard Bottom-wood. The paths have been remade, and the lower portion of the wood has been drained and the direction of Mr. Lovestock, the Engineer and Surveyor of the District Council.

**YARMOUTH ELECTRIC LIGHTING.**—A Local Government Board inquiry was held at Yarmouth on the 22nd inst., relative to an application for a loan of 4,800*l.* for an extension of the electric lighting system in Yarmouth. In the course of evidence it was stated that 33,000*l.* had already been spent for electric lighting in Yarmouth. There was no opposition to the application for the loan.

**THE DEMOLITION OF THE EDINBURGH GASWORK CHIMNEY.**—As the work in connection with the demolition of the tall chimney stalk at the New-Street Gasworks is now in hand, and the consequent removal of an eye-sore from the Princes-street valley, a few memorial particulars with regard to the stalk may be of interest. The chimney was built in the year 1845, and was designed by Mr. Mark Taylor, Engineer to the Company. Mr. George Buchanan, civil engineer, and Professor Gordon, architect of Glasgow, were also consulted. The stonework was built by Mr. James Gowan, Edinburgh, and the brickwork by Mr. James Bow, of Pollockshields, near Glasgow. The total height of the chimney is 329 ft. from the ground line. The stone pedestal is 30 ft. square and 65 ft. high. The brick shaft is circular, 26 ft. 3 in. diameter at the bottom, tapering to 15 ft. diameter at the top, and the inner barrel is 22 ft. 6 in. diameter at the bottom, tapering to 12 ft. diameter at the top. The total weight of materials forming the chimney is estimated at about 4,000 tons, there being some 32 tons of ironwork forming the top capping. The contractor for the removal is Mr. W. J. Furse, of Nottingham. The refuse material is to be utilised in the concrete for the building of new Gasworks at Granton.—*Edinburgh Evening Dispatch*.

**FIRE AT BUILDERS' PREMISES.**—A fire occurred a few days ago at the premises of Messrs. Higgs, builders and contractors, Station Works, Loughborough Junction.

**NORTHERN COUNTIES FEDERATION OF BUILDING TRADE EMPLOYERS.**—The quarterly meeting of the Northern Counties Federation of Building Trades Employers has just been held in Newcastle. The representatives of the affiliated associations were met at the Central Station by the President and committee of the Newcastle, Gateshead, and Tyne District Master Builders' Association, and were then conducted to the rooms of the Building Trades Exchange, where the meeting of the executive board was held. It was decided to hold the next quarterly meeting at South Shields. The representatives were entertained to dinner at the Arts' Club at the invitation of the Newcastle Association. A meeting of the members of the affiliated associations was afterwards held in the meeting room of the Exchange. Mr. Walter Lowry, the President of the Federation, presided, and was supported on the platform by the Vice-President (Councillor D. Ranken, Sunderland), and the Presidents of the various Associations. The President said although it was only a short time since the Federation was formed they would be glad to hear that three new master builders' associations were being formed in districts which hitherto had not had any, and these had expressed a wish to join the Federation, and it was also a most pleasing fact to learn that the membership of the individual master builders'

associations connected with the Federation was steadily increasing in numbers, one association in particular having nearly doubled its membership during the last month or so. The work of the Federation was being carried on in a most efficient manner, and the associations in different parts was the outcome of the fact that employers were finding out that combining together was the only method by which they could successfully protect the interests of their trade and business. Trade unionism in its proper sense was all right, but it was from the new unionism, which seemed to have lost its objects the restriction of output, the restriction of working hours, and restriction in the number of apprentices, that he felt that grave and disastrous results to trade in general would be the only outcome. The restriction in some trades of the number of apprentices was a most serious matter, the chief object of which was undoubtedly to keep up the high standard of wages by making the supply less than the demand, and such restrictions as these had a very unfair and evil effect upon the mass of the working population. The interests of master and man were identical, for who would be ruinous to one must necessarily in time be ruinous to the other, and thus it behoved each side to weigh carefully any question or dispute so that it might not have a disastrous effect on trade in general. The rules of the Federation were conciliatory to the workmen, and its objects were for the general benefit of the trade, both to masters and men, and to endeavour to raise the building trade to the high position it should occupy in the trade of our country. He would like to say a few words about the Workmen's Compensation Act, which came into operation on July 1, and the far-reaching consequences of which had caused astonishment to employers of labour. Employers had to face almost unlimited liability, and there was little doubt that the Act might bring ruination on many small builders should they be so unfortunate as to have a series of accidents. He was surprised to learn that some builders were not insured, and would advise them to at once have their liability covered in a good office, although they would have to pay a much larger premium under this new Act than they had previously paid. The President then read a paper on "The Advantages of Federation, &c." Councillor Ranken, Sunderland, said that he felt sure the members would fully agree with the remarks of the President. He fully endorsed what had been said, and felt there was little doubt but that federation would conduce very materially to the stability of trade. Mr. Davison, Stockton, said he fully agreed with what had been said with regard to federation. On the motion of Mr. Burnett, Birley, seconded by Mr. Shields, South Shields, a vote of thanks was accorded to the President for his address.

**PALACE THEATRE, PLYMOUTH.**—On the 23rd inst. a gathering of members of the local Architectural Society assembled at the Palace Theatre, Plymouth, to witness a show rapidly approaching completion, in the Union-street. Amongst those present were Messrs. H. G. Luff, A. E. Lethbridge, William N. Richards, R. H. B. Neal, F. A. Wible, A. S. Parker, R. A. Mill, J. H. Dweley, B. Priestley Shires, S. Roberts, jun., &c. The party were met at the entrance by Messrs. J. T. Wimperis and Arber's representative, Mr. J. T. Wimperis, who explained the works and explained the general arrangements. On the conclusion of the visit the architects for the building, and Mr. Sprague, their representative, were heartily thanked on the proposition of Mr. E. A. Lethbridge, seconded by the Hon. Secretary, Mr. B. Priestley Shires.

## CAPITAL AND LABOUR.

**BRISTOL BUILDING TRADE.**—On the 10th inst. the Bristol Master Builders' Association received from the Bricklayers' Society a letter, in which they state they have decided to still maintain their demands previously submitted, and that they have now only two points of difference with the Association—(1) in respect of wages; and (2) walking time. With reference to walking time, the master builders, after considering this letter, failed to see where the difference existed, in the face of the following amended rule submitted to the Board of Trade arbitrator, and approved of by the federated trades and the masons and masters:—"That the walking time be allowed at the rate of three miles per hour outside the boundary of Bristol. The boundary to be taken at a radius of two miles from St. Philip's station, a centre, and to include Blackboy Hill, Upper Belgrave-road, to the Suspension bridge. This rule applies only to men sent from the shops into the boundary, and not to men engaged and paid at the job." It was arranged for the operative masons to sign the amended rule on the 10th inst. The federated trades were supplied, by post, with copies of the rules for signature, so that when the whole of the proceedings are completed the only outstanding difficulty will be that with reference to the bricklayers, which it is hoped will be speedily brought to a termination.—*Bristol Mercury*.

**SUNDERLAND BUILDERS' WAGES.**—The builders' labourers at Sunderland who are members of the National Amalgamated Union of Labour recently applied for an advance of wages. At one time it seemed a prospect of a protracted work, but settlement has been effected, the Master Builders'



of 1/4d. per hour increase, bringing the pay up to 6 1/2d. per hour, having been accepted by the men. JOINERS' STRIKE AT BISHOP AUCKLAND.—The joiners of Bishop Auckland have acceded to the reduction of their wages, and their working hours are reduced from fifty-three to fifty hours per week. They also offer 1/4d. per hour advance, making the standard rate of wages 8d. per hour.

## LEGAL.

## IMPORTANT BUILDING DISPUTE AT SCARBOROUGH.

THE case of Clarke v. Waddington came before Mr. Justice Romer in the Chancery Division on the 26th inst., in which Mr. Levett, Q.C., moved for an injunction to restrain the defendant from building a breach of certain restrictive covenants, and, as the question turned on the covenants, it was agreed to treat this motion as the trial of the action. It appeared that the plaintiff was the owner of an estate at Scarborough, and was the successor in title to a Mr. John Skelton. The portion of the estate in regard to which the present proceedings were taken was conveyed to Mr. John Skelton by the defendant, and upon that had been erected the Lonsborough Theatre. It was in respect of this theatre that the plaintiff said the breaches of the covenant had been committed. One of the covenants was that the defendants should not erect any other building beyond those agreed upon without the consent of the owner of the estate.

That the defendant intended to erect certain other steps up an exit at the back. That was one breach, and a second was in respect of a door, there was a door 3 ft. 6 in. wide which the defendant had enlarged to 4 ft. 6 in., and this was proposed to be used as an exit. This exit in the enlarged form would, it was said, become an intolerable nuisance to the plaintiff's tenants, whose backs the audience would pass.

Mr. Justice Romer, after reading the covenants, did not notice that the elevation was not to be altered, and that seemed to imply that so long as a wall was not done mere alterations in the ground and other parts of the building might be altered provided that the alterations were not substantial; therefore he thought it must be shown that what was being done was a substantial alteration, and amounted to the erection of a separate building.

Mr. Levett contended that without the consent of the owner, according to the covenants, the building must be in accordance with the plans, elevations, and specifications, to be approved in writing, and that they were not allowed to open any door or window in any place the plaintiff did not approve. By the alteration of the door the defendant had done a most substantial alteration, and therefore in that had committed a breach of the covenant.

Mr. Farwell, Q.C., said that what was meant by the covenants was that no substantial alteration should be made, and he submitted that the substitution of stone steps for iron steps, and the widening of the door by about 1 ft., were not such substantial alterations as was intended by the covenant.

Mr. Justice Romer said that what motive the plaintiff might have in bringing this action he was not concerned with, and the only question before him was as to the construction of the covenants with reference to the matters complained of. In the deed of conveyance there was a covenant by the defendant for the erection of certain buildings, and it contained these words: "Also that no other place of amusement, shop, building, entrance gate, wall, or fence shall at any time be built or erected upon such piece of land, except with the approval" mentioned in the deed. He agreed that the word "building" must have a reasonable interpretation, and it was not every trifling alteration of the premises that was meant by a "building" within the meaning of the word so used in the covenant. At the same time, he did not see any reason for unduly restricting the meaning of the word "building". The question was, did the steps which had been erected amount to a "building" within the meaning of the word in the covenant? Seeing they were in substitution of what before was an iron door it appeared to his lordship that these steps amounted substantially to a "building", and therefore that it was a breach of the covenant. In the deed of conveyance there was a further covenant that the elevations should not be altered without consent in writing, but the use of the word "elevation" owed it was not confined to the front elevation.

His lordship's opinion, a very important part of the elevation was the size and position of windows and doors and an alteration of a substantial character the size or position of the windows, with entrances the front or sides of the building, would be a breach of the covenant. The doorway to which his lordship had been called was in one of the elevations, and, in his opinion, the alteration which had been made was a substantial one, and he therefore held that that also was a breach of the covenant.

Mr. Levett said that the really substantial question was that the door should not be used as a general exit, but there would be no objection to its being used on an emergency.

His lordship then made a declaration that what had been done was a breach of the covenants, with liberty to apply for an injunction; the defendant pay the costs.

Order accordingly.

## THE BUILDING OF THE TIVOLI THEATRE, MANCHESTER.

AT the Manchester Assizes, on the 21st inst., before Mr. Justice Ridley, sitting without a jury, James Stott (trading as James Stott & Co.), gas-fitting manufacturer, Manchester and Oldham, brought an action to recover 99l. 3s. for goods supplied and work done, from Mr. Harry Percival, of London, architect of the Tivoli Theatre. Mr. Sutton appeared for the plaintiff and Mr. Crauford for the defendant. The claim arose out of an order given to the plaintiff to fix certain gas-fittings at the Tivoli Theatre of Varieties. The plaintiff, said Mr. Sutton, undertook to do the work for 10s., and the defendant signed the contract without indicating that he held so as agent, or otherwise than as principal in the matter. He therefore apprehended that it was not open for the defendant to dispute his liability. The facts were that this was a theatre being built by a contractor for a company, both of whom repudiated liability, and as there was no contract between plaintiff and either of them he now sought to recover from the defendant, who had made himself personally liable. Plaintiff gave evidence bearing out counsel's opening statement. In cross-examination, he said he believed his firm's account for the work was made out to the Tivoli Theatre.

Mr. Crauford: What do you mean by asking Mr. Percival for a certificate for work done if he was personally liable?

Plaintiff: Because it is the custom. We naturally looked to the Tivoli, but they repudiated it, and so we then looked to the architect.

The Judge, after further evidence had been given, asked counsel for the defence whether he said that because his client had applied to the Tivoli for payment or to the defendant for a certificate that that would prevent him suing on the contract.

Mr. Crauford replied that his case was that plaintiff had been informed that defendant was only architect, and was incurring no personal liability.

His Lordship: I can't help that; if he signed this contract afterwards he is answerable for it. He should take care how he writes his letters. According to all the rules as I understand he is answerable on this contract, and his writing to the company does not deprive the plaintiff of his right to recover from the defendant.

The defendant said that when the goods were ordered the plaintiff's representative was told that they must be invoiced to the builders of the theatre, and that he (defendant) was acting for the Tivoli Theatre. He never said or did anything to indicate that he was making himself personally liable, and it was known that he was architect of the theatre.

Mr. Crauford: If parties know that you are the architect when you sign an order, is it understood that you are not personally liable? Yes.

His Lordship: Then the architect ought so to sign his orders. Had you signed in your capacity as architect you would not have been here now. The omission to do makes all the difference. On the face of it this is a perfectly good contract.

Mr. James Kiddock, the builder of the theatre, said that if Messrs. Stott had applied to him for payment he would have given them a bill or done his best to pay them in some shape or form. He had never denied or disputed his liability to them. He had an action pending against the Tivoli Company for work done, and included in the claim was the amount due to the plaintiff.

Mr. Crauford argued that, if at the time the contract was entered into, it was understood that the defendant was merely the architect, and was not making himself personally liable, even if the acceptance was in his name without qualification, that did not make him personally liable, because it was not good faith for the other party to take advantage of the omission when he knew perfectly well that the defendant was acting as architect, and was not himself undertaking any responsibility. He quoted authorities in support of his contention.

His Lordship said that in this case there was a contract which was clear and distinct, and he said without any qualification at all that Mr. Percival was the person who gave the order, and was therefore liable for the work. According to the ordinary rules of construction, Mr. Percival was liable upon the document, and the plaintiff was entitled to regard the defendant as having made the contract. The introduction of two or three words would have saved his liability, but as they were not there, there must be judgment for the plaintiff with costs.—Manchester Evening News.

## ANCIENT LIGHTS DISPUTE AT BROMLEY.

MR. JUSTICE BYRNE, in the Chancery Division, on the 26th inst., concluded the hearing of the case of Brown and others v. Collings, an action brought by Mrs. Ellen Elizabeth Brown, the Rev. John Thomas Brown, and Mr. Charles Webb, the owners in fee simple of certain dwelling houses known as Nos. 83, 84, 85, and 86, High-street, Bromley, Kent, and by Jane Lynes, the lessee of No. 83, Elizabeth Deane, the lessee of No. 84, and Mr. Isaac Kenton, the lessee of Nos. 85 and 86, for an injunction to restrain the alleged infringement of ancient lights. There was an alternative claim for damages. It appeared that in the rear of the plaintiffs' premises and facing towards and looking over the defendant's land were sixteen alleged ancient windows, and in October, 1896, the defendant pulled down a low shed of about 10 ft. high, which was formerly on his land, and commenced the erection of a warehouse which the plaintiffs said would, if completed according to the defendant's plans, materially diminish the access of light as previously enjoyed through the windows in question. The plaintiffs complained of this, but notwithstanding that, it was alleged that the defendant persisted in proceeding with his building until November 19, 1896, when he gave an undertaking not to raise it higher, and on December 16 an interlocutory injunction was granted. The plaintiffs' case was that the defendant's building, even at its present height, materially obstructed the access of light to their premises. The defendant by his defence did not admit that the plaintiffs' lights were ancient, and also that his new buildings now, or when completed, according to his plans, would materially, or at all, diminish the access of light to their windows. He said that the north-east wall of his new building, facing the plaintiffs' premises would be 32 ft. high, and no more, and the extreme height from the ground to the top of the gable would be 44 ft. and no more, and that such wall was from 60 ft. to 70 ft. distant from the plaintiffs' windows. The defendant further said that the plaintiffs had themselves, within the last few years, materially diminished the access of light to the said windows, or some of them, by raising and prolonging certain back additions in the rear of and at right angles to the houses, and that if his (the defendant's) building did or would, when completed, in any degree diminish the access of light to the windows, such diminution would not but for the plaintiffs' own acts be sufficient to give the plaintiffs any cause of action.

His Lordship, after hearing a great amount of evidence, came to the conclusion that the plaintiffs had failed to make out that the defendant's building as threatened to be erected would cause such a material diminution of light to their windows as to entitle them to an injunction. The result was that the action failed and must be dismissed with costs. Leave to appeal was given.

Mr. Eve, Q.C., and Mr. Charles Crawley appeared for the plaintiffs, and Mr. Astbury, Q.C., and Mr. Dunham for the defendant.

## PLYMOUTH BUILDERS AND THE DORSET COUNTY COUNCIL.

THE case of Pethick Bros. v. the County Council of Dorset came before the Court of Appeal composed of Lords Justices A. L. Smith, Kigby, and Vaughan Williams, on the 27th inst., on the appeal of the County Council from the decision of a Divisional Court of Queen's Bench consisting of Justices Day and Lawrence.

Mr. J. Walton, Q.C., and Mr. Clavell Salter appeared for the County Council, and Mr. C. A. Russell, Q.C., and Mr. Duke for Messrs. Pethick Bros.

Mr. Walton, in opening the case, said the matter came before the Court in the form of a special case stated by the Justices of Dorset; the question being whether Messrs. Pethick Bros. (builders and contractors, of Plymouth), respondents to the present appeal, were liable for the expenses which had been occasioned to certain roads by reason of extraordinary traffic. The Justices held that they were liable, but the Divisional Court held that they were not; hence the present appeal by the County Council. The short outline of the facts was as follows:—Messrs. Pethick Bros. were the contractors for doing certain extensive building operations at Chelmsford, being additions to the asylum for pauper lunatics, the contract price being, without extras, upwards of 52,000l. The contract was entered into by Messrs. Pethick Bros. and the Visiting Committee of the Dorset County Lunatic Asylum. Messrs. Pethick made a contract with a man named Trenchard to convey materials from the railway station to the asylum, and the extraordinary traffic in question arose from the carriage of the materials from the railway station to the asylum.

Lord Justice Smith: Was there any definite way for the carriage of the materials laid down by the contract?

Mr. Walton replied that there was no definite route referred to in the contract.

Lord Justice Smith: Do you distinguish this from Lord Gerard's case?

Mr. Walton said that he did. Lord Gerard was held not liable. The learned counsel went on to say that Trenchard did the work by his own carts and by his own servants, and the master who ordered his servants to carry goods, &c., over a route if the traffic was extraordinary, was liable, as the thing was done by his order. That was the case of Lord Gerard, who was building a new house, and he simply bought materials to be delivered at Eastwood Park, and by the terms of that order they were to be delivered to him at Eastwood Park, so that the property in the goods did not pass to him until they arrived at their destination. He gave orders for the goods, but gave no orders for the traffic. All that could be said was that the traffic was at his instance, and for him in the wide and general sense. The present case came between the two extremes, as it was a case in which Messrs. Pethick's materials had to be carted, either by their own



"Flaxland Tach Farm," 20 a. 1 r. 5 p., f. ....	
"Walterstone Farm," 102 a. 0 r. 7 p., f. ....	30
St. Bride's Major, Glamorgan.—"Pool Farm,"	
83 a. 2 r. 6 p., f. and c. ....	5
A copyhold cottage and field, 2 a. 3 r. 2 p. ....	





## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
*Shops and Dwelling Houses.....	Plymouth Town Council	Premium, 2500.	Sept. 24

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Ker. ing, & Cusward.....	St. Germans R.D.C.	F. W. Cleverton, 4, Buckland-terrace, Plymouth.	Aug. 2
Two Houses, Burke Hall-bridge.....	.....	T. L. Pritchard, Architect, George square, Halifax.	do.
Additions to School, Lutton, Herefordshire.....	.....	Rev. E. Babbs, The Rectory, Lutton, South M.I. Co.	do.
Lodge, &c. Church, Abbeydore, Kent.....	.....	W. H. Hill, Archt. South M.I. Co.	do.
*Barns.....	Tottenham U.D.C.	F. E. Murphy, 715, High road, Tottenham.	do.
Landro Talpant School.....	D. Ives	J. R. Morgan, Llanelli.	Aug. 3
Lat Iron Columns, Steel Girders, & Road Improvement Works.....	Littlehampton U.D.C.	W. Brown, Town Hall.	do.
Additions to Infirmary.....	Stoke on Trent Union	J. H. Howard, Bury, Town Office.	do.
Shools, Severn Road.....	Cardiff U.D.C.	James & Co. Archt. 18, St. James's Place, London.	do.
Distemping, &c. at Infirmary.....	Fulham Urban	T. A. Marsh, 75, Fulham Palace road, W.	Aug. 4
Waterworks (Contract No. 7).....	Bradford Corp.	J. Watson, C.E. Town Hall.	do.
Cast Iron Pipes, &c. Reservoir.....	Skipton (York) R.D.C.	A. Redwood, C.E. Bourne, 10, St. Peter's Church, York.	do.
Three Houses, Marham, nr. Norwich.....	W. A. Rigg	C. O. Baker, Archt. Town Hall, Marham, Great Yarmouth.	Aug. 5
Road Works.....	Lancaster C.C.	W. H. Bedford, 10, Bransome St. Preston.	Aug. 6
Road Making, Several Streets.....	Newton-on-Market U.D.C.	W. T. M. E. Earlston, 10, St. Peter's Church, Newton-on-Market.	do.
*Additions, &c. at Chapel.....	Worthington Chapel Committee	F. Gregory, Alexandria St. Bath.	Aug. 8
*Repairs, Alterations, &c. of Sewage Pumps.....	Richford R.D.C.	H. Williams, Office of Public Works.	Aug. 9
Coastguard Station, Dunmy Cove.....	Board of Works (Public Works)	G. R. Bond, Archt. High-street, Rochester.	Aug. 10
Additions to Schools, Walscott.....	Freidbury Sch. Bd.	Stirling & Sewan, 22, 24, Town Hall, Chapel-en-le-Frith.	Aug. 11
Waterworks, Reservoir, & Runford.....	Chapel-en-le-Frith R.D.C.	W. C. Williams, Archt. 25, Southgate, Halifax.	Aug. 11
Houses, Shop, &c. West Vale.....	D. Sykes	.....	.....

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Additions to Factory, Halifax.....	.....	M. Hall, Archt. 29, Northgate, Halifax.	Aug.
*Barns, &c. Templepatrick, Ireland.....	.....	Rev. H. M. Hamilton, Templepatrick, Ireland.	Aug.
*Battery Room, &c. at Electric Station, Bournemouth.....	.....	Shore, 4, 5, Verity.	Aug.
Seven Cottages, The Cross, Ecclefield.....	.....	Gloucester Corp.	Aug.
*Hospital and Buildings connected therewith.....	.....	Gloucester Corp.	Aug.
400 yards Cast-iron Pipes, Culvert, &c. at Bournemouth.....	.....	Gloucester Corp.	Aug.
*Twin U.C. Colours.....	.....	Rusland Ltd. Corp.	Aug.
Scheme for Electric Lighting.....	.....	U.D.C.	Aug.
Houses, Baltham, Devon.....	.....	J. P. Rendell, Sherwood Villa, Baltham.	Aug.
Alterations, &c. at Hospital, Exeter.....	.....	C. J. Collyer, Archt. 50, High-street, Exeter.	Aug.
Shops, Stoke Market.....	.....	Stoke (Staffs) T.C.	Aug.
Cottage Hospital, North Ormsby.....	.....	J. M. Bolton, Archt. 23, Albert road, Middlesbrough.	Aug.
Mission Room, Heale, Lincs.....	.....	J. Tappin, Archt. 29, Heale, Lincs.	Aug.
Schools, Woodhouse (West).....	.....	Handsworth S.B.	Aug.
Additions to School, Burn Cross.....	.....	Reckford Sch. Bd.	Aug.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be delivered.
*Clerk of Works.....	Feelington Union	10/- per annum	Aug. 10
*Through Engineer's Assistant.....	Felkett & Co. Corp.	10/- per annum	Aug. 10
*Surveyor to U.D.C. at Stoke Newington.....	Stoke Newington U.D.C.	20/- per week	Aug. 10
*Assistant at Works Department (Building Branch).....	London County Council	10/- per annum	Aug. 10
*Assistant at Works Department (Engineering Branch).....	.....	do.	Aug. 10
*Quantity Taker, Works Department (Building Branch).....	.....	3/- 10/- per week	Aug. 10
*Architectural Assistant.....	Beckingham U.D.C.	10/- per week	Aug. 10

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, & vii. Public Appointments, pp. xvi, & xix.

ALYTH.—For improvement of farm steading, Mains of Creechies, near Alyth, for Sir James H. Ramsay, Bart., of Banff. Messrs. L. & J. Falconer, architects, Blairgowrie.

James McLeod.....£248 13 Stewart Clark, Alyth.....£140 0

Lewis McDonald.....12 0

Thomas Dolg.....£102 11 Alexander Oatley.....£80 15

Thomas C. Mitchell.....95 6 Alexander Sim, Rattray.....85 0

Thomas Ferguson.....£34 10 Robert Kidd, Blairgowrie.....£57 0

William Templeman.....37 0

Robert Craigie.....£45 0 John Walker.....£35 15 0

Charles Crutcheon.....35 10 Geo. Crutcheon, Alyth.....25 10 0

William Sidney.....£21 0 Alex. Mitchell, Alyth.....£12 13 6

\* Accepted.

ARMAGH.—For the erection of dispensary buildings, for the Board of Guardians. Mr. H. C. Zuckerman, architect, Armagh.—Bright Bros., 58, 60, 62, Patrick McKeena.

Thos. Collier.....£58 0

James McKee & Sons.....75 0

\* Accepted.

B. LAUGH.—For the erection of a house and stable at Balaugh, Norfolk. Mr. J. Inglis Goldie, architect, Highbury House, Theatre-street, North 1.

Downing & Son.....£125 0 John Horn.....£102 15 0

Daws & Son.....130 0 James Evans.....75 0

S. R. Wilkins.....147 0 J. W. Neale.....73 11 0

\* Accepted.

BENHILL-ON-SEA.—For iron main room, for Mr. H. Maull.

W. Harbrow, South Bournemouth.....£174 10

BLAIRGOWRIE.—For alterations to the public school, Blairgowrie, for the Blairgowrie School Board. Messrs. L. & J. Falconer, architects.

Masonry, Joinery, Painting, and Glazing.—W. T. Cost Robertson, Victoria-place, Blairgowrie.....about

Fitting Partitions.—Peace & Son, 10, Manchester

Decks.—The Bennett Furnishing Company, Glasgow.....£150

BOURNEMOUTH.—For making up Alington and Heron Court-roads, Portman-place, and St. John's avenue, Bournemouth. Mr. F. W. Lacey, Borough Engineer and Surveyor.

George Troke.....£409 11 6 Grounds & Newton.....£112 7 1

\* Accepted.

BURN-OF-KILRY (N.B.).—Accepted for the erection of farm-ouse, &c., Coldside Estate. Mr. R. Reid, architect, Blairgowrie.

Masonry.—James Paterson, Dalrymple, Glenista.....7 6

Joinery.—Thomas Dolg, Rattray, Blairgowrie.....20 7 6

Staining.—Geo. Crutcheon, Alyth.....50 0 0

Plastering.—Geo. Kidd, Blairgowrie.....45 0 0

Plastering.—Joseph Bell, Blairgowrie.....33 0 0

BURRELLTON (Perthshire).—For additions to schools, for the School Board of Cargill, Perthshire. N.B. Messrs. L. & J. Falconer, architects.

Quantities by the architects.—Messrs. James Bruce

Joinery.—William Scott.....£140

Staining.—John Doug.....£140

Staining.—Geo. S. Mann.....£140

Joinery.—Peter Donaldson

(All of Cargill Angus)

CAEDRAW (South Wales).—For iron schoolroom, for Mertyh

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

W. 1480 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256, 1/512, 1/1024, 1/2048, 1/4096, 1/8192, 1/16384, 1/32768, 1/65536, 1/131072, 1/262144, 1/524288, 1/1048576, 1/2097152, 1/4194304, 1/8388608, 1/16777216, 1/33554432, 1/67108864, 1/134217728, 1/268435456, 1/536870912, 1/1073741824, 1/2147483648, 1/4294967296, 1/8589934592, 1/17179869184, 1/34359738368, 1/68719476736, 1/137438953472, 1/274877906944, 1/549755813888, 1/1099511627776, 1/2199023255552, 1/4398046511104, 1/8796093022208, 1/17592186044416, 1/35184372088832, 1/70368744177664, 1/140737488355328, 1/281474976710656, 1/562949953421312, 1/1125899906842624, 1/2251799813685248, 1/4503599627370496, 1/9007199254740992, 1/18014398509481984, 1/36028797018963968, 1/72057594037927936, 1/144115188075855872, 1/288230376151711744, 1/576460752303423488, 1/1152921504606846976, 1/2305843009213693952, 1/4611686018427387904, 1/9223372036854775808, 1/18446744073709551616, 1/36893488147419103232, 1/73786976294838206464, 1/147573952589676412928, 1/295147905179352825856, 1/590295810358705651712, 1/1180591620717411303424, 1/2361183241434822606848, 1/4722366482869645213696, 1/9444732965739290427392, 1/18889465931478580854784, 1/37778931862957161709568, 1/75557863725914323419136, 1/151115727451828646838272, 1/302231454903657293676544, 1/604462909807314587353088, 1/1208925819614629174706176, 1/2417851639229258349412352, 1/4835703278458516698824704, 1/9671406556917033397649408, 1/19342813113834066795298816, 1/38685626227668133590597632, 1/77371252455336267181195264, 1/154742504910672534362390528, 1/309485009821345068724781056, 1/618970019642690137449562112, 1/1237940039285380274899124224, 1/2475880078570760549798248448, 1/4951760157141521099596496896, 1/9903520314283042199192993792, 1/19807040628566084398385987584, 1/39614081257132168796771975168, 1/79228162514264337593543950336, 1/158456325028528675187087900672, 1/316912650057057350374175801344, 1/633825300114114700748351602688, 1/1267650600228229401496703205376, 1/2535301200456458802993406410752, 1/5070602400912917605986812821504, 1/10141204801825835211973625643008, 1/20282409603651670423947251286016, 1/40564819207303340847894502572032, 1/81129638414606681695789005144064, 1/162259276829213363391778010288128, 1/324518553658426726783556020576256, 1/649037107316853453567112041152512, 1/1298074214633706907134224082305024, 1/2596148429267413814268448164610048, 1/5192296858534827628536896329220096, 1/10384593717069655257073792658440192, 1/20769187434139310514147585316880384, 1/41538374868278621028295170633760768, 1/83076749736557242056590341267521536, 1/166153499473114484113180682535043072, 1/332306998946228968226361365070086144, 1/664613997892457936452722730140172288, 1/1329227995784915872905445460280344576, 1/2658455991569831745810890920560689152, 1/5316911983139663491621781841121378304, 1/10633823966279326983243563682242756608, 1/21267647932558653966487127364485513216, 1/42535295865117307932974254728971026432, 1/85070591730234615865948509457942052864, 1/170141183460469231731897018915884105728, 1/340282366920938463463794037831768211456, 1/680564733841876926927588075663536422912, 1/1361129467683753853855176151327072845824, 1/2722258935367507707710352302654145691648, 1/5444517870735015415420704605308291383296, 1/10889035741470030830841409210616582766592, 1/21778071482940061661682818421233165533184, 1/43556142965880123323365636842466331066368, 1/87112285931760246646731273684932662132736, 1/174224571863520493293462547369855324265472, 1/348449143727040986586925094739710648530944, 1/696898287454081973173850189479421291061888, 1/1393796574908163946347700378958842582123776, 1/2787593149816327892695400757917685164247552, 1/5575186299632655785390801515835370328495104, 1/11150372599265311570781603031670740656990208, 1/22300745198530623141563206063341481313980416, 1/44601490397061246283126412126682962627960832, 1/89202980794122492566252824253365925255921664, 1/1784059615882449851325056485067318505118432, 1/3568119231764899702650112970134637010236864, 1/7136238463529799405300225940269274020473728, 1/14272476927059598810600451880538548040947552, 1/28544953854119197621200903761077096081895104, 1/57089907708238395242401807522154192163790208, 1/114179815416476790484803615044308384327580416, 1/228359630832953580969607230088616768655160832, 1/456719261665907161939214460177233537310321664, 1/913438523331814323878428920354467074620643328, 1/1826877046663628647756857840708934149241286656, 1/3653754093327257295513715681417868298482573312, 1/7307508186654514591027431362835736596965146624, 1/14615016373309029182054862725671473193930293248, 1/29230032746618058364109725451342946387860586496, 1/58460065493236116728219450902685892775721172992, 1/116920130986472233456438901805371785541442345984, 1/233840261972944466912877803610743571082884691968, 1/467680523945888933825755607221487142165769383936, 1/935361047891777867651511214442974284331538767872, 1/1870722095783555735303022428885948568663077535744, 1/3741444191567111470606044857771897137326155071488, 1/7482888383134222941212089715543794274652310142976, 1/14965776766268445882424179431087588549304620285952, 1/29931553532536891764848358862175177098609240571904, 1/59863107065073783529696717724350354197218481143808, 1/119726214130147567059393435448700708394436962287616, 1/239452428260295134118786870897401416788873924575232, 1/478904856520590268237573741794802833577747849150464, 1/957809713041180536475147483589605667155495698300928, 1/1915619426082361072950294967179211334310991966601856, 1/3831238852164722145900589934358422668621983933203712, 1/7662477704329444291801179868716845337243967866407424, 1/15324955408658888583602359737433690674487935732814848, 1/30649910817317777167204719474867381348975871465629696, 1/61299821634635554334409438949734762697951742931259392, 1/122599643269271108668818877899469525395903485862518784, 1/245199286538542217337637755798939050791806971725137568, 1/490398573077084434675275511597878101583613943450275136, 1/980797146154168869350551023195756203167227886900550272, 1/1961594292308337738701102046391512406334457773801100544, 1/3923188584616675477402204092783024812668915547602201088, 1/7846377169233350954804408185566049625337831095204402176, 1/15692754338466701909608816371132099250675662190408804352, 1/31385508676933403819217632742264198501351324380817608704, 1/62771017353866807638435265484528397002702648761635217407408, 1/125542034707733615276870530969056794005405297523270434814816, 1/251084069415467230553741061938113588010810595



\* Tenders by T. Cruwys and London School Furniture Co. accepted

**MONTEME-STREIT SCHOOL** Tolington park.—Erection of Junior Mixed Department—  
 J. Loxley & Co. £1,548 10  
 C. S. Williams & Sons 13,447  
 W. Johnson & Co. Ltd. 11,437  
 J. Grover & Son 13,130  
 L. H. & R. Roberts 12,923  
 W. M. Dabbs 12,654  
 C. Cox 12,654  
 E. Lawrence & Sons 12,465

**NECKINGER ROAD SCHOOL** (Bermundsey).—Additional heating—  
 J. Kalloway & Co. Ltd. £127 0  
 C. Davis 185 12 0  
 W. G. Cannon & Sons 79 0  
 Turner & Co. 79 12  
 J. & F. May 79 0  
 J. C. Christie 79 0  
 Berry, Campbell & Co. £58 15 0  
 J. Deane & Sons Ltd. 18 0 0  
 J. Wontner-Smith 57 0  
 Gray & Co. 57 0  
 J. Grundy 57 0  
 C. Neward & Co. 57 0

**OLDRIDGE ROAD SCHOOL** (Baham).—Reconstruction of boiler flue—  
 E. Sugden £103 10  
 Heinemann & Brown 130 0  
 R. E. Williams & Sons 11 0  
 J. Garrett & Son 402 87  
 H. Brown 87

**POOLES PARK SCHOOL** (Upper Holloway).—Additional heating—  
 A. Deagill & Co. Ltd. £472 0  
 E. Oldroyd & Co. Ltd. 397 0  
 Stride & Co. 373 0  
 J. Grundy 3 8 0  
 Matthews & Gates, Ltd. 350 0  
 J. E. Son 1,505 0  
 Russell & Co. 286 10  
 Bates & Pearce 260 0  
 J. Deane & Sons Ltd. 253 10

**POPHAM ROAD SCHOOL** (Johnston).—Additional heating—  
 W. Simmons 14 0  
 J. & F. May 14 0  
 W. G. Cannon & Sons 35 10  
 C. E. Bradley 47 15  
 J. Wontner-Smith 144 10 0  
 G. Davis 35 0 0  
 Sharp, O'Brien, & Co. 17 12 0

**PROSPECT TERRACE SCHOOL** (Gray's Inn Road).—Additional heating—  
 H. C. Price, Lee, & Co. £145 0  
 Comp. Ching & Co. 119 10  
 J. & F. May 14 0  
 C. E. Bradley 119 10  
 G. Davis 144 10 0  
 Sharp, O'Brien, & Co. 8 5  
 H. C. Price, Lee, & Co. 76 0

**RISINGHILL STREET SCHOOL** (Pentonville).—Enlargement, &c.—  
 J. C. Cowell £9,412 0  
 McCormick & Son 7,850  
 L. H. & R. Roberts 7,750  
 J. Smith & Sons 7,750  
 Snowden Bros & Co. £7,743  
 W. Shurmer 7,850  
 G. S. S. Williams & Son 7,754  
 J. Garrett & Son 6,722

**"SHAFTESBURY"** (Tramway Ship).—Duplicate electric plant—  
 Drake & Gorham £1,359 0  
 L. C. Tate 1,361 0  
 Laing, Wharton, & How, Ltd. 1,352 0  
 H. F. Joel & Co. and Potter & Sons United, Ltd. £1,713 0

**SMEED ROAD SCHOOL** (Old Ford).—Sanitary and drainage work—  
 B. Bull £820 0  
 C. S. Williams & Sons 2,445 0  
 Son 2,704 0  
 C. Parker 2,420 0  
 W. Akers & Co. 2,445 0  
 C. Munday & Sons £2,444 0  
 Laithy Bros 2,319 0  
 J. Garrett & Son 2,212 0  
 Johnson & Co. 2,108 10

**SOUTH WALK PARK SCHOOL** (Bermundsey).—Additional heating—  
 S. Mason, Ltd. £584 0  
 E. Oldroyd & Co. Ltd. 188 0  
 W. J. Cooper 198 10  
 Roper & Russell, Ltd. 137 10  
 J. C. Christie 127 0  
 Bates & Pearce £193 15  
 Duffield & Co. 120 0  
 Berry, Campbell, & Co. 119 0  
 Russell & Co. 118 1

**STANLEY STREET SCHOOL** (Deptford).—Enlargement of Deal Centre—  
 Thomas & Edge £400 0  
 E. Proctor 370 0  
 Rice & Son 325 0  
 J. Marshall £1305 322

**STEPHEN STREET SCHOOL** (Lewisham).—System of heating apparatus—  
 J. C. & J. S. Ellis, Ltd. £549 0  
 W. G. Cannon & Sons 459 0  
 H. C. Price, Lee, & Co. 469 0  
 Roper & Russell, Ltd. 469 0  
 Wippell Bros. & Son 415 0  
 J. Grundy 415 14  
 J. Wontner-Smith, Gray, & Co. 397 0  
 Dargue, Griffiths, & Co. 345 15  
 J. C. Christie 344 0

**STOCKWELL ROAD SCHOOL**.—Additional heating—  
 J. & F. May £105 0  
 W. G. Cannon & Sons 103 0  
 C. Davis 98 0  
 W. Simmons 14 0  
 C. E. Bradley 84 0  
 J. Wontner-Smith, Gray & Co. £79 16 0  
 J. Grundy 69 0 0  
 Sharp, O'Brien, & Co. 57 10 0

## C. B. N. SNEWIN

MAHOGANY, WALNUT, TEAK, VENEER, AND TIMBER MERCHANT,  
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
 HATTON GARDEN, and 29, RAY STREET,  
 FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
 TRADEHOUSE, DRY, AND FIT FOR IMMEDIATE USE.  
 Telephone No. 274 Holborn. Telex Address: "SNEWIN, London."

**VICARAGE ROAD SCHOOL** (Finsbury).—Additional heating—  
 H. C. Price, Lee, & Co. £58 0  
 W. G. Cannon & Sons 98 0  
 Stride & Co. 93 0  
 J. Davis £8 0 0  
 J. Grundy 59 8 0

**WALDRON ROAD SCHOOL** (Earlsfield).—Additional heating—  
 J. Eason £105 0  
 Roper & Russell, Ltd. 121 0  
 J. & F. May 193 0  
 Stride & Co. 150 0  
 Comp. Ching & Co. £147 15  
 J. D. Berry & Sons 123 0  
 Sharp & Sons & Co. 115 0  
 Duffield & Co. 96 0

**WESTMINSTER DIVISION**.—Running contract for repairs on schedule—  
 F. Button £31 p.c. on the Schedule of Prices and Addendum.  
 B. E. Nightingale ditto ditto  
 Rice & Son ditto ditto  
 Roper & Russell ditto ditto  
 Johnson & Co. ditto ditto  
 Laithy Bros. ditto ditto

**NEW Pattern Drawing Desk**.—Each.  
 J. Garvie & Sons £7 6  
 G. M. Hammer & Co. 2 4 0  
 London School Furniture Co. 1 11 0  
 H. Boucaud £11 8  
 T. Crumpp 1 9 6

### TO CORRESPONDENTS.

J. S. & Son (Amount should have been stated).—G. B. Limited, S. & C. (Too late, next week).

NOTE.—The responsibility of original articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied direct from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 20s. per annum. Remittances payable to DOUGLAS FOURDRINER should be addressed to the publisher of "THE BUILDER," No. 46, Catherine Street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS (by prepaying at the Publishing Office, 10s. per annum or 4s. 6d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

## HIGH-CLASS JOINERY, LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,  
GREENHOUSES,  
WOODEN BUILDINGS,  
Bank, Office, & Shop Fittings,  
CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## THE BATH STONE FIRMS, Ltd.

BATH.  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

## HAM HILL STONE. DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trank & Son,  
The Doulting Stone Co.).  
Chief Office:—Norton, Stoke-under-Ham,  
Somerset.  
London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallis Lava  
Asphalte Company (Mr. H. Glenn), Office, 42,  
Poultry, E.C.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-rooms,  
granaries, tun-rooms, and terraces. Asphalte  
Contractors to the North Bridge Co. [ADVT.]

## SPRAGUE & CO., Ltd.,

Sole Agents for  
THE "E.R.A." PHOTO, BLOCK CO.  
4 & 5, East Harding-street, Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED  
accurately and with despatch.  
**METCHIN & SON** (ST. GEORGE STREET,  
"QUANTITY SURVEYORS' DIARY AND TABLES,"  
For 1898, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

SLATES, SLABWORK,  
Enamelled Slate,  
Marble,  
Permanent Green Slates.

WORKS:  
Bow, London, E. and  
Aberllefenny, North Wales.  
BRANCH HOUSE:  
37, Victoria-street, Bristol.

## PILKINGTON & CO

(ESTABLISHED 1838),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.  
Telephone No., 2751 Avenue  
Registered Trade Mark.

## Polonceau Asphalte.

PATENT ASPHALTE and FELT ROOFING.  
ACID-RESISTING ASPHALTE.  
WHITE SILICA PAVING.  
SEYSSSEL ASPHALTE.

# BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

### DIRECTORS.

CHARLES CREMER, Esq., Faversham, Kent, Brick Manufacturer.  
R. L. CURTIS, Esq., 120, London-wall, E.C., Brick Manufacturer.  
GEO. H. DEAN, Esq., J.P., of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.  
E. W. GOODENOUGH, Esq., 37, Walbrook, E.C., Brick Manufacturer.  
A. J. KNIGHT, Esq., Rainham, Kent, Brick Manufacturer.  
HY. PACKHAM, Esq., of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.  
A. RUTTER, Esq., of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
J. WILLSON, Esq., J.P., of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
GEO. E. WRAGGE, Esq., of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—E. J. COLEBY, Esq., 148, Gresham House, Old Broad-street, E.C.



## ILLUSTRATIONS.

Examples of American Sculpture: from the Recent Exhibition of the "National Sculpture Society" at New York .....	Double-Page Ink-Photo.
Sketches with the Architectural Association Excursion .....	
Entrance Porch, Castle Bromwich; a Porch in Castle Bromwich Village; Entrance to the Hall, Baddesley Clinton; the Bridge at Bidford; Baddesley Clinton Church; Grimshaw Hall .....	Double-Page Photo-Litho.
Maxstoke Castle; Leicester's Hospital, Warwick; The Priory, Warwick; Cesar's Tower, Warwick Castle; Ram Hall .....	Double-Page Photo-Litho.
Little Wolford; Salford Hall; The Old Falcon Inn, Bidford; Honington Hall .....	Double-Page Photo-Litho.

## Blocks in Text.

Some Capitals in Lincolnshire Bell Towers .....	Pages 118-119	Doorways in Queen-square, Bloomsbury .....	Page 126
Kilpeck Church (from S.E. and Interior Looking East) .....	119	Safety Window-Cleaning Chair .....	131

## CONTENTS.

Some Capitals in Lincolnshire Bell Towers .....	117	Sketches with the Architectural Association Excursion .....	128
The Compulsory Sanitary Inspection of Schools .....	119	Correspondence .....	128
National Competitions of Schools of Art .....	120	The Students' Column: Sound, Light, and Heat—VI .....	129
Notes .....	120	Obituary .....	129
Kilpeck Church .....	121	General Building News .....	129
The Royal Archaeological Institute at Lancaster .....	122	Sanitary and Engineering News .....	131
Competitions .....	124	Stained Glass and Decoration .....	132
Architectural Societies .....	124	Foreign .....	132
Tarred Macadam in the Construction of Roadways in Urban Districts .....	124	Miscellaneous .....	132
Doorways, Queen-square, London .....	125	Legal .....	133
Archaeological Societies .....	125	Meetings .....	133
Engineering Societies .....	125	Recent Patents .....	133
Metropolitan Asylums Board .....	125	Some Recent Sales of Property .....	134
		Tenders .....	137
Books: A. E. Danell's "London Riverside Churches"; Dean Stubbs' "Ely Cathedral Handbook"; "An Address Delivered by William Morris to Students of the Birmingham Municipal School of Art"; "A Guide to the Guildhall of the City of London"; T. Seven's "Law of Employers' Liability and Workmen's Compensation"; J. W. Jarvis and W. J. Wood's "Home and Household Compendium"; P. E. Scrutton's "Electricity in Town and Country Houses"; Commander Lionel Wells' "Manual of Fire Drill"; W. P. Gehard's "Sanitary Engineering"; G. E. Waring's "Street-Cleaning and the Disposal of a City's Wastes"; H. P. Boulton's "Municipal and Sanitary Engineers' Handbook" .....	125		
Books Received .....	126		
Examples of American Sculpture .....	128		

## Some Capitals in Lincolnshire Bell Towers.



AMONG the monuments in this country that are generally termed "Saxon" or "pre-Conquest," a prominent place is taken by the square towers, generally at the west end of

churches, that occur in many parts of England, and are specially common in Lincolnshire. In that county between thirty and forty examples may be counted, differing, of course, one from the other, but all possessing in common features that contrast with what we are accustomed to in Norman work. One example, that of St. Peter's, Barton-on-Humber, is of two distinct dates, the uppermost stage agreeing generally with the rest of the towers in the county, while the lower stories with their long and short quoins, pilaster strips, and baluster shafts, are of a different and earlier character. Broughton-by-Brigg is also in some respects exceptional. Branston, near Lincoln, has an arcade round the lower stage that would in itself be termed Early Norman, while Boothby-Pagnell, which agrees with the others in some pre-Conquest features, has a western doorway of a Transitional type. Some of the tower arches, if taken by themselves, would be pronounced Norman. On the other hand, there are distinct signs either of a date prior to Norman times, or, at any rate, of complete independence of Norman traditions, both in the towers themselves and in the western ends of the churches with which they are connected, and both from their intrinsic character and the chronological problems they present, they form a class of buildings well worthy of the notice that has been bestowed on them. In the present article attention is only directed to one feature of the towers—the capitals, often of curious interest, that surmount the mid-wall shafts in the double belfry openings.

These openings are cut straight through

the walls, and are not recessed after the fashion of advanced Romanesque building. In this feature, and in the absence of buttresses, all the towers agree, and seem to be in this way marked off distinctly from Norman structures. On the other hand the mid-wall shafts are never of the "baluster" type, which is recognised as specially Saxon, but are generally plain and straight sided,\* without tapering or entasis, in section circular or octagonal, and sometimes oblong—that is, measuring more in the direction of the thickness of the wall, a peculiarity agreeing with a feature of some of the caps to be afterwards noticed. In most cases the shafts are provided with capitals, and less frequently with bases, with which feature time has dealt more hardly than with the more sheltered caps. The antiquity of many of the existing capitals is doubtful, and in what follows dependence has only been placed on those examples that bear an unmistakable *cachet* of age.

The capitals here illustrated may be roughly grouped under the two headings "Cubical" and "Volute" caps, and are genuine specimens of native English carving of the middle decades of the eleventh century. We cannot put them earlier because of the distinct and matured Romanesque forms which occur among them, while so many of them are bizarre or helpless in their shape and decoration, or are evidently worked out purely by the "rule of thumb" that they cannot be regarded as the work of a Norman chisel. There is every appearance that they were made for the places they occupy, and in a large number of instances they are only decorated on the outer face and part of the sides, so that we can imagine them being actually carved *in situ*. There is no order of historical succession to be made out of the forms and motives, for though some are primitive and others advanced, the ruder examples are sometimes to be found in towers that would be placed late in the

\* Exceptionally we find at Barton, upper story, north side, a shaft with a double cable moulding banded round it about half way up, and at Gleasthrough, south opening, a cable moulding running down the front of the shaft.

group. In dealing with the caps, however, they may, for convenience sake, be ranged according to an assumed scheme of development, the most primitive being first considered.

Fig. 1, from St. Mary-le-Wigford, Lincoln, might seem of dubious antiquity did not the same form occur in the undoubtedly ancient archway, probably at first a chancel arch, between the tower and church at Broughton, near Brigg, in the same county. It is a rude way of cutting down the square of the top of the cap to the octagon of its base, and in a modified form we find the same device at Boothby-Pagnell, where, however, the chambers are hollow. Some caps at Marton, near where the old Roman road from Lincoln to Doncaster crosses the Trent, exhibit a somewhat helpless procedure by which the square of the abacus is cut down to the round of the top of the circular shaft by starting to slope the sides away like an inverted pyramid, and then rounding the corners off till the form becomes that of an inverted cone. This may be regarded as an uninstructed attempt to deal with a problem that is perfectly solved in the normal cubical cap, which is represented in examples of undoubted antiquity at Clec, near Grimsby (fig. 2). This cubical cap, formed by the interpenetration of a hemisphere and a cube, is doubtless a foreign importation, probably from Germany, where the form becomes common in the eleventh century. In its distinctness and decision of shape and perfect fulfilment of conditions the mediæval cubical cap is as good as any tectonic form of the Greeks, and is the most successful independent invention of the kind that we owe to the Middle Ages. The development of the later subdivided or scalloped cap from the simple cubical type can be followed in the Lincolnshire belfries. At Rothwell, in the Castor district, we find mitred cubical caps, shown in fig. 3, but the tooling on the stone suggests that they may date from a restoration of half a century ago. Such mitring, due to a desire to accentuate the divisions of the mass, would be sure to occur as a stage towards its further partition in the subdivided cubical

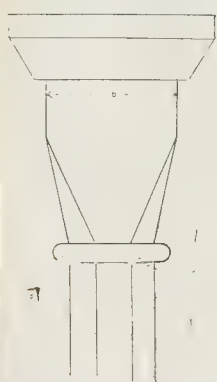


Fig. 1.—St. Mary-le-Wigford, Lincoln. North opening.

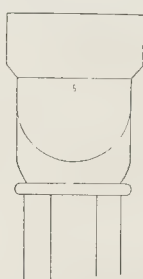


Fig. 2.—Cluc, near Grimsby.

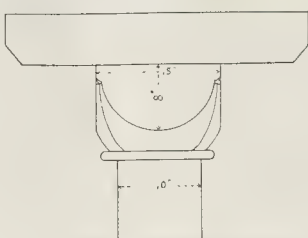


Fig. 3.—Rothwell, near Castor.

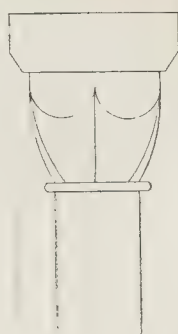


Fig. 4.—Branston, by Lincoln.

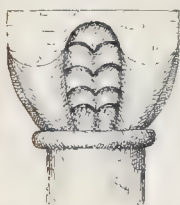


Fig. 5.—Bracebridge, by Lincoln. Side and front views.



Fig. 6.—Bracebridge. South opening; cap and base.

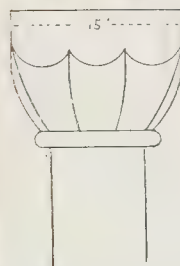


Fig. 7.—Glentworth. East opening; cap from north east.

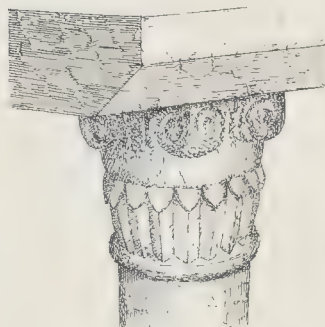


Fig. 8.—Scartho, near Grimsby.



Fig. 9.—St. Peter-at-Gowts, Lincoln. South opening.

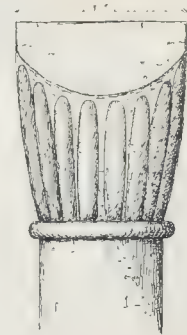
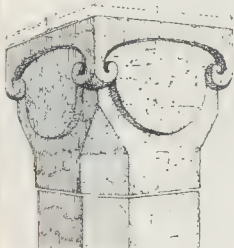


Fig. 11.—Great Hale. West opening; west face of cap.

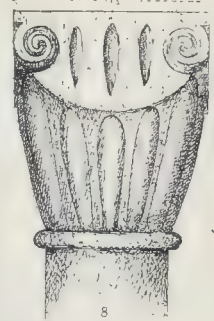


Fig. 13.—Great Hale. East opening; east face of cap.



Fig. 14.—Great Hale. North cap.

caps shown in figs. 4 and 5. The type in which each face of the cap is bounded below by two semicircles instead of one occurs in ancient work at Branston, opening there we find the cap given in fig. 5, by Lincoln (fig. 4). These caps are elegant and well-wrought examples. The further subdivision into three, by which we reach the shape of the familiar scalloped cap, is represented in the tower of the well-known pre-Conquest church of Bracebridge, on the outskirts of Lincoln. In the western belfry of one occurs in ancient work at Branston, opening there we find the cap given in fig. 5, by Lincoln (fig. 4). These caps are elegant and well-wrought examples. The further subdivision into three, by which we reach the shape of the familiar scalloped cap, is

represented in the tower of the well-known pre-Conquest church of Bracebridge, on the outskirts of Lincoln. In the western belfry of one occurs in ancient work at Branston, opening there we find the cap given in fig. 5, by Lincoln (fig. 4). These caps are elegant and well-wrought examples. The further subdivision into three, by which we reach the shape of the familiar scalloped cap, is

represented in the tower of the well-known pre-Conquest church of Bracebridge, on the outskirts of Lincoln. In the western belfry of one occurs in ancient work at Branston, opening there we find the cap given in fig. 5, by Lincoln (fig. 4). These caps are elegant and well-wrought examples. The further subdivision into three, by which we reach the shape of the familiar scalloped cap, is



—or, to use a convenient term familiar in Germany, a tectonic form—is gradually modified by subdivision and by the defining and accentuating of parts. The two dimensions, the square above and the circle below, depend upon structure, and the artistic problem lay in the fitting transition from the one to the other. The transition is, as we have seen, worked out in the Lincolnshire belfries in different ways, though we are not to conclude that the simpler and ruder forms are earlier in actual date than those more artistically advanced.

Hitherto we have dealt with caps of the cubical type. Those which are distinguished by the use of the volute might seem at first sight more artificial, as the volute itself is obviously a borrowed form. The volute, however, as used in these belfries, is only a means of decorating a shape arrived at in the process of construction. The construction in this case is not the same as in that of the normal cubical cap. In the latter, the diameter of the hemisphere that interpenetrates with the cube is equal to the *diagonal* (in plan) of the cube. In the caps now before us (see figs. 6 and 7) the lower part of the cube is worked into the form of a hemisphere of a diameter equal only to the *side* of the cube. This smaller hemisphere is carried round in its full circumference for about half the height of the cap, at which point the corners of the original cube are left projecting. These projections have then to be dealt with, and they are brought down to meet the hemisphere in two ways, of which that shown in fig. 7 is the most common. The cap from Bracebridge, south opening (fig. 6), is notable for its originality. The shaft supporting it possesses, moreover, about the best developed base that occurs in the belfries, the profile of which is given in the drawing. In the Glentworth example (fig. 7), and many others of which specimens are given in the illustrations, the projecting corners of the cube are worked into volutes, while the central space on each face between the curls is left plain, as in fig. 7, or treated with a drop like the so-called Tau of early Norman caps, or some other ornamental motive. Some of these volute caps introduce us to a more elaborate decorative treatment. At Scartho, near Grimsby (fig. 8), the lower part of the capital is surrounded with a ring of upright leaves turned over at the top after a fashion represented in the early Norman crypt at Lastingham, as well as in the crypt of Sta. Trinité, at Caen, Normandy. The richest in ornamentation of all is the cap from St. Peter-at-Gowts, south opening, fig. 9, where there is considerable elegance of design and sharp and delicate cutting. The cap from the upper stage at Barton-on-Humber, south opening (fig. 10), is, on the other hand, clumsy and unpleasing, though undoubtedly original in treatment. It passes off into the octagonal shaft which it crowns, without any neck moulding, though this is almost universal in other examples.

The most interesting set of caps in any of the towers is to be found at Great Hale, near Sleaford, where there are four, all different and all fanciful without being extravagant. This tower is distinguished from all the rest by its possession of a turret stair of stone in the north-eastern angle—evidently an early attempt at such a feature, for it is curiously steep and narrow, about 17 in., and is imperfectly planned, so that it shows as a bulge on the eastern external

face of the tower. The caps are only carved on the outer faces, and they have the peculiarity that the abacus measures rather more in the direction of the thickness of the wall than it does the other way. This gives them some slight approach to the corbel capital, branching out to take the width of the masonry, which occurs in the openings of the Italian Campanili. In shape the Great Hale examples are a sort of combination of the cubical with the volute form, and they are peculiar in the reeding with which the lower part is adorned (figs. 11, 12, 13, 14).

The last example (fig. 15), from the northern face of Glentworth tower, shows the extreme

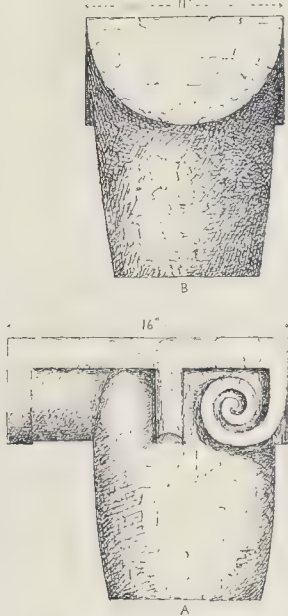


Fig. 15.—Glentworth. North opening; A, east face of cap, B, south face.

limit to which is carried the principle of corbelling out the cap to correspond with the thickness of the wall. This cap measures 11 in. on its face, but the side extends to 16 in. by a curious tongue projecting at the back. This extension is in none of the examples under consideration carried far enough to make it possible to dispense with a through stone, as in the case of the belfry openings at Sompington, in Sussex, where the arrangement resembles that of the Roman Campanili, though the finish of the tower itself is quite unlike anything to be found in Italy.

On the whole it may be claimed that these Lincolnshire caps are well deserving of attention, as they are pretty evidently native work of the Romanesque period not dominated by Norman influence. One can hardly imagine work of the kind being carried out in the neighbourhood of Lincoln when Remigius' Norman masons were executing such thoroughly normal and business-like tectonic work on the west front of the cathedral. The Normans checked the development of native talent in England and fashioned all work after their own patterns. These Lincolnshire caps, whenever they were cut, were handled by men who had not come

under the predominant foreign influence, and without claiming for them or for the towers to which they belong any extravagantly early date, they may be put down safely as pre-Conquest, at any rate in style, if not in every case pre-Conquest in actual time.

#### THE COMPULSORY SANITARY INSPECTION OF SCHOOLS.

THE question of the compulsory sanitary inspection of buildings which are used in some ways other than as mere private dwelling-houses is one which is becoming more and more important. The trend of public opinion appears fortunately to be in favour of such inspection, but up to the present time what may be called a general power of sanitary inspection does not exist.

By the tenth section of the Public Health (London) Act, 1891, the Legislature has gone very near to giving such power as we have indicated to the local Sanitary Authority, for it is here enacted that the Sanitary Authority shall have a right to enter from time to time any premises, (a) for the purpose of examining as to the existence of any nuisance (b), where a nuisance has been ascertained to exist, or a nuisance order has been made. We are interested for the moment with the first of these sub-divisions of this section. If read by itself it would, we think, be said to give the Sanitary Authority power simply to enter any premises merely to ascertain what their sanitary state is. When, however, we turn to the end of the Act—to Section 115—we find this general power is modified. For Sub-Section 3 runs thus:—"If a Justice is satisfied by information on oath (a) that there is reasonable ground for such entry, and that there has been a refusal to admit to such premises . . . (b) if there is reasonable cause to believe that there is on the said premises some contravention of the Act," then the magistrate may authorise the Sanitary Authority or its agent to enter by force, if necessary. It is clear, therefore, that the owner of premises may refuse to allow a sanitary inspection, and that the Sanitary Authority cannot obtain a compulsory order unless there is "reasonable ground" for such an entry.

Very recently an application was made to a London magistrate for such an order by the Vestry of St. Pancras. The building which it was desired to inspect was the North London Collegiate School for Girls, Sandall-road, St. Pancras, which was not under the control of any public authority, local or central. The Governors of the school refused to allow such inspection and it was not contended by the Vestry that the premises were in an insanitary state. Their ground was that as twenty-five out of thirty-eight Voluntary schools in their district had been found to be in an insanitary state there was "reasonable ground" for suspecting the sanitary state of the North London Collegiate School—and, we presume, of others not yet visited by the inspector.

It is perfectly obvious that no magistrate, whether a lawyer or a layman, could hold this to be a "reasonable ground." It would be as reasonable to assume that, because two out of four public-houses in a street were badly conducted, the other two were managed in the same way. And, of course, the summons was dismissed.

Each side acted in a perfectly *bona-fide*



manner, and the legal point was at any rate settled by the magistrate's decision. But the serious question which this case and the present state of legislation raises is whether or not it would be desirable that there should be a compulsory sanitary inspection of places of education which are purely private establishments.

It is well known that all primary schools supported to any extent by the Government are subject to inspection. We have more than once pointed out that the present state of this inspection is far from satisfactory. It is done by the inspectors who examine the scholars in their studies. We repeat that the inspection of all primary schools, in regard to sanitation, light, and the condition of the building, should be done by experts, who should make a detailed report as to the state of each school. At the present time, if the sanitary state is not satisfactory, as often as not the inspector merely gives some verbal directions to the managers. There is no really efficient and thorough system of inspection; no record of any degree of minuteness is kept of the sanitary condition of schools.

We are bound to say that such sanitary inspection should be carried further. At present the ground upon which it is based is that a school receives some public money which gives the State a right to look into its condition. But the time has arrived when every school, whether it be for boys or girls, whether it be large or small, should be inspected at stated intervals by authorised inspectors. There is no reason to doubt that the North London Collegiate School is in a satisfactory sanitary state, and if it is how is it hurt by a sanitary inspector going over it and giving a satisfactory certificate? On the other hand, unless there is such compulsory inspection, there is nothing whatever to prevent a building used as a school being in some cases in an improper sanitary state. With the very best intentions those in authority at schools may not be up to the mark in sanitary matters; or, on the other hand, they may trust to a system of sanitation which, efficient enough in the beginning, has got out of order. Periodical tests are necessary, and these are not usual in regard to many buildings. There is no hardship on individuals. If persons lay themselves out to supply education, they have a duty to supply proper buildings. There is no more reason why a supplier of education should not have his plant inspected than the supplier of goods from a factory.

Many of the large public schools would certainly be the better for periodical visits from competent experts. The lighting arrangements are far from satisfactory in some schools, and there is such a demand for places that practically there is no competition as regards plant so long as it passes a kind of general muster.

The question would next arise as to what body should be the Sanitary Authority over schools, and we feel no doubt that this should be the Local Government Board. The larger the area over which sanitary inspectors make visits the greater is their experience and the more independent they will be. Hence we hold that the time has come when a compulsory inspection of all schools by competent persons should take place. It may be that some kind of half measure might be applied in regard to

the large public schools, and even to others in the first instance, such as the sending of certificates by a recognised authority to the Local Government Board which should be held to be tantamount to an official inspection. We live in a country of compromises, and these half-and-half measures have often to be adopted as a beginning. But of this we are quite sure, that the health of scholars should not depend on the will of the authorities of a school only, and that there should be either compulsory inspection or something which will have the same result.

#### NATIONAL COMPETITIONS OF SCHOOLS OF ART.

**T**HE exhibition of students' work in the schools of art throughout the kingdom now opened at South Kensington is in many respects as interesting as in former years. In the division of architectural design, although not presenting any work of such real merit as last year, there are some designs which are of value. The design for a farmhouse by Albert Herbert is sufficiently simple to express its purpose, although drawn in a somewhat exaggerated attempt after originality. The town house of Mr. W. Haywood, freely drawn in pencil and colour, although simple and free from pretentiousness, is perhaps the best piece of work shown. The plan is of interest, the billiard-room being in the extreme rear with top light, the roof being formed as a flower garden. In a corner of the drawing are photographs of a plaster model of the elevations—a good idea, which might be resorted to more frequently in students' work.

The country residence of Mr. Cale is as bad as the preceding design is good, and is an example of the "put-in-all-you-know" kind of architecture, destructive of all repose in design. It is, however, awarded a silver medal. Other designs are by Mr. Guthrie, of Glasgow, for a town house, the Scotch Baronial turrets being rather overdone. Three labourers' cottages by Mr. A. D. Thacker give a very pleasing and simple idea of the subject. The country house of Mr. Goodall has no north point. How a prize can be given to a plan without such a necessary adjunct is, perhaps, only known to a South Kensington examiner. The village club by Mr. H. P. Smith and the town house by Mr. T. Houston are good, but the "municipal buildings" and "market halls" of two other competitors are too ambitious and fussy.

The "local personal examinations" in architectural design are on somewhat the same lines as the examination in design of the Royal Institute of British Architects. It consists of three days of five and a half hours each. On the first day the subject is sketched out, and this must be fully worked out, without departing from the original idea, in the two following days. This year the subject given was a billiard-room and accessories; and although seventy-nine students were examined, there is scarcely one design which is worth perusal.

The papers answered on architectural history, principals of ornament, and historic ornament show certain facility in sketching architectural features.

Under the important and somewhat inclusive subject of "design," are some really interesting exhibits, including designs for table cloths, wall papers, brooches, glove

cases, butter knives, jugs, bowls, &c. In these, as in previous years, we note an absence of practical knowledge—a separation of the designing room from the workshop—which makes all the work under the South Kensington system so comparatively useless. Many of the designs have even no mention of what material they are to be worked in! Under the heading of modelling design are some good studies of panels and architectural features. Modelling and painting from the human figure are also shown in a small room.

The "architectural drawings from measurements" are mostly executed in a style, peculiar to South Kensington, which savours of the practice amongst architectural students in the early forties; most of the drawings are elaborately shaded according to sciographical rules, but such paltry details as the jointing of the stones are, in most cases, entirely omitted. What is the good, for instance, of the elaborate drawing of a bay of the nave of Winchester Cathedral without the stone jointing? Yet such a drawing is not only sent in, but is awarded the prize. Until the authorities put practical architects in charge of the architectural departments of the schools of art we can, perhaps, expect nothing better. On the other hand, the drawings are, in many cases, very carefully executed, and include such interesting buildings as Aston Hall, the Temple of the Sun, at Kew; Town Hall, Peterborough; Somerset House entrance, and the chantry of St. Mary at Warwick.

#### NOTES.

A Minister of Education and Art.

THE most important suggestion in the Report of the Museums Committee is the first of their special recommendations, viz.: that with a view to the efficient and economical management of the museums of London, "to say nothing of other educational advantages not within the order of reference," the Committee deem it of paramount importance that there should be an Education Minister of Cabinet rank having a seat in the Legislature, aided by a Parliamentary Secretary. Alter it to a "Minister of Education and Fine Arts," the title of the Department existing in the French Government, and this is what we have for years been recommending; not so much in view of "efficient and economical management" (though that is no doubt an important object), as in view of that official care for artistic interests and artistic development which is perhaps implied in the Committee's words as to "educational advantages not within the order of reference." Only we have always urged that such a Minister should be appointed permanently, and not be liable to removal with every change of Government. Art has nothing whatever to do with politics, and the result of making a Minister of Education and Art removable with every change of Government would be that art would still be regarded as subservient to political interests, and that a man who was carrying on admirable work in connexion with the promotion of art might be succeeded by some one who did not understand his views, and would proceed to undo all the good he had been doing. If the Report of the Museums Committee should lead to the institution of a Ministry of Education and Fine Art, it will have inaugurated a most important improvement.



But the object should be to find the best man for such a post, independent of any party considerations; and, when found, to keep him permanently in his place, and let him have a chance of carrying out his programme.

The Society for the Preservation of the Monuments of Ancient Egypt has issued to its members a circular describing the measures which have been taken, under the superintendence of Mr. Somers Clarke, for the preservation of the remains of the Temple of Deir-el-Bahari. The object has been to protect the most valuable of the sculptures by placing a roof over them to shield them from the glare of the sun upon the painted surfaces, and the disintegration caused by the alternations of heat and cold. The walls have been raised to a level around the Northern Hall, over which a vault in brickwork has been built. The south end of the vault is left open, and the sculptures, with which the walls of the hall are covered, can be better seen with a high side light than heretofore when the hall stood open to the sky. At the northern half of the middle colonnade the leaning columns have been set vertical, new stones being inserted here and there, and the columns carried up to their original height, so that they are now ready to receive a roof. To carry this roof a number of rolled iron sleepers were obtained from the railway administration, and are now lying within the temple ready to be used as architraves to carry the roof from column to column. The walls forming the back of the colonnades are now carried up ready to receive the roofs. The columns of the south half of the middle colonnade have yet to be repaired, and carried up to the necessary height to receive a roof which will shelter the sculptures. Immediately south of this is the portico of the Hathor Speos. On the north wall of this are sculptures of peculiar delicacy of execution, and still retaining much colour; and at the entrance of the Altar Court some of the wall sculpture remains, retaining its original colour with extraordinary brilliancy. For all these, if funds permit, some protection should be built. The south half of the lower colonnade bears on its back wall sculptures of great interest. The Exploration Fund has set in their places all the stones that could be found, and has yet to raise the columns in plain stone as high as the adjoining wall tops, which also have, in part, to be built up, and then covered with a roof. No attempt at restoration or falsification has been made; preservation of what exists is the sole object kept in view. Part of the funds required for the work have been collected, but a further sum of 200*l.* will be required to complete the work above indicated. Subscriptions may be sent to the Hon Treasurer, Mr. F. G. Hilton Price, 17, Collingham-gardens, S.W. It is to be hoped that the money required will be subscribed, as the work is such as must commend itself to the approval of all who are interested in the ancient monuments of Egypt.

St. Clement Danes Church, Strand. This church is now reopened, after having undergone extensive repair and redecoration under the direction and superintendence of Messrs. Henry and Percival Currey. Some of the stone louvres in the belfry, being

much worn, have been replaced in oak; all the pews have been lowered and, together with the rest of the woodwork, cleaned and polished. In the apse the two lower windows have been opened out, and the stained glass (three figure-subjects by Collins, 1844) from the central window above the altar is removed into three upper windows on the church's north side. The five windows in the apse are now filled with fresh stained glass, designed and executed by Messrs. Burlison & Grylls. The aisle-groining, in plaster, and the arched ceiling and spandrels of the vaulting, which are extensively decorated with panelling, festoons, and other enrichments, have been cleaned and coloured by Mr. H. G. Liley. The two wooden gates, now inserted outside the west doors, were designed by the late G. E. Street for another church. Being fashioned in the Gothic style, they are out of keeping with the general character of the fabric. The removal of the trefoil cusping from their upper railing would reduce the incongruity. The former church, the tower excepted, was pulled down in 1680. The existing one was built at a cost of 8,787*l.*, and opened in 1688. Wren's designs were carried out by Edward Pearce and John Shorthose, masons, whose agreement, dated May 13, 1680, with the churchwardens, and receipts for 3,071*l.* 1*s.* 9*d.* endorsed, is preserved in the British Museum. Wren modified and recased the tower, his work there including all up to the stage next above the clock dials—see Kip's view of 1715. A later view, 1725, by Kip shows the belfry-stage and spire designed, 1719, by Gibbs, whose "Book of Architecture," 1728, contains a plate of his elevation from the west, with a plan of his additions to the tower. On the widening of the two thoroughfares around the church in 1813-4, by Alderman Pickett, the south portico with six Ionic columns (similar to that of St. Mary-le-Strand) was removed; the nave's contracted east end and the rounded apse are probably due to the narrowness of the former roadway and a block of houses which stood at that end of the church.

The recent discussion of the subject by the Congress of Archaeological Societies, the action of the Irish Members of Parliament in their endeavours to annul an illegal sale of Irish treasure-trove to the National Museum of England, and other events have called attention to this important and difficult question; and the paper, signed Paul Clemen, on the "Preservation of Monuments in France," the first part of which appears in the latest number of the *Zeitschrift für Bauwesen*, will therefore be accepted as timely in this country. The author gives a history of the movement which culminated in the Act of 1887, and an account of the way in which its provisions are administered. Although France is almost as bad as Ireland in the destruction of historical monuments by injudicious restoration, still her provisions for preservation are theoretically the best, and the paper is well worth the careful study of those interested in the subject. The author has evidently made himself thoroughly familiar with the extensive literature which has been written upon the question in the principal countries of Europe.

THE New York *Electrical Engineer* of July 7 contains an interesting illustrated article describing a "Reno Inclined Elevator" which has been recently erected in a large store in New York. It consists of a movable plane, which is inclined at an angle of 25 deg. to the horizontal, and moves at a speed of 75 ft. per minute by means of an endless chain. The chain is turned by a sprocket wheel actuated by an electric motor, and the plane on it consists of bars of hard wood on which are placed parallel to the chain rubber-covered ridges 1 in. high and  $\frac{3}{4}$  in. wide. A handrail which moves at the same rate as the plane is an essential part of the system. The feet of the passengers rest upon the ridges, and are slid off at the top on to a comb-shaped landing, the prongs of which pass between the rubber ridges. It is stated that the landing is a most agreeable and natural one, and that there is absolutely no danger of feet or clothing catching at the top. Even cotton waste placed on it is carried safely to the top and does not catch in the prongs. The machinery works noiselessly, and can be started or stopped at either end by simply pressing a button. The moving plane is very popular with customers at the store, and has already carried over fifty thousand. It seems to us that there are several points in favour of this system. If the framework were built of steel and placed against a wall it would take up very little space and involve little structural alteration. Again, no attendant is required, and from the data given it appears that two thousand people can be carried per hour between the first and second floors at a cost of about 6*d.* for electric current. It is, therefore, much more economical than an electric lift.

On Wednesday, the 27th ult., "Scagliol" some interesting experiments showing the value of "scagliol" as a fireproof material, were carried out at Northfleet, near Gravesend, in the works and under the auspices of the London Portland Cement Company, Limited. "Scagliol" is stated to be a mixture of plaster of Paris, slaked lime, and other ingredients, subjected to a complex chemical treatment, to which sand, coal-ash, or other suitable material is afterwards added. This sufficiently vague description refers to a material which is light grey in appearance, and for ordinary building purposes is made up into slabs. It has been used on the continent for the last five years or so, and is said to have given much satisfaction to architects. The principal things made with "scagliol" are wall-slabs, ceiling-slabs, ceilings and chimneys; for mortaring purposes the same material in the form of dry powder is mixed [with] lime-water and used liquid. The slabs measure 15 $\frac{1}{2}$  in. by 23 $\frac{1}{2}$  in., and are made in three thicknesses approximately 2 in., 3 in., and a little more than 4 in. respectively. In order to test the fire-resisting properties of the material, a small building was erected of it in the grounds at Northfleet alluded to. This building was divided into two parts by a partition wall. In one of the compartments wood saturated with petroleum was stacked up; in the test this was fired and the maximum temperature attained, as recorded by a pyrometer, was over 1,500 deg. Fahr. We were informed that in a previous experiment a temperature of 2,300 deg. Fahr. was



arrived at. Soon after firing, small hair-line cracks were formed in the outer walls of the building, but the outside surface of the walls was perfectly cool, even whilst the high temperature above-mentioned was being recorded. Devices were arranged to show the extent of the bulging of the outer walls which, however, was found to be hardly appreciable by the method adopted. The other compartment of the building was separated from the fire by a partition wall about 3 in. in thickness. To this was loosely nailed a piece of muslin, and a sheet of paper, whilst a thermometer let into the wall recorded the temperature—the object being to demonstrate that whilst one side of the 3 in. wall was subjected to a temperature of above 1,500 deg. Fahr. the other should be cool, and thus to show the fire-resisting properties of the scaglioli wall. In the end this thermometer indicated a maximum temperature of 120 deg. Fahr. only, but for the greater part of half an hour, whilst the fire was burning, only 80 deg.-90 deg. Fahr. were registered. As soon as water was played upon the fire the temperature indicated by this thermometer rose to 160 deg. Fahr. Altogether the experiments were highly successful, and the scaglioli slabs were practically unaffected by the conflagration. It would have been more satisfactory if the chemical composition of the material had been stated—not merely that the “bulk of it was gypsum”—for that, with other things, would have enabled us to judge of its weather-resisting properties also; an equally important matter. There can be no question that scaglioli is an excellent fire-resisting material.

WE have received from the Vestry of Westminster a well-compiled paper on the subject of the Workmen's Compensation Act, which will doubtless be useful to many persons in the parishes. As it touches on various legal and practical questions which have been already raised and discussed, it is unnecessary to say anything about it at length. It is, however, interesting to notice that, whilst for the last four years the Vestry has voluntarily paid compensation to its workmen to the amount of 34*l.* 11*s.* 2*d.*, it could not have been obliged under the Act to pay more than 7*l.* 11*s.* It is also important to note that the quotations from insurance companies show that a sum of 81*l.* 5*s.* per annum would have to be paid in premiums if the Vestry were to decide to cover its risks by insurance. It is clear from this that the Assistant Vestry Clerk, by whom this paper is compiled, has some justification for speaking of “the preposterous rates” quoted by the insurance companies, and that his suggestion of joint municipal action for the protection of municipal interests has much to recommend it.

A NUMBER of Members of Parliament have signed a memorial to Mr. Balfour, asking the Government to legislate next Session on the subject of Old Age Pensions. The reasons for such legislation are very amusing. One reason is that something should be done “in view of the inconclusive results of the Inquiry by the Committee on Old Age Pensions.” Usually it is urged that legislation should take place to carry out the recommendations of a Committee or a Commission. This is the first time we have heard of

legislation being asked for because an inquiry has produced no result. The truth is that this question of Old Age Pensions is full of the greatest possible difficulties, nor has the social work of the Government been of a nature to make us desire to see this subject taken up by a weak Cabinet. Where, for example, is the London Water Act which was to have been law long ago?

THE recent return in regard to the application of funds by Local Authorities to technical education shows that for 1895-6 a sum of more than 787,000*l.* was spent. It is impossible, however, from the return to know if there was a sufficient advantage obtained by this expenditure. We notice that the money was expended in a somewhat miscellaneous manner. Dressmaking, ambulance work, type-writing, sick nursing, French, music, and all sorts of subjects appear to be comprised under the head of technical education. In Lincolnshire, for example, we find domestic economy, music and singing, hedging, under draining, and thatching, follow each other in succession. The amount expended is distributed very frequently in small sums, ten pounds to this village, twenty pounds to that school room. A large sum under such circumstances necessarily goes in salaries, postages, and expenditure of that kind. There is also great absence of any general system. We are inclined to think that some kind of Government inquiry is desirable to see if the country is getting its money's worth.

FROM Dr. R. Bruce Low's report to the Local Government Board on an outbreak of enteric fever in the Urban District of Camborne, we find that in central Camborne all the well-known worst features of rural insanitation are met with. Excrement disposal is mainly by means of privies, with cesspits or middens attached. Some houses in the outlying portions of the district have no closets at all. Many of the privies are of rude construction, and some are built of wood. The pits and middens are sunk below the level of the ground; many of them receive surface water as well as the drip from the privy roof. The majority of them cause nuisance. In some fifty instances the privy contents have, in process of removal, to be carried through the house from the back-yard to the front street. Privies are, as a rule, emptied at the expense of the occupiers at irregular intervals; the contents are mixed with ashes and carted off by farmers. Scavenging of privies as at present practised is altogether unsatisfactory. House refuse is stored in middens or in ashpits, mostly uncovered, in which it is retained for long periods before any serious attempt is made at its removal. When farmers cannot be induced to cart it away, it is frequently thrown out in heaps in back lanes or on waste ground. As a result some lanes are almost blocked by accumulations of house refuse and rubbish of all sorts. The report on the surrounding parishes records much the same state of things. This neighbourhood seems to be a stronghold of disease.

Dr. S. W. WHEATON's report to the Local Government Board on outbreaks of diphtheria in the Claypole Rural District, recounts how,

at Marston, a large watercourse passes through the village, the sewage in which is almost stagnant, and which contained at the time of his visit a very large deposit of offensive filth; while at Church-street, Long Bennington, a watercourse containing slowly-moving sewage derived from the dwellings on each side of the road passes down the whole length of the street, and falls into the Witham at a point close to that at which many of the inhabitants fetch water from this river for drinking and cooking purposes. Pigsties, which are either undrained or drain into small catchpits formed of loose stones, are frequently situated close to dwellings, and are a cause of nuisance. Excrement disposal is effected by vault privies. The vaults of the privies are sunk below the ground level; they are not cemented internally, and are formed of loose stone or brick; consequently filth cannot fail to escape from them into the surrounding soil. Such vault privies are frequently placed *only a few yards distant from wells*, so that pollution of water in the wells by soakage from them can hardly fail to occur. The wells are from 15 ft. to 30 ft. in depth, are drystained with stone or brick, and are not protected by any impervious material.

IN painting, as the First Grand Prix had not been awarded last year, the Academy this year distributed two First Grands Prix. They have given the first to M. Gibert, and the second to M. Laparra. M. Emmanuel Benner has gained one of the Second Grands Prix, and the other has been awarded to M. Guétin. The young artists had to represent “the Pool of Bethesda, of which the water disturbed by the Angel of the Lord cured the sick who bathed therein.” The picture of M. Gibert, although well composed and remarkable in drawing, lacks the qualities of colour which characterise that of M. Laparra. The canvases of MM. Benner and Guétin are good pupils' work. In sculpture, of which the subject was “Cain after the Death of Abel receiving the Curse of the Almighty,” it seems to us that the majority of the competitors have scarcely grasped the possibilities of the subject. The first Grand Prix has been awarded to M. Alaphilippe. M. Jean Boucher has received the first of the Second Grands Prix; and the second has been awarded to M. Alphonse Terroir. The competition in architecture, although we cannot now give the result, seems to have been of particular interest. The programme especially has the merit of being quite modern and realistic. The competitors were required to design a “Palace for the Guests of France.” This subject may be supposed very naturally to fall in line with the intentions of the Government in view of the Exposition of 1900. We especially note for commendation amongst the designs submitted those of MM. Chiffot & Arfvidson.

#### KILPECK CHURCH.

THE interesting Norman church at Kilpeck, in Herefordshire, has just been reopened by the Bishop of Hereford after repair. The church was restored about 1860, when a bell turret was erected at the west end, copings were added to the gables, and new fittings and seats were placed in the interior. For some time the roof has been in a defective state, and the interior has suffered from damp, and the want of proper drainage. The repairs that have been carried out have included the stripping and relaying of the old stone tile





Kilpeck Church.  
Interior looking East.

roof, felt having been placed over the boarding of the nave and chancel; the renewal of the plastering in the interior; and the removal of the font from the centre of the chancel to a position at the west end of the nave near the south door. Gutters and down pipes have been added, connecting with a drain round the exterior of the church discharging into the Castle Moat. The repairs have been carried out by Messrs. Collins & Godfrey, builders, of Tewkesbury, under the superintendence of Mr. Roland W. Paul, architect, of London.

We give two illustrations of this interesting church—the south-east view of the exterior and the view of the interior looking east. The chief points of interest on the exterior are the elaborate south doorway, one of the richest in carving in England; the curious corbel table with a series of grotesque heads; and a highly ornamented west window. There are shallow pilasters at intervals round the exterior, and

with the exception of two windows and a doorway inserted in the fourteenth century, all the windows are Norman with wide inner splay.

The interior, as will be seen from the sketch, has an elaborate chancel arch with curious figures on the columns. The arch with the apse is plain, but retains traces of the rood beam. The apse retains its original vault, the ribs and rear arches of the windows being ornamented with chevrons. At the west end is a gallery of the seventeenth century, carried on square columns. The font, which is now under the gallery near the south porch, is a large one with a circular bowl, about 4 ft. in diameter, resting on four columns and a central drum. The step on which it stands is modern. The bowl is apparently of unpolished Purbeck. There is a curious stoup, now in the chancel, and one or two pieces of carved work were found during the repairs.

#### THE ROYAL ARCHÆOLOGICAL INSTITUTE AT LANCASTER.\*

ON Monday, July 25, an excursion was made up the valley of the Lune. The first stop was at Halton, where the church and the remains of at least two Saxon crosses were inspected. The chief of these stands in the churchyard; its base and lower portion, with the story of the forging of Sigurd's sword, &c., have long been known to archaeologists, but some fragments of the upper part and cross were found when the body of the church was rebuilt in 1878, and the shaft has been continued in plain stone to enable them to be fixed in their approximate positions. Parts of another cross of the same character, discovered at the same time, are set up in the fifteenth century tower of the church. The legends depicted on the crosses were lucidly explained by Mr. Nicholson in the unavoidable absence of the Rev. W. S. Calverley. Close to Halton church is an imposing earthwork, probably a Saxon burh or moot-hill.

The next place visited was Melling, where the church, an interesting building of the fifteenth century, was described by the vicar, the Rev. W. B. Grenside. It consists of a chancel, and nave with aisles of four bays, and western tower. Owing to the slope on which the church is built, there is a considerable ascent from the nave into the chancel. There are some good pews of the date 1763 in the aisles, and in the vestry are preserved part of the old rood-screen, of fine design, some fragments of Saxon and other sculptures, and a large wooden roundel of late fifteenth-century work, boldly carved with the Agnus Dei. This is said to have come from the Temple Church in London, and has been placed here by Mr. Grenside. To the east of the church is another of the conical and flat-topped mounds, of which several examples occur in the Lune Valley. This one is unusually perfect, but, like the Halton mound, it lacks the loop-shaped enclosures usually associated with a burh, and may be merely a moot-hill.

From Melling the journey was continued to Hornby. After luncheon a visit was paid to the church, the architectural history of which was described by the Rev. Dr. Cox. The tower, which is octagonal, after the fashion of that at Coxwold, in Yorkshire, bears the inscription, "E. Stanley miles dms. i. monteagle me fieri fecit" and Lord Monteagle's arms within the Garter, to which Order he was elected in 1514, and died in 1523. The nave and aisles were rebuilt in 1888, but the chancel, with its unusual apsidal termination, belongs to a period slightly later than the tower. The church possesses an unusually fine late seventeenth-century altar frontal of Italian workmanship, a recent gift. In the churchyard is the lofty pyramidal socket of a Saxon cross (now lost) of early date.

A move was next made to Hornby Castle, where the party was hospitably received by Colonel W. H. Foster, M.P. The only ancient portion of the castle is the keep, a lofty tower, which, as pointed out by Mr. Roper in his interesting descriptive remarks, was built after the battle of Flodden by Sir Edward Stanley, Lord Monteagle, whose badge, an eagle's claw, and motto are carved on the wall. Mr. Roper traced the history of the castle through the Civil War, and referred to the remarkable series of law suits of which it was the object early in the present century, until its purchase by the grandfather of the present owner in 1859.

In the evening a meeting of the Historical Section was held, at which the Rev. Dr. Cox read some notes on the Shireburne family of Stoneyhurst, in view of the visit to Milton Church, next day. The concluding meeting followed, when votes of thanks were passed to the Mayor of Lancaster, the local committee, and others, through whose efforts the visit of the Institute to Lancaster had been so successfully carried out.

On Tuesday, the final stage of the proceedings was devoted to an expedition by special train to Whalley. On arrival there, brakes were in readiness to convey the party, which still numbered about a hundred, to Milton Church, where the architectural features and monuments were described by Dr. Cox. Owing to the quick fall of the ground eastwards there is a descent of three steps into the nave and of several others into the chancel, thus reversing the arrangement at Melling.

\* Continued from page 97.



The church consists of a fifteenth-century tower, an aisleless nave of the thirteenth century with good Perpendicular open roof, and a chancel of Decorated date (circa 1328), with an interesting north chapel of Elizabethan "Gothic" built in 1594. The building at first sight is rich in old fittings, but closer inspection reveals the fact that, including a good deal of the roof-screens, these are cast-iron imitations put in in 1838. The font cover is an interesting pyramidal example of the date 1593. The chancel has a good example of a low-side window, which Dr. Cox pointed out was neither for confessional purposes nor the use of lepers—both utterly impossible theories—but probably for ringing the sacring bell at towards the manor house or village. The north chapel, in addition to its architecture, is remarkable for a fine parclose of the same date, and a singular series of effigies of the Shireburne family. Dr. Cox pointed out that in three cases of persons who had died only about two centuries ago, the effigies were shown cross-legged, which was only another proof that such an attitude was in no way indicative of a Templar or one who had been in the Crusades.

After inspecting the curious rude fourteenth-century cross (on an ugly modern shaft), and other relics in the churchyard, the party returned to Whalley.

After luncheon a visit was first paid to the parish church, where Mr. Micklethwaite called attention to the remarkable series of pews with which the nave and its aisles are filled. These include the fifteenth-century enclosures, or "cages," of the chantry chapels at the ends of the aisles; a large and equally elaborate "cage" built about 1534 by Roger Nowell; and a good many excellent pews of early-seventeenth century date. Among these is the "constable's pew," placed close to the door to enable that officer to take note of the presence or absence of "Recusants." It has most needlessly been lately moved from its original position. The nave and its aisles are of the fifteenth century, with an open roof like that at Milton, and a western tower. The chancel is of the thirteenth century, and contains a fine series of fifteenth-century stalls, with misericordes and lofty canopies. These, Mr. Micklethwaite thought, from their non-parochial character, had probably been removed hither from the neighbouring abbey at the Suppression. In the churchyard are three early Saxon crosses.

A move was next made to the abbey, which was described by Mr. W. H. St. John Hope. The monastery, which was of the Cistercian Order, was first established at Stanlaw, in Cheshire, in 1178, but removed to Whalley, as being a more convenient site, in 1206, when the abbey contained thirty-six monks. Mr. Hope suggested that the first buildings, like the original *monasterium lignum* of Cîteaux, were of a temporary character, for although the abbey and precinct were dedicated in 1306, the church was not begun until 1308, and the high altar was not hallowed until four years later. A "new church" was also begun in 1330, but the work of it went on so slowly that mass was not sung in it until 1380. In 1362 the Provincial of the Order remitted the contribution of the abbey to the General Chapter until the church should be finished, and the dorter and frater built. The chapter-house was already built before 1418, and in 1425 the new dorter was entered. New stalls in the choir were first used in 1435, a date which Mr. Hope pointed out would agree well with that of the stalls now in the parish church. A Lady Chapel was built by the ill-fated Abbot Paslew between 1507 and 1521, but its site was unknown.

The great gatehouse, a fine and perfect example of the fourteenth century, was first visited. Its upper story was a chapel, now inaccessible without ladders. This, Mr. Hope thought, might represent the *capella extra portas* usual in Cistercian abbeys, as at Furness, Fountains, and Rievaulx. A move was then made to the site of the abbey buildings. The great church has been utterly destroyed, but a fragment of its west end remains, and the lower part of the south transept gable, both of late fourteenth-century work. Passing to the site of the cloister, now partly farmyard and partly garden, Mr. Hope referred to the interesting departure from the normal plan, which was otherwise followed here, of several of the buildings, notably of the frater, which, though now destroyed all but its door, must have stood east and west, as at Sibton and later at Cleeve, instead of north and south, like that at Fountains. The *cellarium* or western range also

differed materially from the usual Cistercian type, as seen at Furness, Fountains, and Rievaulx, and more closely resembled the "cellarer's lodging" of other Orders. This, Mr. Hope thought, was due to the disappearance of the *conversi* or working brothers, of whom hardly any traces could be found in English abbeys after the Black Death in 1349. The Whalley *cellarium* consists of a two-storied fourteenth-century building, fortunately nearly perfect, now used as a barn, &c. Of the other buildings nothing was left but the range east of the cloister, which contained the vestry, chapter-house vestibule, parlour, and other offices, with the very perfect remains of the reredorter at its southern end. The chapter-house, which must have been attached to the east side of the range, has disappeared. From these buildings a covered passage or gallery, probably with the library above, led to the infirmary and abbot's house, a good deal of which remains, overlaid by later work in the existing mansion, access to which was most kindly permitted by Mrs. Tyas, the present occupant.

Leaving the abbey precinct by a second gatehouse, of the fifteenth century, and still perfect, the party made their way to Whalley Station, where the special train was in waiting to convey them to Lancaster, and so the meeting, which was in every way a most successful one, in numbers, as to weather, and the interest of the places visited, came to an end.

### COMPETITIONS.

CHURCH, SPARKBROOK, BIRMINGHAM.—At a recent meeting of the Buildings and Sites Committee it was announced that the following competing architects had sent in plans for the new Church of St. Agatha, to be built in the Stratford-road, Birmingham, viz.:—Messrs. Bateman & Bateman, W. H. Bidlake, R. Creed, William Henman, H. E. Lavender, M. Macartney, Edward Mansell, Temple L. Moore, F. B. Osborn, and T. F. Proud. The plans have been examined by the assessor, Sir Arthur Blomfield, A.R.A., whose report and recommendations will be considered at a meeting of the trustees, to be held early this month, at which the appointment of the selected architect will be made.

LUNATIC ASYLUM, WEST BANGOUR.—Mr. Hippolyte J. Blanc, R.S.A., has been appointed architect for the new asylum at West Bangour. In our next issue we shall give some particulars of the proposed building.

### ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual excursion of the members of the Northern Architectural Association was held at York on the 23rd ult. The members, on their arrival at York Station, were met by Mr. Benson, the President of the York Society; Mr. Burleigh, the secretary; and others. The members proceeded to the Station Hotel, to inspect some work at present being carried out in the hotel by Messrs. Robson for the North-Eastern Railway Company, in fitting up the new reading-room, waiting-room, &c. They afterwards visited the following buildings under the guidance of Mr. George Benson.—The Church of All Saints', North-street, where some fine old glass was seen; the ruins of St. Mary's Abbey and the Museum; the King's Manor House; King William's College; the Guild Hall; the Merchants' Hall; the Shambles; the City Walls, and many objects of interest in passing. It was decided that as members were fairly acquainted with the Minster it should not be visited, there being so many other lesser-known buildings to inspect. The members afterwards dined together at the Station Hotel.

THE CLERGY AND ARTISTS' ASSOCIATION.—The Clergy and Artists' Association will hold its Third Church Congress Exhibition in the Bradford Art Gallery, during Congress week, by permission of the Committee of the Art Gallery, who have placed a portion of the Gallery at their disposal. As before, a special feature of the exhibition will be examples of work executed under the auspices of the Association. It is hoped also to include examples of Sir W. B. Richmond, of Mr. G. F. Watts, and Mr. Holman Hunt, and other representative examples of individual artists and craftsmen working in churches. The exhibition will be free. Artists desiring to submit examples of their work may do so by communicating with the Secretary, 6, Millbank-street, Westminster.

### TARRED MACADAM IN THE CONSTRUCTION OF ROADWAYS IN URBAN DISTRICTS.\*

THE committee of the last International Congress of Hygiene and Demography, held at Buda-Pesth, adopted the following resolution:—"That the paving of streets should be smooth, and as far as practicable impervious to facilitate cleansing, and also to prevent contamination of the subsoil." The text of the resolution comprehends in a sentence all the essentials of a good roadway. These may be briefly summarised under the following heads—

- (a) Durability;
- (b) The minimum of noise; and
- (c) The minimum of first cost (consistent with the foregoing).

The attainment of the first of these, viz., Durability, is best realised by the adoption of granite sets, as may be witnessed more or less in all large cities, and nowhere to a greater proportionate extent than in the city where the Association is now assembled. This kind of paving, however, is not smooth; it is most noisy, the truism of "empty vehicles (not vessels) making the most sound," receiving abundant illustration on this form of road; further, unless laid on a bed of concrete and jointed in pitch, it is not impervious, and the facility of cleansing is much impeded, due to the numerous joints wearing open and rounding off, holding the dirt and dust of roadways. It is, moreover, costly, probably nearly as costly in construction as wood pavement, and its only claim for use is its durability. Allied to this material for road formation is the use of blue brick sets for carriageways, which are having experimental trials in a few places.

The attainment of the second head—i.e., minimum of noise, is best realised by one or other of these descriptions of materials:—1. *cutta-percha*. 2. Compressed asphalt; and concrete macadam. 3. Wood paving. 4. Macadam.

The first named is mentioned only as the ideal of noiselessness, and not as entering into comparison with any of the well-known materials of road construction. It is in a very experimental stage as yet, and has hardly come within the scope of practical consideration. It is to be seen in small short sections in Glasgow, and at the entrance to Euston Station, London.

Compressed asphalt, also concrete macadam, is clean, impervious, durable, and, saving for the clatter of horses' feet, may be described as comparatively noiseless. Involving, as asphalt does, the underlying bed of concrete, the first cost renders it prohibitory in all save large centres of population. It is moreover slippery and unsuited to inclined roads upon a hill.

Wood paving comes next in the fulfilment of the necessary conditions of the text. It is smooth; it is probably the least noisy of any of the descriptions of hard pavement; it is of moderate durability; and, if of the hard wood description, practically impervious to moisture. Its first cost, however, and the unreasonably short periods allowed for repayment, render the general adoption of wood pavement in moderately-sized towns, or even in the suburban parts of large cities, very unlikely if not prohibitory. The class of town or urban district to which allusion is made, is that of moderate size and limited financial resources, which are restricted therefore to the use of "macadam" in the constructions of their highways.

As it is from moderately-sized towns or districts that so many members of this Association come, the consideration of any improved form of macadam paving acquires special interest and importance; and there is no improved form of macadam which is so coming to the front, and demanding that attention which its merits unquestionably deserve, as that now going by the name of "tarred macadam." That is, a composition of any of the stones, gravel, or clinkers commonly used in the making of macadam roads with a mixture of tar. It appears a simple enough composition, but its preparation and laying, so as to turn out a success, bristle with delicate detail.

When properly made and on roads suited for it, this construction of road complies most nearly—compressed asphalt perhaps excepted—with the conditions laid down in the resolution set forth at the outset of this paper. It is

\* From a Paper read by Mr. A. H. Campbell, City Surveyor, Canterbury, at the Annual Meeting of the Incorporated Association of Municipal and County Engineers, held at Edinburgh recently.



a smooth and noiseless road, it is non-absorbent, it is cleanly in itself and easily kept clean, and its first cost is within the capacity of the most restricted finance of small towns and districts. With all the advantages enumerated, it appears remarkable that tarred macadam has not yet been adopted except on the most limited scale. It is true that tarred gravel or limestone footpaths have been in use for a great number of years, and have now obtained a deservedly wide adoption, but the extension of this same composition, only of a larger gauge metal, to the construction of roadways has been most limited. As accounting for this, these reasons may be suggested, viz.:—the failures which frequently attend a first trial; an uncertainty as to the properties and action of tar, and how it will unite with the aggregate which it is designed to incorporate. The author can speak from personal experience of its failure and of its success too: failure where success was expected, and success where failure might be anticipated; and this is evidence of the fickle character of the composition. To its preparation, storage, and laying the author has had special opportunity of study, the composition, as used by him, being prepared by the workmen in his department.

In tabular form there is here submitted an epitome of particulars of several streets laid by the author during the past three years.

opened up, and the hot stone applied to the prepared tar. In either of these methods of firing the stone, a great deal of loss by disintegration occurs, the stone succumbing to the influence of fire, and tending to get reduced to a coarse-grained powder. Particularly so was this the case with a trial of granite exposed to fire, which quickly produced the condition above described. For this reason the author would much prefer the heating of the stone in an oven or kiln; the temperature would be more equable, and the severe firing causing the disintegration described would be avoided. On the subject of "heating" one or two remarks may be submitted. The author believes it to be the practice with some makers not to heat the stone at all, but being sure that the stone is dry and free from moisture, apply it in the cold but thoroughly dry state to the prepared tar. This condition of the stone, in the author's opinion, resembles the risk attached to laying the tarred mixture in position in cold instead of hot weather. The tar refuses to "work," the temperatures are so unequal, and when the sun (particularly the sun of the sunny south) beats upon such a road it is not improbable but that this defect will discover itself in the liquefied tar bubbling and spewing itself up over the surface.

The temperature of the stone when the tar is applied should be such as the palm of the

required camber of the road. The author's reasons for this underlying ballasting of dry material are twofold: (1) To separate the tarred composition from any damp substratum, and (2) to economise in the thickness of tarred material. Under the author's practice, the tarred composition is only 4 in. thick (finished). This by itself would be an insufficient surface formation to bear the traffic and resist the damp, but underlain by the dry ballasting of hard material, well rolled and preferably grouted with cement or brushed with well-boiled tar, appears to answer the requirements for which it is introduced. One sentence is necessary as to having the tarred mixture all in a fresh or "live" state when being laid, otherwise cracking and disintegration of the road will rapidly occur; also in keeping off all traffic during the progress of the work, not because the traffic in itself is an injury, but because of the dirt, dust, and other matter foreign to the mixture being imported, and destroying the binding together of the layers in one corporate mass. This hint is one to which the author attaches considerable importance, as the effects of this occurrence have been painfully present to his sight upon portions of two roads which he has laid down.

The quality of the tar employed is no less important than the other details of the work. Some trading firms making this material use the refined or distilled tar, and excellent results are thus obtainable; but more commonly it is the ordinary gas tar that is used at a cost of about 2d. per gallon. This tar should be as far as possible free from water, of a stiff dense consistency, any defects of this character having to be counteracted in the boiling operation; the lighter the tar the longer it must boil, so that all light oils are driven off. To each fifty gallons of tar is added a small proportion of pitch (about half a bucketful), and these are boiled together. The author would not assert the necessity of introducing even this small proportion of pitch, but the cost is almost infinitesimal, and as a counteractive to bad quality of tar it is good and worth introducing.

The life of this description of road paving may be taken at seven years; so that, divided up over that term, the annual cost of a road so paved will work out at 77d. During this term it may become necessary to outlay certain small amounts in repairs so as to maintain the surface smooth, whole, and impervious; this, estimated at 2d. per yard per annum, will give a grand total of 97d. per super yard per annum for this description of roadway. This rate for a good street pavement in urban districts, for heavy vehicular traffic of the ordinary sort (that is, excluding traction engine traffic, for which it is unsuited), is most moderate. Compare it with any of the other descriptions of paving: even than ordinary macadam it is rather less; and side by side with any of the improved harder pavements—wood, compressed asphalt, or sets on concrete bed—it is incomparably less costly.

The author does not, however, suggest that this description of pavement should enter into competition with these superior materials of road construction; each and all of them—stone sets, wood, asphalt, tarred macadam, and ordinary macadam—have their respective places; all, save tar macadam, have had their field and play, and it is for a fair field, devoid of any favour, that the author presents to the Association a plea on behalf of tar macadam. On the leading streets of smaller provincial towns, in the secondary and suburban thoroughfares of large towns, where in many cases stone or granite sets are used, of heavy cost, tarred macadam, properly prepared and laid, would form a welcome, valuable, and economic substitute.

**IMPROVEMENTS AT THE GUILDHALL.**—The Corporation has decided to expend 2,500l. in carrying out certain alterations at the Basinghall-street entrance to the Guildhall. These have become necessary through the demolition of the offices of the Chamberlain and the Weights and Measures Department and the erection of the new Public Health Offices. A permanent entrance will be made from Basinghall-street, starting from the library and running northward to the new block of offices. This will form a public approach to the strangers' gallery of the Council-chamber and the eastern portion of the Guildhall and its committee-rooms. The entrance will be fitted with gate piers of wrought iron, and the footways and carriage-ways will be paved with asphalt. The opportunity will be taken to complete two buttresses and to add a new window to the Council-chamber, thus finishing the "façade." A connexion will also be made between the library and the Common Council-chamber for use on ceremonial occasions.—*Daily Chronicle*.

Name of Street.	Width of Carriageway	Nature of Traffic.	Date when Laid.	Thickness, Aggregate.	Cost per Superficial Yard.	Experience.
Stour-street .....	ft. in. 8 2	Heavy continuous traffic, 3 traction trains passing daily .....	July, 1895.	6 inches Kentish rag	About 4s. 6d.	Failure: quite unable to support the constant action of the traction engine traffic.
Turnagain-lane (cul-de-sac) .....	8 2	Light van traffic.	November, 1895.	4 inches of gravel on the old natural road formation.	3s.	Satisfactory.
Orange-street ..	17 0	Medium through traffic, carriers' wagons, carts, and tradesmen's vans .....	March, 1897.	4 inches of gravel underlain by 3 inches hard broken brick.	4s. 6d.	Most satisfactory.
King-street .....	(1) 16 6 (2) 8 2	Ditto .....	May, 1897.	3 inches ditto.	About 4s.	Moderately satisfactory; centre of way along horse track commenced to disintegrate, due to the tar being overboiled, and the material hardening or setting before using.
Guildhall-street ..	15 9	Heavy through traffic, omnibuses and general town traffic .....	September, 1897.	4 inches ditto.	4s. 6d.	Generally satisfactory; superficially softens on parts in sun heat, but otherwise is doing well.

Besides the foregoing list, a number of lanes in Canterbury have been partially laid with this composition: and at the present time St. Margaret-street, about 700 ft. long, with a carriageway of only 12 ft., and in the centre of the city, having heavy vehicular traffic, is in process of laying.

The preparation and laying embrace these details:—1. The nature of aggregate and its preparation. 2. The tar, its nature and treatment. 3. The mixing of these two together. 4. The storage. 5. The laying down upon the road. 6. The cost.

As regards the nature or description of the aggregate, the author has tried Kentish rag-stone, surface picked flints, pit gravel, and Guernsey granite. The stone is prepared for use by burning in the open. It is laid out first of all in a flat bed about 12 in. thick, and of rectangular plan; on this is spread a layer of coke and breeze about 3 to 4 in. thick, with a little wood to assist the fire; this is then overlaid so as to form a stack of stone of about 5 ft. in height from the ground. In the meantime, as the last addition to the height is made, the fire of wood and coke has been kindled, and it is allowed to penetrate the stack. About 1½ chaldrons (54 bushels) of coke are consumed in a stack of 60 cube yards. As regards the length and size of the stack of stone, this may be made endless by laying out the stack so as to describe a circle, thus following in the process of mixing a circular course, with certain obvious advantages. Other makers of tarred stone composition in the author's district arrange the stack in the form of a cone, close it up at the top, fire it in the centre, and, allowing the fire to penetrate the mass, leave the stack of stone untouched whilst this process of firing proceeds. This operation may take any time between seven and ten days; the stack is then

hand can bear with comfort; if too hot, the tar will be destroyed as a cohesive; if too cold the tar will go on too thickly, and under the rays of a hot sun will soften. The hot stone when ready to be mixed with the prepared tar, is sifted through two gauges, graduated to 1 and to ½ in., giving three sizes of material, viz.: 1-in. to 2-in. gauge for the body material, ½ in. to 1-in. gauge for the intermediate or fining coat, and ½ in. to ¾ in. gauge for the skin or top dressing. These three sizes are laid in layers as follows, viz.: 3 in. to 4 in. thick of the coarse, about ¾ in. thick of the intermediate, and the top dressing in the thinnest layer possible, with a view only to filling all interstices; thereafter a dressing of fine ¾ in. granite or limestone siftings is scattered broadcast, and the traffic at once allowed on the road, working this top dressing in and assisting in the consolidation of the road formation. The weight of the roller employed by the author is nominally ten tons, and each of the three layers is rolled separately.

Considerable importance is attached to the state of the weather at the time of laying: in the sun by preference and to assure a good result; if laid in a cold temperature and with any defects present in the composition, disappointment and possible failure will result. Weather being normal, any time between May and September (inclusive) may be regarded as suitable. One word as to wet weather. Operations both of mixing and of laying should be suspended in time of "wet," where conducted in the open, as nothing so corrupts the composition as the presence of moisture.

In constructing a road of this tarred composition, the old surface is removed to a depth of 8 in., and re-made with a 4-in. thickness of dry hard broken stone, furnace clinker or brick; this is rolled smooth and finished to the





Doorways in Queen-square, Bloomsbury.

## DOORWAYS, QUEEN SQUARE, LONDON.

THIS sketch of two doorways in Queen-square, Bloomsbury, is by Mr. H. F. Waring, and formed part of the collection of drawings which gained for him the Architectural Association Travelling Studentship, the more important ones of which we have already illustrated.\*

A characteristic point in the design is that while each doorway up to the horizontal cornice is a separate and complete design, the pediment combines them into one design.

## ARCHÆOLOGICAL SOCIETIES.

ESSEX ARCHÆOLOGICAL SOCIETY.—The Essex Archæological Society recently made an excursion to Brightlingsea and other places. After an inspection of Brightlingsea Church, the Rev. A. Pertwee contributed a brief description of the building and its history, stating at the outset that since Morant's time the edifice had suffered considerably in style and character by the loss of its original roof, which fell in 1814. The building was a good example of the Essex Perpendicular church, and its tower had been pronounced one of the finest in the country, while the whole place had a peculiar effect of massiveness. The gentleman went on to draw attention to many points of interest, mentioning that some features of the Decorative and Early English periods still remained, but there were no traces of Norman work, with the exception, perhaps, of a singular horseshoe-shaped recess in the south aisle. The objects alluded to by the Rector having been duly examined, a move was made, via Alresford, to St. Osyth, where luncheon was partaken of at the Red Lion Hotel, immediately before a visit to the Priory. Some time was spent in an examination of the old chapel. Its most important features were dealt with by Mr. Biddell, of London. The next place visited was the parish church, the unusual dimensions of which, as compared with the size of the village, were explained by Mr. Biddell as being due to the fact that the

Augustinian monks were very great preachers; consequently, large concourses of people would frequently assemble in the building. Here, Mr. Biddell said, they saw the original plan of a church which was built in Norman times. About 1500, when the neighbouring priory grew richer, the completion of the building was commenced, but the work was cut short by the dissolution of the monasteries. The fine carved oak roof, probably the work of the monks, came in for a large amount of admiration, and subsequently a start was made for the last stopping-place, Great Clacton. The little parish church of Great Clacton received attention, and Mr. Beaumont read the substance of a paper written upon it, which had already appeared in the Society's transactions. He gave the date of the building as about 1150, and mentioned that the heavy groined roof of the original design proved too much for the constructive powers of the builders of those times, for the walls gave way, and the idea of the groined roof had to be abandoned in the restoration. A slab in the church commemorates the fact that Eleazar Knox, second son of John Knox, the Scotch Reformer, was some time vicar of the church. The late hour only permitted of a hasty examination of the edifice, and the last stage of the journey was commenced about five o'clock, Colchester being reached some two hours after.—*East Anglian Times*.

## ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—The following is the programme of the summer meeting of this Institution:—August 6 and 7, Buxton. Monday, the 8th—visit to the Lancashire and Yorkshire Railway Works, Horwich. Tuesday—visit to Messrs. Laird's Birkenhead Iron Works and the Sunlight Soap Works, Bramborough Pool; in the evening there will be a reception at the Walker Engineering Laboratories, University College, Liverpool, by Dr. H. S. Hele-Shaw. Wednesday—visit to the Lancashire Watch Company's Works, Prescott; in the evening the Institution Summer Dinner will be held at the Adelphi Hotel, Liverpool, the President, Mr.

John A. F. Aspinall, in the chair. Thursday—visit to the pumping stations of the Liverpool Waterworks, and the generating station, &c., of the Overhead Railway; luncheon at the Alexandra Hotel by invitation of the Liverpool Engineering Society; in the evening a visit will be made to the Paradise-street station of the Liverpool Electric Supply Works. Friday—a steamer excursion to Llandudno.

## METROPOLITAN ASYLUMS BOARD.

SIR EDWIN GALSWORTHY, Chairman, presided at the usual meeting of the Board at the County Hall, Spring-gardens, on Saturday.

Appointment.—Mr. W. T. Farthing, of No. 46, Strand, W.C., was appointed to measure up the additions and omissions in respect of the contract of Messrs. Slaters, Limited, for the extension of the Western Hospital.

Bills of Quantities.—Mr. J. T. Helby moved that the Works Committee be instructed to consider and report upon the advisability of the bills of quantities forming a part of the contract in all future contracts. He pointed out that there had been an extraordinary difference between the architects' estimate and the lowest tender for the new isolation pavilion at the Eastern Hospital. This was accounted for on inquiry by the fact that certain items had been taken out by the quantity surveyor which were not specified by Messrs. Harston, the architects. It was a serious matter that items not included in the specifications should be included in the bills of quantities, and probably the same thing had arisen in many other cases. The letter of Messrs. Harston showed that in the bills of quantities in this case had been included the cost of shoring up buildings which did not exist. A large quantity of excavation for roads was provided for, where there was nothing whatever in the drawings or specifications to warrant the assumption that it would be needed. It was clear the Board had been paying for many things they ought not to pay for, and the question was whether they ought to have a quantity surveyor of their own.—The resolution was seconded by Mr. F. Purchase, and carried.—Mr. Percy Wells moved, "That a return be laid on the table showing the total amount paid to quantity surveyors for the past ten years ended June 30, 1897." This was seconded by Mr. Cochran, and on the suggestion of Mr. Helby, the wording was altered so as to require the separation of the cost of taking out quantities from that of measuring up. After a short discussion the resolution was carried.

## Books.

London Riverside Churches. A. E. DANIELL. Westminster: Archibald Constable & Co.

THE author supplements his previous volume upon the London City Churches (noticed in our columns on January 18, 1896) with a work upon the churches situated on or near the banks of the Thames—those in the City excepted—between Kingston and Greenwich: an attractive subject, and treated in a very pleasant fashion. As Mr. Daniell does not deal with matters of architectural criticism, in the higher sense, and seems to have gathered his materials for the greater part from sources that are commonly accessible, his book scarcely calls for any elaborated review in the *Builder*. Of St. John's, Westminster, which stands conspicuous in the centre of an area to which public attention has lately been directed, he repeats the story that the four towers were added by necessity, to give stability to the fabric, and did not form part of the original design. But four towers do appear in the print lettered "Mr. Archer's design of St. John's Church, in Westminster, as it was resolved upon by the Commissioners [for the 'fifty churches']". The alterations made since this design were done without the consent or knowledge of Mr. Archer." In respect of the modified towers Archer's design shows them as square (they are now rounded) on plan, with another arrangement of columns and entablature, and, instead of the present bell-shaped leaden cupolas capped with cones, he has at their four angles turrets with pilasters, connected by a balustrade, and each of them terminated by an obelisk finial. We may add that thirteen years ago about 800*l.* were expended in alterations of the interior, with removal of the pews, under Mr. Butterfield's

\* See *Builder* for June 18 and 25 of this year.



superintendence, and that the font, cited by Mr. Daniell, was carved by J. Thomas after C. Barry's designs. Chelsea is associated with the memories of Sir Thomas More, Sir Hans Sloane, Sir John Fielding, Bishop Atterbury, Swift, Smollett, and many other celebrities. More's Latin epitaph, with its original reference to his being the terror of heretics, is well known; we are reminded thereby that a few weeks ago Cardinal Vaughan opened in Beaufort-street, which occupies the site of the Chancellor's "poor house in Chelsea," a church to be in charge of a French order of nuns who will offer unceasing prayer day and night for the conversion of England to the Roman Catholic faith. Since Mr. Daniell cites the gravestone in the (old) churchyard of Francis Thomas, *obit* January 6, 1770, "Director of the China Porcelain Manufactory, Lawrence-street, Chelsea," we may mention that the factory stood at the street's south-west corner, close to the church, and that in March, 1759, Nicholas Sprimont, of Chelsea, leased the site from Henry Porter, of Little Suffolk-street, St. Martin-in-the-Fields; on September 29, 1769, he re-leased the site and factory to James Cox, of Shoe-lane, who, on February 9, 1770, gave a lease of the premises to William Duesbery (then of Derby) and John Heath. Duesbery worked there until 1784 when, in terms of the covenants, he demolished the kilns and workshops; he died in November, 1786. In his account of Hawksmoor's church of St. Anne, Limehouse, the author omits to say that after the fire of 1850 the fabric was restored by Sir Arthur Blomfield and the late P. C. Hardwick, and the former, a few years ago, carried out the repair and decoration of the interior, and in 1878, re-arranged the interior of St. Mary Parish Church, Battersea, and restored St. Mary Parish Church, with the Bishop West Chapel, Putney. To Mr. Daniell's list of the most noteworthy churches near the river might be added Pearson's Holy Trinity, Vauxhall Bridge-road, and St. Peter's, Vauxhall, with Sir Arthur Blomfield's churches of St. George, Old Brentford, and St. Matthew, Wandsworth Bridge-road.

*Ely Cathedral Handbook.* Revised by Dean STUBBS. Ely: Tyndall. 1898.

We have little but commendation for this excellent handbook. It contains much interesting information, and is very full and complete. Some minor points may be noticed. The Dean does not seem to be aware that the return aisles of the transepts have been shifted back; originally they were as broad as the side aisles, as they still are at Winchester, the Abbaye-aux-Hommes, and St. George de Boscherville. The position of the Lady Chapel is described as unusual. It should be added that the Lady Chapel of Peterborough (c. 1272) and Bristol (c. 1220) are in precisely the same position; both were originally detached buildings. The reason for the northern position in all three instances is probably not ritualistic, but constructional. In a church with a low retro-choir or with an ambulatory, such as Winchester or Norwich, it is easy to build a Lady Chapel to the east; not so where the vault continues in unbroken height to the extreme east end, as at Peterborough and Ely. Bishop West's Lady Chapel is described as a rich specimen of Italian Renaissance. It is a thoroughly Gothic composition, except in the scroll-work and some minor detail. Nor has its vault fan-tracery; it is Bishop Alcock's Chapel which has fan-tracery. And whatever induced Alan of Walsingham to erect an octagon over the crossing, it was certainly not because he wanted "to build up something less likely to fall than the traditional central tower borne upon four open arches"—the reason quoted from Freeman. The "unhappy practice" of raising the aisle-walls and flattening the aisle-roofs was a very sensible one. By inserting large windows in the heightened walls the builders were able to make Ely nave what it is—one of the best-lighted naves in England. To the evidence of the eleventh century date of the eastern transept, it may be added that on that side only voluted capitals occur. An excellent feature in the book is the addition of a list of authorities, to which, however, should certainly have been added Mr. Beresford Pitt's paper in the bound volume of the *Builder* series of English cathedrals. Another good feature is a table of dimensions. The Dean also gives an index, three plans, and ten photographs. The Dean has taken a pride in his work, and has done it thoroughly.

*An Address Delivered by William Morris at the Distribution of Prizes to Students of the Birmingham Municipal School of Art.* February 21, 1894. London: Longmans; 1898.

This small book is "Printed at the Chiswick Press and finished on the 18th day of April, 1898," as we are informed in what appears to be the closing paragraph of the lecture, being printed in the same type and as part of the same page; the form and the precise information conveyed being merely a piece of archaism. The type imitates that in which some of the Kelmscott Press books were printed, which looks picturesque on the page, no doubt, but has the serious disadvantage of being very trying to the eyes. The lecture contains very much the same gospel of art, in very much the same words, which Morris preached on various other occasions, and with the same mixture of truth with exaggeration and Utopianism. The best paragraph in it is that on the beauty and interest of natural scenery, whether "grand" or not in the guide-book sense:—

"Our fault. . . . is that for the most part we refuse to pay attention to anything in nature which is not tremendous and exciting; it must be an Alpine pass or a rocky sea-shore, or at the least a piece of mountain in England and Wales; less than that will scarcely draw our eyes to beholding. . . . Yet I must tell you that if you can get no pleasure out of the sight of a Warwickshire meadow, or the hedgerows and little waving hills of my native Essex. . . . I doubt your capacity for really seeing the huge Swiss mountain and valley scenery."

He goes on to say that what people miss in landscape which makes them call it flat and uninteresting, is that which may be called "character," "which does not depend on either bigness, or roughness, or richness." It may be doubted whether the perception of character in landscape, here referred to, is ever to be acquired where it is not inborn; but the criticism is a perfectly true one.

*A Guide to the Guildhall of the City of London.* London: Simpkin, Marshall, & Co. 1898.

This illustrated book is compiled by Mr. J. J. Baddeley, Chairman of the City Lands Committee, and printed under that Committee's direction, by order of the Corporation. We presume, therefore, that it may be taken as the official exposition of its subject. The first twenty-five pages are given to a summary of the City's history, based upon Dr. Sharpe's volumes, and written in a strain that accords with its mention of Sir Walter Besant as "London's modern historian"—a somewhat confident anticipation of the work upon which he is engaged. The last ninety-two pages deal with ceremonial and other public functions, the insignia, the officials and their duties, and the administrative labours of the Common Council. The remaining space—eighty-three pages—consists of an ordinary popular handbook to the Guildhall and its offices, with a description of the fabric (transcribed from Price's "Historical Account") for which the late Sir Horace Jones designed an open roof (1864) in place of the flat one, and of that architect's Library and Museum and Council Chamber. Full prominence is given to the inscription upon Alderman Beckford's monument (designed by A. Carlini), but it should have been stated that grave doubts exist whether Beckford really addressed George III. in such terms. Gifford, in his "Works of Ben Jonson" (Vol. VI., page 481), says: "He never uttered one syllable" of the reputed speech.

*The Law of Employers' Liability and Workmen's Compensation.* By THOMAS BEVEN. London: Waterlow Brothers & Layton, Limited. 1898.

THE cry is "still they come!" This stream of works on the subject of Employers' Liability, set in motion by the Act of last year, appears to be like that classical current which ran on for ever. The work, however, at the head of this notice differs in form from others, which we have already noticed from time to time, in that it endeavours to deal with the subject in a scientific manner. It states the law in a series of propositions—some of these appear to be in the nature of truisms, and of so negative a kind as not to require statement. For example, this is No. XV.: "There is no legal liability for any occurrence which can be shown to be due to natural causes, directly and exclusively without human intervention, and which could not have been prevented by any amount of foresight and pains, and care reasonably to have been

looked for in the circumstances." Negligence is the foundation of liability, and therefore we do not want to be told that where there is no negligence there is no liability. The work is one of a good deal of interest, for some day we should like to see the law codified, but we doubt if this work in its present form will be of the practical utility of less ambitious books.

*My Home and Household Compendium.* By J. W. JARVIS and W. J. WOODS. London: Simpkin & Co. 1898.

THE full title of this publication is not that which stands at the head of this notice, but it has the additional words, "What is My Home? What Shall it be? and How Shall I Protect it?" We opened it with some curiosity, and found that it consisted for the most part of blank pages for an inventory, sandwiched between some short chapters on hiring houses and apartments, fire and burglary assurance, &c. These contain what may be called the usual information in the usual phraseology, and we have no doubt that the book will be useful to the young house agent, but it would have been more likely to get into quick circulation if the compilers had called it by a less conundrum-like title.

*Electricity in Town and Country Houses.* By PERCY E. SCRUTTON. Westminster: Archibald Constable & Co., 2, Whitehall-gardens. 1898.

THE author says that the object of this little book is to give a popular description of the many uses to which electricity can be put in domestic life, and the cost which its use entails. He has been fairly successful in accomplishing this object, although perhaps he lays undue stress on the importance of some of the applications, and does not dwell enough on the cost. There is great diversity in the subjects chosen for illustration; we have, for example, a Willans triple expansion engine of a thousand horse-power or so directly coupled on to a huge dynamo, and a few pages afterwards microscopic motors driving sewing machines, mangles, &c. There are one or two of his statements with which we do not agree. He says that a very usual size of engine for a "good-sized" country house is *thirteen* horse-power. It looks as if the author had been thinking of a 10-kilowatt dynamo. Again, he says that there is no danger to life with continuous currents up to 1,000 volts. We wonder, then, what caused the many deaths in America from contact with wires at 500 volts. Mr. Scrutton recommends that a battery charge and discharge meter should always be employed in private installations, to show at a glance the state of the battery. The expense of an ampere hour meter would be, however, in many cases prohibitive. A cell-tester costing twenty or thirty shillings is often more useful than an Aron meter costing twenty or thirty pounds. A good description is given of electric heating apparatus.

*Manual of Fire Drill.* By COMMANDER LIONEL WELLS, R.N., Chief Officer, M.F.B. P. S. King & Son.

THE first part of this little volume comprises the general instructions in force in the M.F.B. as regards duties, drill, classes, &c., followed by a short description of the apparatus used. Then come various drills with ladders and escapes, a further description of appliances, and, lastly, some useful notes as to precautions with gas, chimney fires, the stowing of a manual engine, the geography of London, water-supply, electrical communication, and first aid for burns and scalds.

The second part has the heading "Steam Fire-engines"; and whilst dealing with the appliances used by the Brigade and the methods of working different kinds of steamers, comprises under the sub-title "General Knowledge" a treatise of nearly fifty pages recording the elementary facts of heat, steam, &c.

As to the first part, the hints, if taken as an indiscriminate collection of useful notes, fulfil their purposes admirably; but they cannot be regarded as anything like a serious treatment of the Fire Brigade routine and drill. Even in their general arrangement they show lack of editing, and there is no reference to the most elementary processes of building construction, which play so important a part in fire brigade work, and to which we think the recruit's attention should be directed from the very



first. We do not like, too, to see the author use "fathoms" as the linear measurement in laying out hose. It would be better to keep to the unit of feet in all descriptions, and not to introduce nautical terms. The lengthy explanation as to laying out and working hose, by-the-bye, reminds us most forcibly of the very unpractical screw couplings which are still in use in the Brigade. Surely it is time that a bayonet and reversible coupling were introduced in order to avoid the frequent loss of time occasioned by the older appliance.

As to the second part, the directions for working a steam fire-engine are clear and concise—in fact, the style in which the preparatory arrangements are defined by a few terse expressions is admirable. We quote these words, as they should be of considerable use to engineers in charge of steam appliances for building operations:—

"Preparatory to a steamer being sent for service or to a station, the following must be attended to:—

1. Boiler to be clean in fire-box and all other accessible parts.
2. Fire-bars to be straight, in good condition, and well secured in position.
3. Regulator (or stop), safety, and other valves, injectors and gauges, steam gauges, blast and other cocks, to be in good working order.
4. Boiler to be run up with clean, fresh water to working height, as shown by gauge glass guard, care being taken that the top and bottom cocks of gauge mountings are clear and open to boiler and gauge glass (to prevent a false height of water being shown in glass); observe that there should not be less than 5 in. of water over crown plate of fire-box before lighting up.
5. Safety valves to be slightly raised or blast cocks opened whilst filling boiler, to allow escape of air.
6. Laying fire: care must be taken that both wood and coals are in dry condition, the latter being of medium-sized cubes, or rubbly.
7. No oily waste, or other inflammable material, should be put in furnace until the order is given to light fire.
8. Bunker to be filled with good, dry, rubbly coal, and sufficient wood taken to relay the fire once, in the event of it becoming necessary, through accident, to draw the fire.
9. Fire-irons, the specified number allowed, to be in good condition, and properly stowed for use.
10. Feed tank to be filled with clean, fresh water, and lid screwed down to prevent waste.
11. Funnel cover or damper to be in position.
12. Lamps to be properly trimmed with clean oil and wick ready for lighting.

Taken altogether, this little manual should be of considerable service to the Brigade, and the circulation of hints of this description among its members cannot fail to benefit the ratepayers. The idea of attempting to improve the intellectual status of the firemen with the aid of "General Knowledge" is praiseworthy, while the hints as to appliances and drill, besides helping the recruits, should prevent the older men from forgetting those matters, which is a common complaint.

Of course, this little collection of hints must in no way be confused with the standard manual of Sir Eyre Massey Shaw, which was first published in 1876, and revised in 1890. Captain Shaw's book is a manual in the true sense of the term. This little volume does not pretend to such importance.

**Sanitary Engineering.** By WM. PAUL GERHARD, C.E., Consulting Engineer for Sanitary Works, Member of the American Public Health Association, &c. New York: Published by the Author. 1898. 132 pp.

ON pages 99 and 100 of this book Mr. Gerhard, speaking of the sanitary engineer, informs us that, "in order to deserve universal respect, he should . . . avoid sensational writing or advertising, and confine himself . . . to such legitimate advertising as he may accomplish by . . . among other things . . . the dissemination of essays, or by lectures." Perhaps Mr. Gerhard will not be angry if we fit the cap on himself, for really it would be difficult to discover what other purpose than his own "legitimate advertising" the dissemination of this lecture and newspaper-article in the form of a book will serve. A man who attempts to deal with the whole subject of the education and practice of a sanitary engineer in the short space of 20,000 words, and with the subject of "Sanitary Engineering in relation to Habitations," including public buildings of all sorts, in less than 250 words, can hardly be surprised

if the result is satisfactory to no one but himself. The book is one issue of platitudes and of repetitions of statements which are the axioms of sanitary engineering; here and there are sentences of value, but, like Falstaff's bread, they do not figure very largely. At the best, the work is the barest outline of the subject of which it professes to treat, and as an outline is not by any means without value; but to dignify it with the comprehensive title of "Sanitary Engineering" is to draw upon the author the inevitable comparison between promise and performance.

**Street-Cleaning and the Disposal of a City's Wastes: Methods and Results, and the Effect upon Public Health, Public Morals, and Municipal Prosperity.** By GEORGE E. WARING, JUN., Commissioner of Street-Cleaning in the City of New York. London: Gay & Bird. 1898. Pp. 230.

THIS is a record of Colonel Waring's work as Commissioner of Street-cleaning in the City of New York, during the last three years. It is a record which would have won the praise of Carlyle, for the hero of it has reformed a corrupt administration, freed an important department from the control of selfish and unscrupulous politicians, cleansed miles of streets which had aforetime reeked with filth, inculcated cleanliness among the citizens and especially among the children who are the citizens of the future, and roused an *esprit de corps* among the scavengers of the city, who had, up to the time of his coming, been as lazy and careless as the administration was corrupt. One example of the strange influence exerted by "politics" a few years ago in the capital of the United States may be quoted. A man, who had been engaged at the request of a Tammany politician, was told by the foreman to set to work; "the man replied, 'I didn't come here to work.' He was reported at once for dismissal, and was suspended. He returned the next day, reinstated and irremovable."

Space forbids a full account of the contents of Col. Waring's book, but a brief summary will serve to show its value to British municipal engineers. The re-organisation of the force is a splendid specimen of administrative capacity; the Men's Committee and Board of Conference, for considering complaints and suggestions, being well deserving of imitation. Chapters are included on "Street-sweeping," "Carting," and "Final Disposition of Garbage," as well as of "Street-sweepings and Ashes" and "Paper and Rubbish." One chapter deals with street-cleaning, &c., in some of the chief towns in Europe, London being truly described as "the most unsatisfactory town imaginable as a place in which to study municipal administration," a good word, however, is said for its paving, which is stated to be "much better" than that of New York. The work also contains chapters written by Col. Waring's assistants, on the work of their several departments. We can recommend the book as a clear and readable account of the reforms introduced in the street-cleaning of an important city. It contains hints and suggestions of methods and results differing from English practice, and will not detract from the high reputation which Col. Waring enjoys as a writer on sanitary matters.

**The Municipal and Sanitary Engineers' Handbook.** By H. Percy Bouldnis, M.Inst.C.E., F.San.Inst., &c. Third Edition, Revised and Enlarged. London: E. & F. N. Spon. 1898. Pp. 474.

THIS is the third edition of a book a copy of the first or second edition of which is in the hands of almost every municipal engineer. The book has been almost entirely reset, new matter having been introduced throughout; thus, on p. 53 of the new edition, an important table is given, containing the result of the author's observations in Liverpool as to the cost of repairing streets paved with sets, wood, and macadam; while the old table, giving the cost of repairing macadamised roads in various towns, has been omitted. The chapters on "Wood Paving" and "Lighting Streets" have been almost entirely rewritten, and notable additions have been made in the chapters on "Curbing and Channelling," "Improvement of Private Streets," &c. Scarcely anything, however, is said about the filtration of sewage, and iron drains, and the omission of all mention of the newer types of refuse-destructors, such as

the Horsfall and the Beaman & Deas furnaces, is unfortunate. The book, however, is full of valuable information, and covers a wide field. It is undoubtedly the best handbook for the municipal engineer.

#### BOOKS RECEIVED.

THE UNIVERSAL DIRECTORY OF RAILWAY OFFICIALS, 1898. By S. Richardson Blundstone. (The Directory Publishing Company, Limited, Catherine-street, Strand.)

#### Illustrations.

##### EXAMPLES OF AMERICAN SCULPTURE.

THESE illustrations of some recent works of American sculpture are from the illustrated catalogue of the exhibition of the American "National Sculpture Society" at New York, of which we published some account recently in an article contributed by an American correspondent.

Of the examples illustrated, the most original character is shown in the group of mother and child by Miss Potter and in the bronze bust by Mr. Grafty. Mr. Moretti's design for a tomb is obviously suggested by M. Bartholomé's work. Mr. Ward's "Poetry" we like least; it may look better in a side view; as seen here it rather reminds us of Mr. Dodd's effort, described in the Parisian portion of "The Wreckers," a piece of monumental sculpture for a "Hotel de Ville," of which the French sculptor who visited his atelier observed "For America—ah! ver' good, ver' good."

##### SKETCHES WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.

THESE sketches are of some of the buildings and places of interest in Warwickshire that the Architectural Association visit on their excursion next week. An account of the proceedings of the Association will be commenced in our next issue.

#### Correspondence.

To the Editor of THE BUILDER.

##### "WHAT IS THE SCENE?"

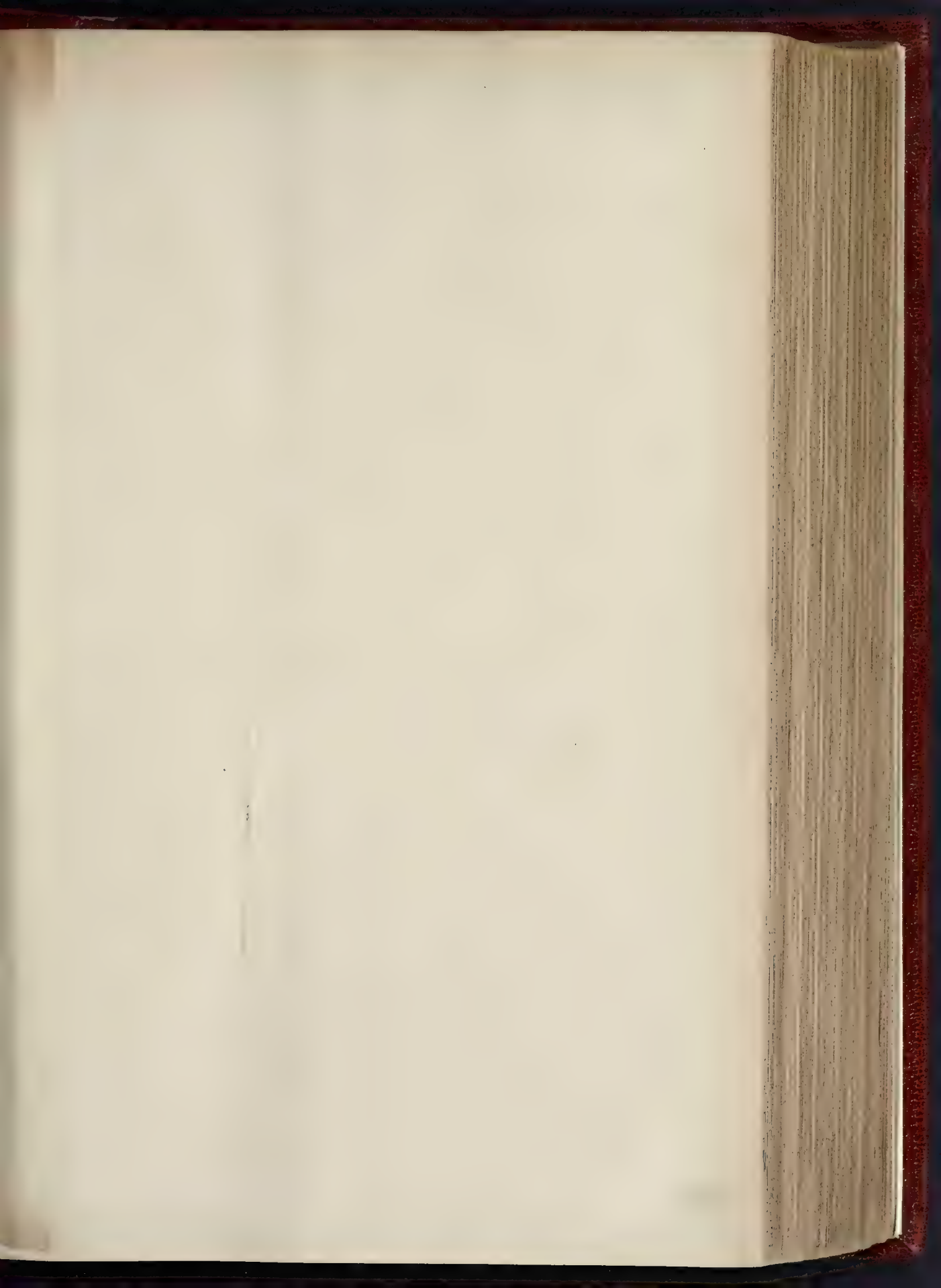
SIR,—In the article, in your issue for July 23, on the mechanism of the stage you deal with the serious difficulties of scale that arise: as when a cottage interior has to be followed by that of a palace, an open place, by a narrow street, &c. Both must be somehow reconciled with the constant, never-changing proscenium opening. This embarrassment really arises from a false conception of the limits of scenery. For many years I have been occasionally calling attention to a theory of my own, which I believe to be the true solution, and which, strange to say, seems never to have occurred to writers on the subject.

It is found in the answer to the question "What is the scene?" and, until "the scene" is clearly defined and understood, we shall wander in the dark. The "scene" is not the proscenium opening, nor the cloth "built-up" structures, or "wings." Neither is it, nor should it be, the complete presentment in its entirety of the place where the incident occurs; for, if it be a room, it seems now incumbent that we have the whole room before us; and, in the case of a square or a court, the whole square and court complete. This it is which leads to the scale embarrassments before alluded to.

No, the true meaning of "the scene" is found by applying it in the same fashion that we do in real life. An exciting incident occurs in the street or in a room. The person who witnesses it or figures in it has before him just the amount of space and objects as are immediately round the personages. He sees nothing beyond that, and his eye does not take in more. It is exactly the same on the stage. The "scene" is, or should be, the zone immediately about the characters, and no more. This zone must be a constant quantity, always of the same dimension whether for the cottage or for the palace interior. So here we have a principle to start with, and the only difficulty is to apply it practically.

At Old Drury, in Garrick's day, when the vast theatre was lit by oil lamps, surely, it seems difficult to conceive how the scenery and sets could have had sufficient illumination. It was contrived by lighting merely the centre of the stage, just as a common room would be lighted—by hanging great chandeliers over the actors' heads. It was only the zone that was thus lit, the rest was left in comparative shadow. The real scene, therefore, was in the







A FOUNTAIN OF PLenty. F. W. W.



THE YOUNG MOTHER. P.



BRONZE BUST: PORTRAIT OF LADY. -By CHARLES GRAPLY.



BRONZE ANDRON. F.

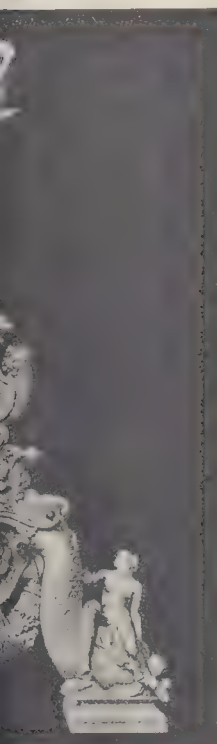




CAST.—BY BESSIE POTTER.



"POETRY."—BY JOHN Q. A. WARD.  
Colossal Original in Dome of Library of Congress.



MORE.—BY KARI BITTER.

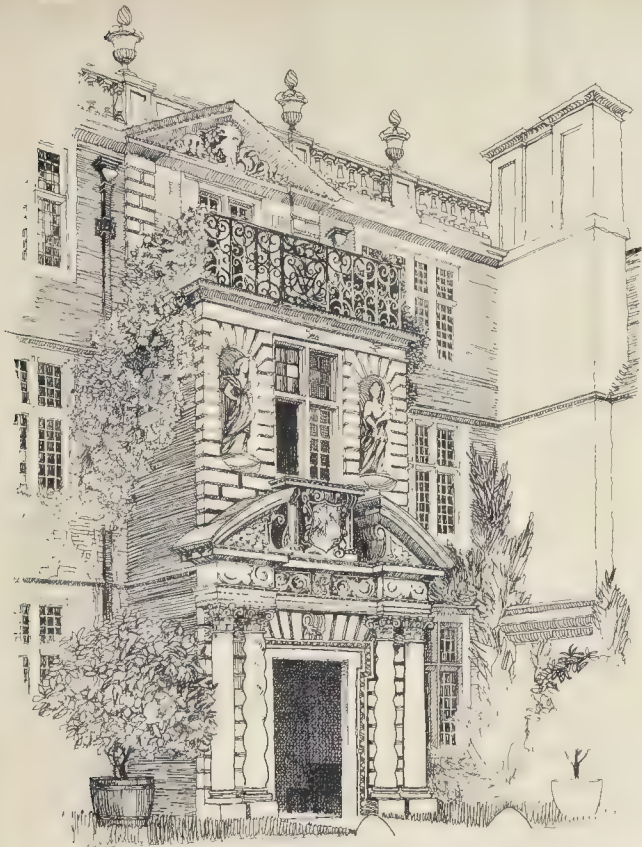


DESIGN FOR A TOMB.—BY G. MORETTI

INK PHOTO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.







THE ENTRANCE PORCH CASTLE BROMWICH.



A PORCH  
IN THE  
VILLAGE  
CASTLE BROMWICH.



THE  
ENTRANCE  
TO  
THE HALL  
BADDESLEY  
CLINTON



THE BRIDGE AT  
BIDFORD.



BADDESLEY  
CLINTON  
CHVRCH



CRINSLAW  
HALL.

A CURRIER DE.

ON CLINTON JUNE 25 1897 1/4 A.S. EAST LONDON STREET LETTER AND C.C.







MAXSTOKE CASTLE.



LEICESTER'S  
HOSPITAL WARWICK.



THE PRIORY  
WARWICK.



CAESAR'S TOWER  
WARWICK CASTLE



RAM HALL.

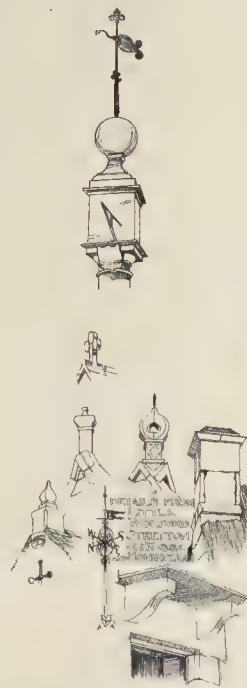
W CVRT'S GREEN DEL.







LITTLE  
WOLFORD



SALFORD HALL.



THE OLD FALCON INN, BIDFORD.



HONINGTON HALL.

WYCKES GREEN DELT



pulpit has also been introduced, and the choir as well has undergone renovation. A new feature is the introduction of two stained-glass windows at the pulpit end of the church. The windows are the work of Mr. Copland, Aberdeen. The improvements were carried out by Mr. Hanson, joiner, Turfrit, and Mr. Watson, painter and glazier, of the same place. The scheme of renovation was designed by Messrs. D. & J. R. McMillan, architects, Aberdeen.

**C.P. CHURCH, GREENOCK.**—The memorial-stone of the hall in Union-street which the Union-street U.P. Church are erecting has just been laid. The plans were prepared by Mr. J. B. Stewart, architect, Greenock, and the following are the contractors for the work:—Wm. Steel, mason; James Agnew, joiner; Clark & Selkirk, plumbers; F. Logan & Sons, gasfitters—all of Greenock.

**WESLEYAN CHAPEL, SHIREBROOK, NOTTINGHAM.**—The foundation stones have just been laid of a Wesleyan school-chapel, at Shirebrook. Mr. J. E. Goodacre, Mansfield, is the architect, and the building is being carried out by Mr. Rigley, of Kirby-in-Ashfield.

**GRAMMAR SCHOOL, DUDLEY.**—The foundation stone has just been laid of a new grammar school at Dudley. The new buildings, which will accommodate 150 boys, comprise a large central hall, five class-rooms, and head master's house, and are being erected by Messrs. Webb & Round, of Dudley, from the designs of Messrs. Woodhouse & Willoughby, architects, of Manchester. The total cost is estimated at 10,000l.

**LABORATORY, BROMSGROVE SCHOOL, BIRMINGHAM.**—The Millington science laboratory or technical department has just been opened at Bromsgrove School. The laboratory stands at the corner of the quadrangle formed by the present building of the school. It is built of sand-faced bricks, and with facings of Monk's Park stone, and a covering of purple-red Broseley tiles. The building, which is of two stories, comprises a lecture-room, chemical and physics laboratories, a dark room for photography, carpenters' and turners' shops and stores. The work has been carried out by Messrs. J. & A. Brazier, of Bromsgrove, from the designs and under the superintendence of Messrs. Lewis Sheppard & Son, of Worcester.

**NEWTON INTERMEDIATE SCHOOLS, MONTGOMERYSHIRE.**—The Newton Intermediate School buildings were opened recently by Principal Viriamio Jones. The school provides accommodation for 128 students—seventy-two boys and fifty-six girls. Separate entrances, exits, cloak-rooms, and lavatories for each sex are provided. The masters' and mistresses' rooms are placed on either side, adjoining the assembly hall, and are so placed as to command the corridors, &c. Private lavatories adjoin them. The assembly hall is centrally situated, and it can accommodate about 200 persons. The hall is capable of being divided, when required, into two class-rooms by means of a folding partition. Four class-rooms, two for boys and two for girls, are arranged round the assembly hall. An art room with north light is provided. The technical departments of the building provide for the boys' side a workshop and lavatory, and on the girls' side a laundry and cookery class-room, all specially planned for the particular subjects to be taught. The technical rooms are isolated from the school proper. On the first floor separate luncheon-rooms for boys and girls are provided, and rooms for storage. The architect of the building was Mr. H. Teather, Cardiff and Shrewsbury. Mr. W. H. Thomas, Oswestry, was the contractor, and Mr. E. Parke, Newtown, clerk of the works. The total cost of the building was 3,000l.

**INDUSTRIAL SCHOOL, EDINBURGH.**—The new day industrial school in Edinburgh, which has been erected by the School Board for the compulsory treatment of truant children under their care, is now completed. Occupying a site in St. John's Hill, where the Holyrood Free Church manse formerly stood, the buildings are in the old Scottish style, and in harmony with the architecture of the old town. The frontage is to the north. The school is substantially built, the masonry being faced with Corncockle stone; the partitions in the interior are of red brick, the lower part being glazed. On the ground floor is situated the office of the school, and adjoining there is a small bath-room. To the right of the entrance are the large play-rooms, divided by a folding partition, so that on certain occasions the rooms may be formed into one large hall. Off these play-rooms are the boys' and girls' lavatories, fitted with wash-hand basins, baths, and a hot and cold service. There is also a large play-lab. To the right of the girls, who will do the washing and cleaning required in the school, there is a wash-house, with boiler and fixed tubs, &c. In the basement there are the hot-water boilers. Corridors run from one end of the building to the other on the first and second floors. In the former is the scholars' dining hall. The kitchen adjoining has a service window communicating with the dining hall. The scullery and store-rooms open off the kitchen. Other conveniences have been arranged, and all enter from the girls' side of the school. On the other side of the corridor are two class-rooms, capable of holding forty children each, and separated by means of a folding partition. On the same floor are also the Board-room, which the

officials will also use as a dining-room, the lady superintendent's private room, and the officials' cloak-room and lavatories. The top story contains a couple of class-rooms corresponding to the ones below, a large workshop, which will probably be fitted up as a joinery, and other small rooms in which will be done some of the other dusty work which the Board may prescribe. The janitor's house is also on this flat. Mr. Robert Wilson, architect, designed the buildings, which were erected by Mr. James Kincaid, builder. The other contractors were Messrs. Charles Ritchie & Co., heating and ventilating engineers; and Mr. W. A. Campbell, painter. The cost of the building, which is certified to accommodate 100 scholars, is a little over 9,000l.—Solsman.

**TECHNICAL BUILDINGS, DORCHESTER GRAMMAR SCHOOL.**—The new Technical Buildings at the Dorchester Grammar School have just been opened. The new building has been erected on the site of two old houses at the back of the Grammar School playground and abutting on Charles-street. It was designed by Messrs. Crickmay & Sons, architects, of Weymouth and Westminster. The work has been carried out by Messrs. P. Barrett & Son, builders. The school is built of Broadway and Chickerell bricks and roofed with Broseley tiles. On the ground floor is a room 37 ft. long, 18 ft. 8 in. broad, and 13 ft. high. The first length of 25 ft. is partitioned off for a carpentry shop, and the remaining space of 12 ft. is devoted to the teaching of physics. The rooms are floored with wood blocks and provided with benches. Above this is a chemical laboratory, reached by an external roofed staircase. It is of the same dimensions as the lower room—37 ft. long and 18 ft. 8 in. broad—while the height to the roof ridge is 21 ft. It is lighted with four windows on each side and a window in the north gable.

**SCHOOL, GLAISDALE, YORKSHIRE.**—A new Board School is being erected at Glaisdale. The building is of stone, and will accommodate about 200 scholars. The size of the school-room is 45 ft. by 18 ft., whilst there is also a class-room 20 ft. by 18 ft.; and two cloak-rooms, one for boys and another for girls. Mr. E. L. Smales is the architect, and the plumbing work has been carried out by Mr. Isaac Stephenson; the painting work being executed by Mr. F. C. Agar. Mr. R. Harland, of Whitby, is the contractor. The approximate cost of the building is 2,000l.

**COTTAGE HOSPITAL, ENNSWORTH.**—The new Victoria Cottage Hospital has just been opened at Ennsworth. The site of the hospital is in North-street. The building is of red brick and stone, and has been erected by Mr. W. Poate, of Westbourne. The plans were by Mr. John Birch, Adelphi.

**COTTAGE HOSPITAL, MARGATE.**—The memorial stone of Margate Cottage Hospital has just been laid. The new building has been designed by Mr. W. J. Mercer. The design leaves the existing wards, operating theatre, bath-rooms and water-closets untouched, but provides for an entrance hall on the ground floor 5 ft. wide and a ward for two women on the right, 12 ft. by 17 ft.; and on the left a ward for four men, 10 ft. by 17 ft., exclusive of bay-window. The receiving room is a part of the large hall, 12 ft. by 14 ft., and a bath-room for men is provided adjacent to each male ward. A linen room adjoins the "Wilcox" ward and glass screens are placed in the receiving room to separate the male and female patients. On the first floor are the nurses' sitting-room, bedroom, &c. In the attic there is a bedroom for two servants, and in the basement a lower hall, nurses' sitting-room, potato store, coal cellar, and larder.

**NEW PALACE THEATRE, PLYMOUTH.**—This Theatre is now practically completed, and the preliminary work will take place very shortly. The theatre, which has been carried out from the designs of the architect, Mr. W. H. Arber (J. T. Wimperis & Arber), of Piccadilly, with the Great Western Hotel adjoining, which is also being rebuilt by the same architect, and has been incorporated in the design, forms an imposing erection, the site of the two buildings together being about 120 ft. by 140 ft. The front has been executed in terra cotta by Messrs. Doulton & Co. of Lambeth, the ground story throughout being in glazed ware. One of the principal features of the front is the reproduction in colour of two pictures of the Armada, by Sir Oswald Brierley. These are placed in two large semi-circular panels at the two ends of the theatre front on the first floor level. A wrought iron sign, executed by Messrs. Hardman, Powell, & Co., projects from the front of the theatre. Accommodation is provided for about 2,000 people. There are two tiers above the stalls and pit level. The stalls are reached by a corridor leading from the front entrance hall under the pit, thus economising the space at the sides of the house. The decoration of the interior is English in character, painted scenes of British naval and military triumphs occupying the principal divisions of the large dome over the centre of the house and other large decorative spaces, while the balcony and gallery fronts have a series of portraits of British heroes entwined in laurel. The paintings have all been executed by Mr. H. C. Brewer. In the entrance hall are two friezes by the same artist. The contractors, both for the theatre and hotel, are Messrs. W. Jones & Co., of Wandsworth Common, and the following are the sub-contractors: steel constructional work,

Messrs. Moreland & Son; electric lighting, Messrs. Veale, of St. Austell; decorations, Messrs. Hooydonk & Co.; furnishing, Messrs. Dean, of Birmingham.

**ALTERATIONS AT THE SHEFFIELD THEATRE ROYAL.**—During the last few weeks various structural alterations have been in progress at the Sheffield Theatre Royal. Mr. Frank Matcham, architect, having supervised the work. A verandah has been erected, covering the whole of the frontage and the gallery entrance at the side. New lobbies and vestibules have been provided, with mosaic flooring and ornamental ceilings. The staircase to the dress circle has been widened, and the wall and ceilings ornamented in harmony with the grand vestibule. The staircase opens into a large foyer, which leads to the dress circle, and adjoining is a lounge, which opens on to the saloon. An improvement has been effected in the seating and accommodation of the stalls, and for this purpose a staircase has been erected. At the auditorium side an improved exit has been formed into the side street. The theatre has been redecorated throughout from the designs of the architect, the predominant colours being cream, blue, and gold. The theatre is lighted throughout with electric light.

**LAUNDRY, LOW FELL, DURHAM.**—New buildings have been erected at Low Fell for the Provincial Laundries, Limited. The buildings have been erected on the site immediately adjoining the main road between Gateshead and Durham. They have been carried out with Birtley bricks, with pressed brick mouldings and arches from Mr. Foster's works at Pelaw, the upper part of the walls being rough cast. The contractor for the building was Mr. J. C. Hope, and Mr. Mackay acted as inspector, and the whole of the works have been carried out from the designs and under the superintendence of Messrs. Oliver & Leeson, architects, Newcastle-on-Tyne.

**PUBLIC BATHS, FOLKESTONE.**—New public baths at Ford were opened recently. Mr. Pope, of Folkestone, was the architect, and Mr. Fearon was the contractor.

**MUSEUM, WEST BROMWICH.**—On the 25th ult. "The Oak House," West Bromwich, with its grounds, was opened to the public as a museum and pleasure ground. Under the supervision of Messrs. Wood & Kendrick, the house has been restored to its original state, and handed over to West Bromwich.

**PUBLIC OFFICES, WINDERMERE.**—On the 22nd ult. at Windermere, Mr. W. A. Ducal, Local Government Board Inspector, held an inquiry into an application of the District Council for leave to borrow 2,500l. for the purpose of erecting Council offices. Mr. R. Walker, the architect of the scheme, said the premises would cost about 17,000l.

**STORE HOUSES FOR RESERVE VESSELS.**—Additional buildings are required at Lancaster and Bury for Her Majesty's Government, and they are to be erected immediately. The contracts have been given to Mr. Samuel Warburton, of Miles Platting. The work is to be carried out under the superintendence of Major Sharpe, R.E., Liverpool.

**HOTEL, MACHRISHAN, ARGYLLSHIRE.**—A three-story building, to replace the hotel at Machrihanish, which was destroyed by fire in February last, is about to be erected on the site of the old hotel. Plans by Messrs. Sydney Mitchell & Wilson, architects, Edinburgh, have been approved. The new hotel will be on the bay of 175 ft.

**THE NEW SHIRE HALL, DURHAM.**—The formal opening of the new County Buildings at Durham has just taken place. The site is in Old Elvet, and the estimate of the cost of erection, furnishing, &c., was 22,000l. The architects were Messrs. Barnes & F. E. Coates of Sunderland and West Hartlepool, and the building has a frontage of about 200 ft. The buildings extend in the rear to a depth of 150 ft. The front elevation is of red terra-cotta from Messrs. Monk & Newall, of Raubon, and the sides and back are of brick with bun terra-cotta dressings. A flight of steps of some 40 ft. lead up to the front entrance, which is through an arched doorway. The ground floor is occupied by the Council Chamber, committee rooms, and reception rooms, and by the offices of the Clerk to the County Council. The ante-room and Council Chamber are both large rooms. The committee rooms are large and well lighted. On the first floor are the offices of the County Surveyor, the County Accountant, the Medical Officer, and the Education Secretary. The second floor is taken up with the laboratories, libraries, &c. There is a large basement containing store rooms, &c. The chief feature of the elevation will be the tower, with its dome. The contractors were Messrs. D. & J. Ranker, of Sunderland; the clerk of works was Mr. J. G. Kilburn.

**COTTAGE HOMES, GRAVELLY HILL, BIRMINGHAM.**—New cottage homes are being erected at Gravelly Hill for the Aston Board of Guardians. The architects are Messrs. Franklin, Cross, & Nichols. The architect's plans were originally drawn for the County Surveyor of "families" of thirty, but at the instance of the Local Government Board they have been amended so as to provide for "families" of not more than sixteen, space being found in the altered designs for a total of 250 children. The new buildings face the workhouse on the opposite side of Aston-road, and are divided by a broad roadway into two sections, one for girls and one for boys. In the centre of the former is situated the superintendent's house; at the Fentham-road end



is a probationary lodge for the detention and examination of new comers, and at the opposite extremity are the church and schools and the infirmary. In each section are seven homes for the accommodation of sixteen children each, and one for twelve children. The boys' department contains work-shops, in which will be taught tailoring, shoemaking, carpentry, and fitting, and a swimming bath is also provided. The contract, which amounts to 42,000l., has been let to Messrs. W. Lee & Son, of Aston.

**MASONIC TEMPLE, GREENOCK.**—A new Masonic temple has been erected at Greenock. The new building, which is built of red sandstone from Skelmorie Quarry, stands at the junction of Argyle and West Stewart-streets. An octagonal tower rises about 60 ft. above West Stewart-street, and is surmounted by a domical roof. A full-sized figure of the patron saint of the lodge is placed at the level of the upper floor in a niche surmounted by a pediment supported on circular attached columns. The upper part of this tower has semi-circular-headed windows, and at the angles are set circular columns supporting an entablature on which the octagonal roof rests. The principal entrance is from West Stewart-street, which gives access to a staircase leading to all the floors. There is also a side entrance from Argyle-street, forming a private entrance to the lodge room, and giving access to a stair leading up to the large hall on the second floor. The apartments include a lodge-room, 20 ft. by 27 ft.; an assembly or committee-room, candidates' preparation-room, officials' room, and tyler's room. A hall, 45 ft. by 42 ft., occupies the upper floor. Messrs. Boston, Menzies, & Morton were the architects of the new building.

**MEMORIAL HALL, EDZELL, FORFAR.**—The Inglis Memorial Hall at Edzell was opened on the 22nd ult. The style is Scottish, and is the sixteenth century. Colonel Inglis has provided in the building a library and reading-room, Council Chamber for the use of the Parish Council, one large hall for public meetings, and one smaller hall which can be used either separately or combined with the main hall. Cloak-rooms, kitchen, sculleries, with store-room, &c., are attached to the halls. The windows of the library are filled with stained glass. There is on this floor the caretaker's house, entrance to music gallery, and staircase to view chamber in tower. The works have been executed by the following contractors: Messrs. J. Ford & Son, Montrose, mason work; Messrs. W. Black & Son, Brechin, joiner work and library fittings and furnishings; Mr. J. Scott, Brechin, slater work; Mr. D. McKay, Carnoustie, plumber work; Messrs. Thomson Brothers, Brechin and Edzell, plaster work; Messrs. McKenzie & Moncur, Edinburgh, heating; Messrs. Milne, Edinburgh, gas-fittings; Messrs. Alexander, Dundee, hall pendants; Messrs. Wooliscroft, Hanley, wall and floor tiles; Messrs. Salvati, Venice, Messrs. Meikle, Glasgow, and Mr. Fox Maule Boyd, Dundee, have respectively carried out the Venetian enamel mosaics, stained glass and painter work to designs by Mr. C. Ower. Mr. Robert Scott, Arbroath, has acted as clerk of works, and Messrs Wright, Aberdeen, supplied the granite. The architects are Messrs. C. & L. Ower, Dundee.

**SOUTHAMPTON MUNICIPAL LODGING HOUSE.**—The foundation-stone of the Municipal Lodging House, Southampton, has just been laid by the Mayor. The building, which is to be built on the space cleared by the demolition of the slums in the neighbourhood of Simnel-street, will cost the town over 12,000l., and it gives accommodation for 180 lodgers. The plans were worked out by the Borough Engineer (Mr. W. B. G. Bennett), the Medical Officer of Health (Dr. A. Wellesley Harris), and the drawings have been made by Mr. C. J. Hair, the architectural assistant appointed by the Corporation for the purpose. Messrs. Dyer & Sons, of Bevois Hill, are the contractors. The amount of their tender was 10,798l., to which must be added 1,000l. for laundry and kitchen fittings, hot and cold water supply, boilers, furniture, &c., and 500l. for contingencies, making the total cost 12,298l. Mr. Neville Hinxes is clerk of the works, Mr. John Dyer is general manager, and Mr. Albert Hann foreman. The building will be four stories high, with a basement at the lower end. It will be built of red bricks with stone facings, and the roofs covered with red tiles, which have been taken from the old buildings demolished on the first of the areas now cleared. The building will have a frontage of 65 ft. 2 in. to Pepper-alley, and a depth of 120 ft. 6 in., extending to within a few feet of the ancient Town Wall, which has been thrown open to view by the removal of many old buildings formerly abutting upon it. It will be rectangular on plan, covering a superficial area of 940 yards, 40 ft. high to the eaves in front and 53 ft. at the back. The narrow roadway of the building will be 12 ft. wide, 40 ft., and the building will be put back some 10 ft. farther. The main entrance is from Pepper-alley, and will open into a vestibule, beyond which, on the left side, is an office, situated to give the attendants control of a central corridor, which extends from the entrance to the rear of the building. The manager's quarters are situated in the south-east corner. On the right hand side, entered from the corridor, is the recreation and reading room, 51 ft. 6 in. long by 25 ft. wide. Part of the other space on the north side is reserved for the artisans' dwellings about to be erected facing Simnel-street, which is also to be widened as in the case of Pepper-alley; an open

yard will be left over 50 ft. wide between the two blocks of buildings. Near the recreation room and adjoining the dining room is a provision shop 25 ft. 6 in. long by 7 ft. 3 in. wide, lighted from the yard and Blue Anchor-lane. Beyond the shop is a central hall, in which is situated the stairs to the dormitories above, and also to the basement. On the left of the hall is the dining room, 51 ft. 6 in. long by 25 ft. 6 in. wide. At the end of the dining room, and in communication with the same, is the lodgers' kitchen. A lift communicates with this kitchen, the dining room, and the administrative kitchen in the basement. The lavatory, entered from the central hall, is provided with twenty-three enamelled fire-sink basins. The urinals are eight in number, and seven water-closets are provided, beyond which is the feet washing-room, and three bath-rooms. Hot and cold water supply is provided for this and all offices of the building. A work-room is provided at the end of the corridor. The lodgers' changing and locker room is 20 ft. by 12 ft. At the end of this passage is an external staircase giving access to the administrative portion of the basement below, and continued up to each floor above as an emergency exit. The accommodation in the basement is:—Administration kitchen 20 ft. by 15 ft., with a scullery and washhouse 25 ft. 6 in. by 18 ft. 6 in., with drying chambers, ironing-room, hardware, blanket, and linen stores, staff mess-room, and sleeping-room, with a lodgers' box-room, and laundry, the whole of which are lighted and approached by passages 5 ft. wide. Independent lavatory and water-closets are provided for the staff. The dormitories are designed in three separate pavilions 30 ft. apart, approached from the central staircase by open corridors. The partitions of the cubicles will be composed of coke breeze concrete on iron framing. Each cubicle has a separate window, and also a ventilator under the bed. Each floor contains sixty-three cubicles.

**NEW WAREHOUSE, ABERDEEN.**—The new stores and bonded warehouses at Virginia-street and Shore-lane, erected in extension of their present premises by the Shoreporters' Society, were recently opened. Mr. R. G. Wilson was architect, and the cost has been 10,000l. The masonry work was carried out by Mr. A. Cheyne, carpentry work by Messrs. Hendry & Keith, plumbing work by Mr. A. Campbell, and iron work by Mr. Jno. Grant, all of Aberdeen.

**PREMISES, MADDOX-STREET.**—Extensive premises are being built on the site of No. 39, at the corner of New Bond-street, by Messrs. Colls & Sons, from the plans and designs of Mr. E. K. Purchase.

**PROPOSED WORKMEN'S HOUSES, NEW BOUTHAM, LINCOLN.**—On the 22nd ult., Mr. P. Gordon Smith, Architect of the Local Government Board, and Major-General H. D. Crozier, R.E., one of the Inspectors of the Board, held an inquiry at the Guildhall, Lincoln, into the subject matter of an application by the Lincoln Town Council for sanction to borrow 6,500l. for the erection of houses at New Boultham under the provisions of Part III. of the Housing of the Working Classes Act, 1890, and 1,901, for works of street improvement. The City Surveyor (Mr. R. A. McBrair) said the plans complied with the by-laws in all particulars but one. There was one small discrepancy, and that was with regard to the passage walls; instead of being built 9 in. throughout, a portion of one side had to be built 9 in. and a portion of the other side 4½ in. Quoting from the result of a visit to 244 streets and courts, he said there were forty-nine empty houses in thirty-seven streets and courts, at a weekly rent of 6s. 6d. and under. Of these forty-nine houses, ten of them were in a dilapidated condition. There were twenty-seven houses at a weekly rental of 3s. 6d. and under. There were seven houses between 3s. 6d. and 4s. 3d. a week, and fifteen houses between 4s. 3d. and 6s. 6d. There were 10,000 houses in Lincoln, and of those at rents of 4s. 3d. a week and under only twenty-four were in really good condition. The erection of houses like those proposed would be likely to tempt the population away from those places.

**MAR LODGE, DESIDE, ABERDEENSHIRE.**—The Duke and Duchess of Fife have now entered into London. The new structure which has taken the place of the building burned down three years ago. The new building was illustrated and described in our issue for January 23, 1897. The cost of the Lodge, with the attendant works, enlargement of the garden, &c., was between 15,000l. and 20,000l. The architect was Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen. The contractors for the work were as follows:—For the Lodge, mason work, Mr. Edgar Gauld, Aberdeen; carpenter, Messrs. M'Robbie & Milne, Aberdeen; slater, Mr. James Grant, Ballater; plumbers, Messrs. J. Blaikie & Sons, Aberdeen; plaster and fireproof floors, Messrs. Stuart & Co., London; iron work, Mr. George Bisset, Aberdeen, and Messrs. J. Abernethy & Co., Aberdeen; electric bells and cooking ranges, Messrs. D. M'Hardy & Co., Aberdeen; electric lighting and heating, Messrs. P. C. Middleton & Co., Aberdeen; fibrous plaster work, Messrs. Hay & Lyall, Aberdeen; well fires, Messrs. J. Bannochie & Sons, Aberdeen; painting and glazing, Messrs. G. Donald & Sons, Aberdeen, and Messrs. Maple & Co., London. The approach has been laid out by Mr. A. G. Comming, Braemar. For the large stables, erected a short distance eastward of the Lodge, the contractors were:—Mason, Mr. George Hall, Aberdeen; carpenter, Mr. D. Macdonald, Braemar; slater, Mr. James Grant; plasterer,

Messrs. Stuart & Co., painter, Messrs. Donald & Sons; plumber, Messrs. Blaikie & Sons; and electric lighting, Messrs. Middleton & Co.

**HALL, PRESBYTERIAN CHURCH, SWALWELL, DURHAM.**—The foundation stone has just been laid of a new hall for the Presbyterian church at Swalwell. Messrs. Badenock & Bruce, of Newcastle-on-Tyne, are the architects, and Mr. Humphrey Atkinson, of Blaydon, is contractor. The work comprises a hall seated for 500, having side and end galleries and a large infants' class-room, with gallery. The building will be in brickwork, with selected Birtley brick facing, relieved with moulded red brick strings and cornices from Edwards, Ruskon.

**PUBLIC OFFICES, HENGOED, GLAMORGANSHIRE.**—The Gelligarr and Rhigos Rural District Council have entered into possession of the new public offices which have been erected by them at Hengoed. The building consists of Board-room, vestibule, offices, &c., and is built externally of Ruskon bricks and terra-cotta, there being a terrace in front, with balustrades and pedestals. The architect is Mr. James Jones, and the builders Messrs. Mainwaring & Davies, Llanbradach.

**NEW LUNATIC ASYLUM, CHADWELL HEATH, ESSEX.**—The foundation-stone of an asylum for the County Borough of West Ham (population about 260,000) was laid by the Mayor of West Ham, Alderman Ivey, at Chadwell Heath, on the 3rd inst. The buildings, which cover more than 10 acres, with 90 acres of surrounding land, will accommodate 800 patients and staff in various blocks. There will be the following accommodation: sick and infirm, 88 males and 112 females; acute, 70 males, 90 females; epileptic, 80 males, 98 females; and chronic, 112 males, 150 females. The Administration block is placed centrally, the front portion being occupied in the ground floor by the chief medical officer's, stewards', and clerks' offices, board-room, dispensary, library, &c., the museum and laboratories and assistant medical officer's rooms being on the first floor. At the back are the waiting-room, matron's apartments, recreation-hall, rooms for male and female attendants, kitchen, bakery, general stores, laundry, boiler, engine-house, and workshops. The main buildings will be two stories in height. The foundations have been put in by Messrs. Gregar & Son, of Stratford, at a cost of about 16,000l. Messrs. Leslie & Co., of Kensington, have the contract for the superstructure—210,000l. In addition to the main buildings there will be a medical officer's residence; also steward's, chief attendant's, and married attendants' a chapel to accommodate 530 adults. The total cost when finished will be about 300,000l. The architect is Mr. Lewis Angell, the Borough Engineer of West Ham.

#### SANITARY AND ENGINEERING NEWS.

**WATER SUPPLY, KIRKBY-IN-ASHFIELD.**—Major-General H. Darley Crozier, R.E., an Inspector of the Local Government Board, conducted an inquiry on the 19th ult. in the Kirkby-in-Ashfield Board Schools respecting an application from the Kirkby Urban District Council for sanction to borrow 9,000l. for purposes of works of water supply. The loan includes the following items:—For raising main and service main, 1,280l. 13s.; reservoir, 1,200l.; sinking well (on No. Man's Hill), lining, &c., 1,500l.; pumping station, including engine-room, boiler-house, &c., 1,000l.; duplicate pumping machinery, 2,000l.; and compensation to the Sutton Council and contingencies, 1,000l. The well is to be sunk to a depth of 90 ft. The engineer is Mr. W. H. Radford.

**SEWERAGE OF BALSALL HEATH, BIRMINGHAM.**—Mr. W. O. E. Meade-King, M.Inst.C.E., Inspector of the Local Government Board, held an inquiry at the Council House on the 27th ult. with regard to an application of the City Council for sanction to borrow 25,000l. for the erection of public baths at Small Heath; and 5,000l. for works of sewerage. The Lord Mayor (Mr. C. G. Beale), Mr. Hiley (Town Clerk's office), and Mr. J. Price (City Surveyor) were among those present. Mr. Hiley explained that with regard to the first application of 25,000l. for baths at Small Heath, the Corporation desired to withdraw that. It had been proved to the satisfaction of the Baths and Parks Committee that the estimates would want amending. They were prepared some twelve months ago, and prices had since risen. The estimates would be amended, and a fresh application made to the Local Government Board in due course. With regard to the present application, it was for 5,000l., to cover the cost of laying a sewer beginning in Edgbaston-road.

**WATERWORKS, NEAR HELMSLEY, YORKSHIRE.**—New waterworks to supply the villages of Nunnington, Stonegrave, East Newton, and Laythorpe, and the surrounding hamlets, were opened at Gilling on the 26th ult. Messrs. Fairbank & Son, of York, were selected as the engineers for the work, and they have had associated with them as contractors, Mr. Thomas Bell, of Market Weighton, and Mr. William Bell, with Mr. James Sharpe as clerk of works.

**MARINE DRIVE, SCARBOROUGH.**—The Scarborough Corporation some time ago submitted to the Scarborough Harbour Commissioners plans prepared by their engineer (Mr. H. W. Smith), for



the proposed approach road along the seaside to the new Marine Drive round the base of the Castle Hill. The plan shows a road 80 ft. wide. It provides for the erection of a few workshops for traders allied with the fishing industry, to be erected on piles. The Secretary of the Harbour Commissioners states, in reply, that the committee of the Commissioners recognise the public character of the work, and that, subject to certain conditions, they will recommend the Commissioners to assent to the acquisition by the Corporation of the north-east corners of the harbour, and of the acquiring of right of way over the approaches thereto to the extent of 20 ft. less than is shown in the plan, subject to certain provisions. They cannot possibly entertain the proposal for the workshops to be built on piles. The committee, after dealing exhaustively with the proposed concessions, state their feeling that these will undoubtedly involve a serious restriction of present facilities and accommodation for the trade carried on by those who use the harbour, and as compensation they propose that the Corporation shall allow the Commissioners to acquire so much of the frontage of the foreshore as may be necessary to enable them to widen the West Pier by 70 ft. for about two-thirds its full length, and to bear the cost, or, in the alternative, to contribute the sum of 5,000l. towards the cost. The widening of the West Pier would involve only a very slight encroachment on the foreshore, beyond the limit of deviation shown in a plan referred to in the Harbour Act of 1843. The matter will be considered by the Streets and Buildings Committee of the Corporation.—*Sheffield Telegraph.*

**WATER SUPPLY, MIDDLETON TYAS.**—The Richmond Rural District Council, Yorkshire, have engaged Mr. Harry W. Taylor, A.M.Inst.C.E., of Newcastle and Birmingham, to report upon the best means of supplying the village of Middleton Tyas with water.

**VENTILATION OF SEWERS.**—Dr. T. Orme Duffield, in his monthly report to the Vestry of Kensington, on the sanitary condition of Kensington, remarks, that "the hot weather has brought to its train the customary flood of complaints of offensive smells in streets arising from untrapped gullies and sewer ventilating openings. The Surveyor was requested to 'report to the committee as to any practicable action which might be taken by the Vestry to give effect in this parish to the third recommendation (printed below) of the Conference of the Engineers to the County Council and the Surveyors to the Sanitary Authorities at which this question was considered. The Surveyor's report to the committee is to the effect set out in paragraph 22b of his report of October 18, 1897, viz.:—'That the Local Sanitary Authority shall be empowered by statute to carry up any building sewer ventilating pipes. To meet possible and probable objections on the part of property-owners, statutory power, above suggested, might be made subject to the right of appeal to the Local Government Board.' The Surveyor, it may be mentioned, has discretionary power to erect ventilating pipes where necessary for the remedy of nuisance from effluvia from surface gratings, and I believe some 200 (or less than one per ten acres on an average) have been erected, a number which compares poorly with the 300 already erected in the City of London—in an area little more than a fourth that of Kensington. I should be glad to see these pipes multiplied largely. It is stated that to only one-half of the applications made for consent to their erection is consent given; but if the applications were sufficiently numerous, and this average of consents sustained, we might in the course of a few years be in a considerably better condition in respect to sewer ventilation than at present. It will be noted that the Surveyor was not requested to report in respect of the recommendation in the first resolution of the Conference, with which the Sanitary Committee concur, and which contemplates a large increase in the number of surface ventilating openings as a remedy for offensive effluvia from sewers. This recommendation should certainly receive attention at the hands of the Sanitary Authorities of the metropolis. To the County Council a letter has been written by the Vestry Clerk, from which I extract the following passages:—'Adverting to your letter of April 15 last (forwarding the report of the Conference) . . . I am directed to state for the information of the Council that the Vestry concur in the views expressed in the first and third resolutions arrived at by the Conference as follows:—1. That the closing of sewer ventilators, in response to complaints, increases the general evil, the diminution of which is to be attained by the multiplication of the ventilators at regular frequent intervals. 3. That the ventilators on buildings, or otherwise, where possible, should always be adopted in addition to surface ventilation. . . . The Vestry note the statement of the Council's Engineer, in his report to the Main Drainage Committee, 'that the general result of the Conference has confirmed the action of the committee and the Council in recent years, and that the remedy for sewer emanations is to be looked for from the maintenance of more frequent ventilating openings, both at the street level and by means of pipes carried up houses and other buildings.' In these views the Vestry concur, and I am directed to request the Council to adopt the remedy suggested, in respect of the Countess's Creek sewer in this parish, numerous complaints having been received

from parishioners and the Sanitary Inspectors of offensive smells from sewer ventilators in the line of the said sewer."

**SEWAGE SCHEME, EXMOUTH.**—Mr. H. H. Law, Local Government Board Inspector, held an inquiry at Exmouth on the 27th ult., relative to the application of the Urban District Council to borrow 34,500l. for new sewage works. The sewage scheme had been prepared by Mr. Mansergh, and Mr. Strahan, his assistant, explained that the essential feature of the plan was to have a high level sewer, taking in Withercombe, and providing for a free discharge, however great the rainfall. It was proposed to have a pumping station to take the sewage from the Exeter-road low level area to the high level sewer, for the purpose of discharge. The sewage would be discharged at a point 160 yards beyond the present outfall, and provision had been made to meet a probable increase of the population to 20,000. The high level sewer would be capable of discharging 8½ million gallons of sewage every twenty-four hours. The pumping station had been so arranged that no nuisance could arise from it. Arrangements had been made to utilise all existing sewers.

**A LEICESTER WATER SCHEME.**—The Leicester Corporation have determined to promote a Bill in Parliament next Session for a water scheme which will involve an outlay of 3,000,000l. It is proposed to combine with the authorities of Derby, Belper, Nottingham, and probably Sheffield, to secure the whole of the waters of the Upper Derwent, with the vast area of collecting grounds, and convey the water to Leicester, a distance of sixty-six miles. The project, if carried through, will secure a minimum supply of fourteen million gallons of water daily.

**THE CROYDON WATER SUPPLY.**—On the 1st inst., at the Croydon Municipal Buildings, Mr. Willcocks and Dr. Wharton, Local Government Board Inspectors, resumed their inquiry into the application of the Croydon Corporation for sanction to borrow the sum of 32,000l. for the construction of additional works at Waddon. Mr. Baldwin Laitham, C.E., of Croydon, and Westminster, giving evidence against the case put forward by the Corporation, said the capital value of the millowners' interest in the Wandle was 176,000l. He gave that as his opinion before the Royal Commission on Metropolitan Water Supply in 1887, and he thought the water power was of the same value now. He was certainly of opinion that the abstraction of 1½ million gallons daily from the well would affect the Waddon streams. The inquiry was again adjourned.

**SHIPLEY MAIN DRAINAGE.**—At a meeting of the Shipley Urban District Council, held on the 28th ult., the plans of the proposed main sewer filter beds, together with an estimate of cost, were submitted by Mr. Malcolm Paterson, M.Inst.C.E. The beds will be constructed of brick in cement, and will cover an area of 6,133 square yards, there being four each of the rough and fine filters. The total estimated cost, exclusive of contingencies, is 5,400l. The volume of sewage to be treated will be 800,000 gallons daily, and the treatment will be on the system advocated by Mr. Dibdin, who has settled the capacity and arrangement of the beds. The plans were adopted without modification, and it was resolved to advertise for contracts. It is proposed to treat trade refuse and the sewage will pass through grit depositing tanks before flowing on to the beds.

#### STAINED GLASS AND DECORATION.

**WINDOWS, ST. PAUL'S CATHEDRAL.**—The Duke of Westminster has presented two stained-glass windows to St. Paul's Cathedral. They are designed by Sir W. B. Richmond. One, representing the south transept, represents the kings of the Saxon Heptarchy. In the north transept the other window is not quite complete.

**REERDOS, ST. JOHN THE BAPTIST CHURCH, KINGSTON VALE.**—The reerodos recently placed in the Church of St. John the Baptist, Kingston Vale, to the memory of the Duchess of Teck, was dedicated on the 30th ult. The reerodos has been designed by Mr. G. F. Bodley, A.R.A., and worked in white alabaster, somewhat sparsely gilded. The central figure is that of the Saviour, with hands uplifted in blessing. The four windows of the apse have been slightly enlarged, and refilled with stained glass representing St. George, St. David, St. Andrew, and St. Patrick. In addition to these gifts, the Duke and Duchess of York, the Prince and Princess Adolphus of Teck, and Prince Francis and Prince Alexander of Teck have furnished the altar with a gilt Gothic cross and candlesticks.

**PARTIS EXHIBITION OF 1900.**—Applications for space should be sent to the Secretary of the Royal Commission, St. Stephen's House, Westminster, not later than the 20th inst.

**PUBLIC PARK, &c., WALLASEY, CHESHIRE.**—Colonel J. T. Marsh, R.E., an inspector under the Local Government Board, held an inquiry on the 20th ult., at the Public Offices, Egremont, into an application by Wallasey Urban District Council for powers to borrow 14,150l. for public parks, pleasure grounds, and other purposes. Evidence in support of the various applications was given by Mr. A. T. Wright, the Surveyor to the Board, and others.

#### FOREIGN.

**FRANCE.**—M. Bobin, Architect of Civil buildings, and M. Mariad, Architect to the Ministry of Justice and Inspector of Works at the rebuilding of the Palais Royal, the Museum of the Louvre, and the Tuileries, have received the decoration of the Legion of Honour on the occasion of the National Fête of July 14. The Jury of the Ecole des Beaux Arts entrusted with the decision of the competition of the First Class in Architecture, has awarded first-class medals to M. Jaumin, a pupil of MM. Daumet & Esquié, and M. Albreque, a pupil of MM. Guadet & Paulin. The subject was a provincial veterinary college.—It is proposed to commission a sculptor, who has not yet been chosen, to execute a statue of Michelet, which will be placed in the Pantheon near the mural paintings of Puvion de Chavannes.—M. Denys Puech has just completed a design for a monument to former pupils of the Ecole Centrale des Arts et Manufactures who have died for science or for their country.—There has just been opened at St. Maurice, near Paris, a large group of school buildings erected by the architect, M. Guyon.—At the request of the Commission of Old Paris the public is now permitted to visit the Tower of Jean Sans Peur in the Rue Etienne Marcel.—M. Osiris, well-known for his liberal art, has given for the Exposition of 1900 a prize of 100,000 francs which will be awarded under the auspices of a syndicate of the Parisian Press to the author or authors of the most meritorious work either from the point of view of humanity or from an artistic or industrial point of view.—It appears that M. Falgaire who, as the *Builder* has already announced, is entrusted with the execution of the statue of Balzac, proposes to represent him seated, and clothed with the monk's habit which the celebrated novelist was accustomed to wear in his study.—Very shortly there will be constructed a line of railway to join the town of Charolles (Saône-et-Loire) with the main line from Paray-le-Monial to Lozanne.—It is proposed to give to the sculptor Delye a commission for the monument which the town of Dijon intends to raise to the memory of Garibaldi.—There has just been discovered at Joué (Meurthe-et-Moselle) a large Merovingian cemetery, as well as some beautiful fragments of ornate architecture and rich decoration, which appear to have formed part of a Gallo-Roman temple.—It is proposed to commission from the engraver Roty a medal commemorative of the erection of the new prisons of Fresnes-les-Rungis.—The statue of the Positivist philosopher Charles Fourier, which was exhibited in the Salon this year, has been set up on the Boulevard de Clichy, at the corner of the Rue Caulaincourt. This monument is the work of M. Derré.—The construction of the new railway line from St. Sever to Dax will be commenced very shortly.—It is proposed to construct a special line of railway from Paris to Châtenay, to facilitate the entry into Paris of the Chemin de Fer d'Etat, which at present is obliged to make use of a line to the Mont Parnasse station.—M. Goutier, architect, of Vitry, has gained the first premium in the competition instituted by the town of Fougères for the erection of a municipal abattoir. M. Prioul, jun., of Paris, has gained the second premium. M. Pinel, of Fougères, the third premium.—It appears that the ramparts of Aigues-Mortes, which up to the present have been in the hands of the War Department, are about to be handed over to the Department of Public Education and Fine Art, which will be entrusted with their preservation.—The death of the architect M. Farguy, of Paris, architect, at the age of twenty-eight.

#### MISCELLANEOUS.

**PUBLIC IMPROVEMENTS, BIRKDALE, LANCASHIRE.**—At the Birkdale Town Hall recently, Colonel C. H. Luard, R.E., held an inquiry respecting the Birkdale Urban District Council's application to the Local Government Board for sanction to borrow 7,454l. for works of improvement in the township, made up of the following items:—4,250l. for works of street improvement (including main roads), 630l. for works of sewerage, 573l. for the purchase of public walks and pleasure grounds, 300l. for the erection of a fire-station, and 1,500l. for laying gas mains. Among those present at the inquiry were Mr. C. F. Hodgkinson, surveyor, and Mr. Schofield, County Surveyor.

**THE STRAND IMPROVEMENT.**—At the Middlesex Guildhall, Westminster, on the 26th ult., Mr. T. M. Beck and a special jury heard the case of "Roberts v. The London County Council," a claim for about 33,000l. as compensation in respect of the freehold interest in the premises Nos. 268, 270, and 271, Strand, which have been acquired by the London County Council for the purposes of the Strand improvement. The premises Nos. 270 and 271 are in the occupation of Mr. Nutt, at 650l. a year, on lease for twenty-one years from 1888; while No. 268 is at present vacant, the front being let as an advertising station at 130l. a year. It appeared that Mr. Nutt had to expend about 1,000l. on the premises as one of the conditions of the lease, and it was submitted on behalf of the claimant that the present rental value of the premises 270 and 271, Strand, is 600l. a year. Sir J. Whittaker Ellis



valued the property Nos. 270 and 271 for the term of the lease at 6,500l., and in reversion (deferred twelve years on the 3 per cent. table) at 15,700l.; and No. 268 at 310l. a year (on the 5 per cent. table), 7,750l.; a total of 20,950l., to which he added 10 per cent. for compulsory sale, making 23,045l., to which one year's rent of No. 268 had to be added as a *solutio* for the interference with the letting of the property subsequent to the date of the notice to treat. On behalf of the London County Council the rental in the lease of Nos. 270-271 was stated to be full, and the reversionary rental as not more than 700l., while the rental of No. 268 was estimated at 200l. From this there was a deduction for repairs, and the total valuations averaged 21,600l. The jury awarded the claimant the sum of 25,850l., plus one year's rent of No. 268, making a total of 26,100l.—*Times*.

**GLASGOW WATER-PIPE CONTRACT.—AMERICAN COMPETITION.**—On the 25th ult. the Water Subcommittee of Glasgow Corporation considered tenders for the supply of 1,000 tons of cast-iron pipes. Offers were sent in by four Glasgow and two Philadelphia firms, and it was stated that the tenders by the American firms were for 12-ft. lengths, instead of 9-ft., as specified. The Committee, in view of the great difference in the offers of the local and the American firms, agreed to re-advertise for further offers, alternately for 9 ft. and 12 ft. lengths. The two lowest were from America, viz.: 4,282l. and 4,965l. respectively. The local firms' tenders in their order were 5,041l., 5,734l., 5,910l., and 5,900l.

**SIR JOHN VANBRUGH'S HOUSE, WHITEHALL-YARD.**—In order to clear the site for the new War Office (to be erected after Mr. W. Young's designs) will shortly be demolished the premises lately occupied by the Royal United Service Institution. The house has been identified as that which Sir John Vanbrugh built for himself out of the ruins of Whitehall Palace burnt by fire in 1697, and wherein he died on March 26, 1726—the "goose-pie" of Swift's satirical lines. Some of the fire-places, good examples of their time, were taken to the Institution's new buildings, in Whitehall, on the site of Dover House stables. It stands between the old Palace Confectionary and the site of Erie House, and was since known as Stuart (or Rothsay) House, having been the residence of Sir Charles Stuart, our Ambassador to the French Court, a grandson of John, third Earl of Bute, who was raised to the peerage as Baron Stuart de Rothsay in 1828, and died, s.p., in 1845. The house has remained unoccupied since it was vacated in February, 1895, by the Institution established in 1832 as the Naval and Military Library and Museum, and incorporated under its present name in 1860. For Stuart House the members paid 205l. rent, with 105l. rates and taxes.

**LAND TRANSFER ACTS, 1875 AND 1897.**—An Order in Council declares that with respect to the county of London, the registration of land is to be compulsory on sales in the several portions of the county, and on and after the days following, namely:—Hampstead, St. Pancras, St. Marylebone, and St. George, Hanover-square, parishes, November 1, 1898. Shoreditch, Bethnal Green, Mile-end Old Town, Wapping, St. George-in-the-East, Shadwell, Ratcliffe, Limehouse, Bow, Bromley, and Poplar parishes, March 1, 1899. The remainder of the county (not including the City of London) north of the central line of the Thames, except North Woolwich, October 1, 1899. The remainder of the county, not including the City of London, January 1, 1900; and the City of London, July 1, 1900. The Act of last session enabled the Privy Council to choose one county in England wherein the registration of title to land on sale should be made compulsory. As our readers will remember, cogent reasons have been advanced by various local bodies against the choice of the so-called county of London for making the experiment; but, as will be seen, the authorities ordain otherwise, and in four of the largest London parishes where conveyances of land for building and other purposes are constantly being completed the new legislation will soon come into operation. The registry is to be established, in the first instance, at the present Land Registry Office, Lincoln's Inn-fields.

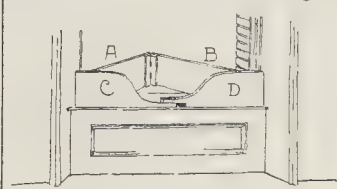
**BINSTON COURT, CHESHIRE.**—This property was withdrawn from sale at auction last month, after a bid of 25,000l. The house was built for Mr. R. W. Hudson, in the old half-timbered style, after the designs of Messrs. Grayson & Ould. The house cost, it is stated, more than 80,000l.

**BROOKS'S CLUB.**—A copy of Rowlandson's "Exhausted Gamblers" was recently sold at Sotheby's for twelve guineas. The drawing is believed to give an authentic representation of the old play-room at Brooks's club-house, St. James's-street, designed by Houlston, and opened in 1778.

**NEWCASTLE SOCIETY OF ANTIQUARIES.**—The monthly meeting of the Society of Antiquaries of Newcastle was held in the Castle, Mr. Cadwalladr J. Bates presiding. Mr. Mabery Phillips, F.S.A., exhibited an old Exchequer tally, which he explained was an antiquated form of receipt given by the Government for money deposited. It was evidently a branch of a tree, roughly squared, 22 in. long. Various notches were cut in the stick, representing money deposited at the Treasury. Mr. Phillips, Mather wrote saying that he heard a Newcastle tradesman had purchased the halls at the Friarage, Newcastle, of two bodies of local Freemen, with

the assumed object of pulling them down and building warehouses on the sites. He also wished to draw attention to the fact that a sad partial demolition of one of the older buildings surrounding Friar's Green was lately effected in the shape of large gaps made in the main west wall. Mr. Bosanquet, who had been for five weeks—the last three in conjunction with Mr. Dickie—exploring the Roman camp at Borcovicus, exhibited plans of the structure, and gave a statement as to the work which had been done and the masonry and relics discovered. The station was about four and a half acres in extent. One of the foundations uncovered was of a building which had not occurred in any other camp. It was a block immediately west of the pretorium. In other camps one street invariably ran right through the station, and the other was interrupted by the pretorium, but in this instance two buildings occurred. Mr. Bosanquet then described the relics found in and near the camp, one of the most important being a coin in excellent state of preservation.—*Newcastle Journal*.

**SAFETY WINDOW-CLEANING CHAIR.**—A model of this has been submitted to us: it is a chair, as the inventor and patented by Mr. H. Gold (London) for providing a kind of protecting fence for any one sitting on the sill of a window to clean the outside. The accompanying sketch plan will sufficiently explain the principle. A and B are boards about 14 in. deep hinged together and attached by strong hinges to C D, boards of the same depth but cut down at the centre into narrow strips, to allow room for the persons sitting on the sill. C and D project at each end so as to have a bearing against the inside of the window frame, as well as against



the wooden sill and beading, and the whole is further secured by a screw through one of the holes provided in the tailpiece of D, clamping it down on to C. We have tried it in a window and it is perfectly tight and secure. For a considerable difference in the width of windows a different size would be necessary in the chair; but to a certain extent it accommodates itself to the size of the window, the only difference being in the angle formed by A and B. The tendency of the day is towards reversible sashes, but it will be long before these are in general use, and this "chair" ought to be very useful for the safe cleaning of ordinary sash windows. When not in use it hinges up flat, and can easily be stowed away.

**THE ELECTRIC LIGHT AT DOUGLAS.**—Professor Fleming has, at the request of the Douglas Corporation, presented a report with regard to the lighting of Douglas by electricity. His report is in favour of such lighting by the Corporation.

**ROYAL BOTANIC SOCIETY.**—At the annual meeting to be held in the Gardens on the 10th inst., at one p.m., Mr. J. S. Robinson will recommend the erection of a large floral hall to serve as a Winter Garden and wherein exhibitions, flower shows, receptions, and musical promenades can be held in all seasons and in any weather, architects being invited to send in plans in competition.

**NATIONAL ASSOCIATION OF MASTER BUILDERS.**—Mr. T. Stephenson Jones, of Liverpool, presided at the half-yearly meeting of the National Association of Master Builders, which has just been held at Leicester. There was a large attendance of delegates from the chief centres of population in the kingdom. The proceedings opened with a meeting of the Council, when routine and other business was transacted. This was followed by a general meeting of the delegates, when a prolific subject of discussion was a scheme for the federation of the district associations. This was eventually adopted, and Bradford was selected as the next place of meeting. A banquet followed, when Mr. Hardington, the President of the Leicester Association, presided, and there were also present about 130 of the leading master builders of the kingdom. The following day the members took part in an excursion to the principal features of interest in the county, including the Forest and the Leicester Waterworks.

**LAUNDRY EXHIBITION.**—The sixth annual laundry exhibition will be held at the Royal Agricultural Hall, Islington, from Monday, August 22, to Saturday, September 3.

**DESTRUCTIVE FIRE AT NORWICH.**—The largest fire that has been known in the Eastern Counties for many years broke out on the 1st inst. at Norwich, and before it was subdued a large block of buildings, containing a number of shops of importance and the Public Library, were practically destroyed. The outbreak was discovered about six o'clock in the morning on premises occupied by the Hurn Rope Manufacturing Company, and almost immediately the flames spread to the adjoining premises, and finally reached the Public Library. The library, which is the largest in the county, contained at the time up-

wards of 60,000 books, and the flames spread so rapidly that but few were saved. The seat of the fire was in a very awkward angle of the city, and though some seventy firemen and policemen were soon on the spot five hours passed before the flames were got under control.

**THE NEW KEEPER OF THE ROYAL ACADEMY.**—Mr. Ernest Crofts, R.A., has been appointed Keeper of the Royal Academy in the place of the late Mr. P. H. Calderon, R.A.

## LEGAL.

### BRADFORD ANCIENT LIGHTS CASE.

In the Chancery Division of the High Court of Justice on the 2nd inst. Mr. Justice Stirling delivered judgment in the case of the Bentley Breweries Company, Limited, v. Dobson. This was an action brought by the plaintiffs to restrain the defendant, a Bradford architect and surveyor, from interfering with the access of light coming to the plaintiffs' premises called the "Cumberland Arms," Leeds-road, Bradford, by the erection of a block of dwelling-houses and shops. In the preliminary stages of the action the Court appointed Mr. Banister Fletcher to inspect the premises, with a view to reporting what steps should be taken to remedy the alleged obstruction, and it was part of the plaintiffs' case that they should not be called upon to adopt that report.

Mr. C. E. Jenkins, Q.C., and Mr. Diben appeared as counsel for the plaintiffs; and Mr. W. H. Upjohn, and Mr. Ashton Cross for the defendant.

His lordship, in giving judgment, said he had heard all the evidence as to whether the buildings as they now stood, which conformed to Mr. Fletcher's report, did or did not obstruct the access of light to the two rooms in question, and the testimony was to a certain degree in conflict; but he believed it preponderated in favour of the plaintiffs' view. Consequently, his lordship was unable to adopt the referee's report. As to granting a mandatory injunction to pull down the buildings complained of, this was a matter for the exercise of judicial discretion. His lordship believed that the defendant had been honestly misled both by the writ and the notice of motion, the terms of which only referred to one house and not to the block of houses erected by the defendant, and it seemed to him (his lordship) that the defendant had reasonable ground for coming to the conclusion that the relief sought by the plaintiffs was only in respect of that particular house. The defendant had proceeded with his building perfectly openly, and looking at the whole of the circumstances his lordship thought that there had not been any such extreme injury done to the plaintiffs by such interference with the light as to justify the making of a mandatory injunction. The result was that the plaintiffs had established an injury to their lights in respect to which they had their legal remedy in damages. What those damages should be his lordship had no means of assessing, and he directed an inquiry for that purpose. Judgment, therefore, would be for the plaintiffs, with costs, the costs of the inquiry being reserved.

## MEETINGS.

FRIDAY, AUGUST 5.

*Incorporated Association of Municipal and County Engineers.*—Meeting at Cork.

SATURDAY, AUGUST 6.

*Incorporated Association of Municipal and County Engineers.*—Meeting at Cork (concluded).

MONDAY, AUGUST 8, TO SATURDAY, AUGUST 13.

*The Architectural Association.*—Annual Excursion. Leamington.

## RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until September 13.

18,971.—**CLOSETS, CISTERN, AND WATER SUPPLY.**—P. J. Davies.—Ball valve or inlet: the cistern inlet valve (especially of the "Croydon" class) is made in the shape of an elastic plug, to answer the purpose of a washer, and to spread or expand laterally, and thus steady itself from vibration. Cistern: space is economised by employing two diaphragms or partitions arranged to form the syphon above the weeping-box and top division of the valve preventer. Outlet valve: the valve is fixed between lugs on or above the top part of the division directly above the afterflush portion of the cistern, the valve and syphon working above a—preferably—stand-up weeping pipe. Joints: these are made by casting with lead or lead alloy, on to the waste-preventer's outlet, the inlet or outlet of the basins, a kind of ring or flange with lugs for receiving bolts, &c. Silencing shield: to silence the inlet rush of waste a shield is fixed on the cistern's end to guide the water in an oblique stream.

15,777.—**KILNS FOR BURNING EARTHENWARE, &c.:** J. & C. Lengholme.—The kiln is damped by means of opening valves, set in openings made in the vaulted roof, which admit the heated air into closed iron cowls open only towards the layer of earth and placed over the roof-openings and the valves therein.

15,007.—**BRICKS:** A. Grayson.—To obviate the insertion of plugs a brick is devised which consists of an iron frame, of the size of an ordinary stock brick, cast in one piece, thicker at the bottom than at the top, to form a dovetail; in the centre of the brick's face is inserted a







Range of hoppers' houses and 24 a. or 25 p. f.	£430	14 to 28, North-st., f.	£610	By DOLMAN & PEARCE.				
Platt Farm, 67 a. r. 32 p. f.	1,500	2 to 8 (even), Spring Gardens, f.	345	Hampstead—124, Adelaide-rd., u.t. 54 yrs., g.r.	£600			
Houses, cottages, forge, &c., with fruit plantation, 11 a. r. 32 p. f.	600	45 St. John-st., f.	150	101, 103, 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999, 1,000				
Crouch House and 24 a. or 25 p. f.	4,950	Western Passage, a freehold warehouse and store	700	By EDWIN EVANS.				
By MOSS & JAMISON.		12 and 12, Mount Pleasant, c.	110	Paddington—11, Leamington-rd., u.t. 38	415			
Smithfield—7 and 8, Cowcross-st., f., r. 154.	2,060	3, 4, and 5, Mount Pleasant, c.	495	Wood Green—26, Commerce-rd., u.t. 70½ yrs.	105			
Brixton—92, Lothern-rd., f., r. 451.	575	Greenwall, two freehold cottages	145	Holloway—4, Charles-st., u.t. 45 yrs., g.r. 61.	190			
Wandsworth—24, Geraldine-rd., u.t. 82½ yrs., g.r. 74, 108, r. 35.	430	Southover, Rose Cottage, f.	135	Nunhead—68, Nunhead-grove, u.t. 72 yrs., g.r. 61, r. 281.	270			
By FROTHOK & MORRIS.		By J. C. PLATT (at Hammersmith).		By FAREBROTHER, ELLIS, & CO.				
Leytonstone—54, Fairlop-rd., u.t. 78 yrs., g.r. 61, 68, r. 421.	425	Shepherd's Bush—10 and 11, Coningham Mews, u.t. 66 yrs., g.r. nil	950	East Sheen—Park-rd., The Firs and 7½ a., f., r.	7,100			
Leyton—124 and 126, Oakdale-rd., u.t. 83 yrs., g.r. 61, 68, r. 421.	200	Fulham—24, 4, and 10, Buer-rd., u.t. 95 yrs., g.r. 34, 108, r. 421.	885	Northfleet, Kent—12 to 23 (odd), Gordon-rd., f.	600			
70, Claremont-rd., u.t. 87 yrs., g.r. 34, 108.	160	Acton—71 to 83 (odd), Osborne-rd., u.t. 70 yrs., g.r. 304.	1,050	By H. J. BLISS & SONS.				
Brentwood, Essex—Queen's-rd., Hillesdon, f., r. 401.	670	Chiswick—14 to 22 (even), Gleebe-st., u.t. 70 yrs., g.r. 171, 108.	900	Fulham—26 to 40 (even), Claxton-grove, u.t. 85 yrs., g.r. 404, g.r. nil	1,750			
Upton Pk.—Harold and Claud-rds., 94 plots of building land, f.	6,447	July 20.—By A. T. & E. A. CROW (at Sunderland).		Bethnal Green—13, Dunloot-st., u.t. 28 yrs., g.r. 165.	330			
By J. M. LEEDER & SON (at Swansea).		Haswell, Durham.—Part of Haswell Moor Farm, 17 a. f.	570	Leyton—1, Palamos-rd., f., r. 214.	330			
Swansea—26, Castle-st., f., r. 368.	6,000	Haswell Moor Cottage and 2 a. f.	150	Hoxton—26 and 28, Hoxton-st., and 2, 3, 4, 5, and 9, Byng's-buildings, f.	1,310			
By PENDERED & SON (at Rushden).		Nine plots of land, f.	105	Haggerston—9, Alfred-pl., f.	280			
Rushden, Northants.—A copyhold building estate, 134 a. f. r. 15 p.	8,300	Shotton, Durham.—The Shotton Grange Estate, 28½ a. part f. and part c.	3,541	Holloway—80 and 82, Verbury-rd., u.t. 69 yrs., g.r. 124, r. 721.	540			
A copyhold farm, 51 a. r. 3 r. 38 p.	1,400	White House Farm, 33 a. f.	1,010	By MESSRS. CRONK.				
Three enclosures, 25 a. r. 34 p. c.	650	By PENDERED & SON (at Wellingborough).		Westerham Hill, Kent.—Cudham Grange and 22 a. f.	1,250			
July 10.—By DEBENHAM, TEWSON, & CO.		Irthlingborough, Northants.—Spring-terrace Tenements, f. and c.	1,680	By C. C. & T. MOORE.				
Oxford-st.—Nos. 175, 177, 179, and 181, area 7,511 ft. f., r. 2,120.	58,550	Two freehold houses and shoe manufactory	990	Poplar—11, 12, and 13, Latham-st., u.t. 69 yrs., g.r. 154.	495			
Dunton Green, Kent.—"The Railway Tavern" b-h. and o. a. r. 5 p. f., r. 251.	2,000	Two enclosures of building land, 12 a. r. 12 p.	2,160	Stepney—15 and 17, York-rd., f., also two arches, u.t. 551 yrs., g.r. nil	700			
By FRANKLIN HOMAN.		Five copyhold closes, 53 a. r. 31 p.	1,940	Clapton—25 to 126 (even), MacLaren-st., u.t. 82 yrs., g.r. 401.	920			
Hammersmith—1, Chertsey-rd., f.g.r. 241, reversion in 67 yrs.	620	A freehold farmhouse and 3 r. 4 p.	1,770	Mill End—1, 3, and 5, Bale-st., u.t. 50 yrs., g.r. 58.	75			
Overstone-rd., f.g.r. 61, reversion in 67 yrs.	160	A freehold farm, 105 a. o. r. 5 p.	1,800	Bow—21, Athelstan-rd., u.t. 55 yrs., g.r. 41, 48.	255			
Plumstead, Kent—79, Vicarage Pk., u.t. 65 yrs., g.r. 74, 78, r. 35.	300	Broadmoor Farm, 104 a. r. 10 p.	4,000	Mill End—14, 15, and 16, Leopold-st., u.t. 64 yrs., g.r. 134, 108.	1,055			
By E. & H. LUMLEY.		Two enclosures, 24 a. o. r. 32 p. f. and c.	160	Victoria Pk.—15, Cawley-rd., u.t. 55 yrs., g.r. 61, r. 451.	440			
Sedlescombe, Sussex.—Enclosures of land, 17 a. r. 39 p. f.	300	Higham Ferrers, Northants.—A freehold enclosure, 3 a. r. 31 p.	2,350	By STIMSON & SONS.				
By MESSRS. MILLER.		By T. P. A. SAUL (at Boston).		Peckham—14, Rye Hill-pk., u.t. 67 yrs., g.r. 74, 108, r. 35.	135			
Elstead, Surrey.—Kilstead Lodge and 19 a. o. r. 13 p. c.	3,800	Kirton, Lincs.—Enclosures of land, 36 a. r. 27 p. f.	7,150	Bermondsey—84, Keaton's-rd., u.t. 48 yrs., g.r. 61, r. 501.	600			
The Hermitage and 1 a. o. r. 10 p. c. r. 604.	1,250	Kirton, Lincs.—A freehold farm, 14 a. f.	3,970	Bayswater—20 to 30 (even), Talbot-rd., u.t. 58 yrs., g.r. 604.	3,920			
By A. H. TURNER & CO.		Enclosures of land, 77 a. r. 26 p. f.	2,600	Marjebone—43, Southampton-st., f. r. 551.	910			
Piccadilly—B 6, The Albany, f., r. 101, subject to a fee farm rent of 304.	525	Kirton Marsh, Lincs.—A freehold farm, 83 a. r. 27 p. f. (including herbage rights).	1,900	10, Great Marjebone-st., u.t. 76 yrs., g.r. 201, r. 351.	2,500			
By H. H. VERNON.		Algarik, Lincs.—Enclosures of land, 39 a. r. 5 p. f.	500	Little Marjebone-st., u.t. 70 yrs., g.r. 124, r. 254, 165.	2,210			
Stroud Green—112, Oakfield-rd., u.t. 78 yrs., g.r. 88, r. 551.	500	By JOHN FRANCIS (at Tenby).		Bloomsbury—11, Dyott's-st., u.t. 72 yrs., g.r. 541, 104, r. 250.	2,500			
Holloway—29, Russell-rd., u.t. 62½ yrs., g.r. 61, r. 301.	350	Amroth, &c., Pembroke.—The Moor Farm, 36 a. r. 33 p. f.	10,600	Marjebone—61, Charlotte-st., u.t. 47 yrs., g.r. 161, increasing to 301.	1,010			
49, Alexander-rd., u.t. 64 yrs., g.r. 61, r. 301.	340	By ARBER, RUTTER, & WACHORN.		Calford—1, Rutland-pk., f., r. 221.	2,900			
By ROGERS, CHAPMAN, & THOMAS.		Mayfair—30, Berkeley-sq., and 2, Bourdon-st., u.t. 24 yrs., g.r. 61, r. 501.	2,000	Horleydown—18 to 30, Sand's-rents, f.	2,930			
Kensington—31, Earl's Court-rd., u.t. 25 yrs., g.r. 74, r. 301.	510	City of London—13 and 14, Bury-st., u.t. 60 yrs., g.r. 1404, r. 351.	540	By HENRY HENDRICKS (at Birmingham).				
80 and 82, Earl's Court-rd., u.t. 24 yrs., g.r. 86, r. 1151.	1,075	Lambeth—Vauxhall Walk, c.g.r. 201, 108, reversion in 120 yrs.	445	Edghaston, Warwick—7, Charlotte-rd., u.t. 51 yrs., g.r. 61, 115.	575			
Knightsbridge—60 and 61, Beauchamp-pl., u.t. 25 yrs., g.r. nil, r. 531.	630	Hyde Pk.—37, Upper Berkeley-st., u.t. 14 yrs., g.r. 251.	250	Birmingham—280, 281, 282, and 283, Summer-lane, f. r. 1161.	1,700			
62, Beauchamp-pl., u.t. 25 yrs., g.r. nil, r. 505.	830	Cubitt Town—465 and 471, Manchester-rd., u.t. 43 yrs., g.r. 81, r. 501.	250	Paignton-rd., f.g.r. 231, reversion in 98 yrs.	700			
185 and 187, Brompton-rd., u.t. 25 yrs., g.r. 241, 108, r. 301.	6,470	By GEORGE BRINSLEY.		By BIDWELL & SONS (at Ely).				
Lee—76, Eltham-rd., u.t. 61 yrs., g.r. 184, r. 1001.	7,450	Poplar—18 to 20, High-st., f. r. 541.	445	Sutton, Cambs.—Lawn House and 6 a. o. r. 31 p. f.	700			
Herne Hill—27, Norwood-rd., u.t. 73 yrs., g.r. 61, r. 401.	420	155, High-st., u.t. 44 yrs., g.r. 108, r. 301.	285	A freehold holding, area 40 a. 2 r. 4 p.	1,100			
Tottenham—18 to 10 (even), Grove Park-rd., u.t. 84 yrs., g.r. 271, 108, r. 301.	1,750	45, Northumberland-st., and 44 and 46, Arcadia-st., u.t. 54 yrs., g.r. 94.	575	A freehold brewery, also "The Plough Boy" p-h.	430			
By ALFRED RICHARDS.		By H. E. FOSTER & CRANFIELD.		A freehold residence and shop, r. 431.	625			
Enfield Highway.—Ordinance-rd., a freehold building estate, 16 a. o. r. 12 p.	3,800	Brixton—140, Loughborough-pk., u.t. 24 yrs., g.r. 61, r. 301.	330	The Mill Ground Allotment, 29 a. 3 r. 37 p. f.	1,000			
Ponders End.—South-st., The Limes, f. r. 501.	940	By J. HIBBARD & SONS.		Various enclosures, 86 a. o. r. 20 p. f.	2,130			
1 to 7, Langford Cottages, and 4 a. r. 31 p. f.	2,090	Clapton—22 to 23 (odd), Penmore-grove, r. 1041; also l.g.r. 241, u.t. 39 yrs., g.r. 351.	865	The Barn Ground Homestead, 6 a. 2 r. 31 p. f.	250			
1 to 22, South-pl., f.	2,175	Balls Pond—24, Kingsbury-rd., u.t. 53 yrs., g.r. 41, r. 321.	410	Enclosures of fen land, 47 a. 1 r. 9 p. f.	1,035			
Cotswold, and a cottage adjoining, f.	4,475	Cricklewood—13, Howard-rd., f. r. 361.	380	Chatteris, Cambs.—Various enclosures, 28 a. 3 r. 30 p. f.	665			
Southbury-rd., a block of building land, 12 a. r. 31 p. f.	4,700	By V. S. LEIGH.		By DRIVER & CO. (at Chichester).				
St. George's-rd., three blocks of building land, 44 a. 2 r. 32 p. f.	10,950	St. George's-rd.—Canon-st.-rd., f.g.r. 151, reversion in 69 yrs.	340	Chichester, Sussex.—Stockbridge House Farm, and part of North End Farm, 118 a. 2 r. 21 p. f., including tithe rent charge of 271, 108.	12,050			
Valley-rd., two blocks of building land, 34 a. r. 10 p. f.	9,310	Covent Garden.—Rose-st., "The Lamb and Flag" b-h., a freehold rent of 651, reversion in 17 yrs.	2,550	The Manor or Lordship of Donnington, with five freehold farms, 873 a. r. 25 p., including tithes of 1481, 148.	28,600			
By OKILL, MASON, & CO. (at Masons' Hall Tavern).		Southwark—157, Tooley-st., and "The Antiquarian" p-h., f. r. 1001.	8,100	Selsey-rd., The Blacksmith's Arms, b-h., and o. a. r. 17 p. f.	1,525			
Erinton-on-Sea, Essex.—"The Grand Hotel," u.t. 78 yrs., g.r. 604.	8,500	By E. W. RICHARDSON & SON.		Stockbridge-rd., a freehold cottage and 26 p. f.	670			
By FLEURBAEY & CO. (at Masons' Hall Tavern).		Limehouse—6, North-gate, f. r. 31, 48.	285	Stockbridge-rd., &c., four building sites, 14 a. 3 r. 35 p. f.	1,470			
Camberwell.—Lilford-rd., "The Lilford Arms" p-h., u.t. 13 yrs., g.r. 104, f. 751, 158.	580	Poplar—31, Sunnyside-st., f. r. 24, 85.	250	New-rd., nineteen building plots, f. r. 221.	420			
By TABERNACLE & SON (at Masons' Hall Tavern).		Finsbury—Ballards-lane, Stafford House, u.t. 80 yrs., g.r. 61, 108.	280	July 22.—By DICKINSON & RIGGALL (at Great Grimby).				
Strand—Villiers-st., "The Griffin" p-h., u.t. 20½ yrs., r. 5001, with goodwill.	33,600	Leyton—12, Canille-rd., f. r. 94.	280	Great Grimby, Lincs.—47, Victoria-st., area 680 yds. f.	1,250			
Battersea—13, 15, and 17, Totteridge-rd., u.t. 79 yrs., g.r. 121.	615	By T. G. WHARTON.		By DAVIS & SHOESMITH (at Halifax).				
19, 21, 25, and 27, Unswick-rd., u.t. 79 yrs., g.r. 161.	1,185	Felsham, Suffolk.—Felsham Hall and 150 a. 3 r. 20 p. f.	2,000	Greetland, Yorks.—Bank End Farm, 27 a. 1 r. 20 p. f.	1,410			
471, 475, 477, and 479, Battersea Pk.-rd., u.t. 63 yrs., g.r. 361.	210	East Ham—1, 10, 13 (odd), Redcliffe-rd., u.t. 89 yrs., g.r. 301.	845	Upper and Lower High Trees farms, 51 a. 2 r. 3 p. f.	2,740			
8, Yelverton-rd., u.t. 79 yrs., g.r. 34, 108.	540	By DOUGLAS YOUNG & CO.		Three Closes and Quarry Hills, 10 a. o. r. 16 p. f.	410			
21, Yelverton-rd., u.t. 79 yrs., g.r. 34, 108.	540	Shepherd's Bush—Orchard-rd., f. r. 301, reversion in 72 yrs.	155	Stewstone Hall and 31 a. 2 r. 20 p. f.	1,550			
Wimbledon—Trinity-rd., Rockcliffe, u.t. 67 yrs., g.r. 101, 108, r. 401.	320	Station-rd., a block of land, area 21,780 ft. f.	1,150	Gallows Pole Hill allotment, 31 a. 2 r. 30 p. f.	150			
Kingston, Surrey—3, Elm-rd., u.t. 63 yrs., g.r. 41, r. 201.	255	Camberwell—11 and 13, Belinda-rd., u.t. 69 yrs., g.r. 101, r. 301.	1,010	By WARD & CHOWEN (at Tavistock).				
By HUSSEY & SON (at Tiverton).		Streatham—37, Glenelg-rd., f. r. 401.	630	Pettery, Devon.—Standon, otherwise Stannon Manor Estate, 160 a. 1 r. 4 p. f.	2,900			
Uffington, Devon.—Hacken Hill, enclosures, 72 a. r. 27 p. f.	400	Lewisham—112 and 114, Leed-rd., u.t. 59 yrs., g.r. 171, r. 951.	750	By MOORE, GARRARD, & SON (at Framlingham).				
By H. J. CHEPPIES (at Saffron Walden).		Depford—9, 11, and 13, Knott-st., u.t. 58 yrs., g.r. 151, 158.	190	Earl Soham, Suffolk.—The White House Farm, 123 a. o. r. 25 p. f.	1,165			
Radwinter, Essex.—Jenkinbos's and Mortlock's Farms, 165 a. 3 r. 39 p. f.	1,300	Charlton, Kent—28 to 36 (even), West-st., u.t. 45 yrs., g.r. 111, 28.	350	Barnham, Suffolk.—Self's Farm, 7 a. 2 r. 30 p. f.	22			
By FLEURBAEY & CO. (at Masons' Hall Tavern).		Wallington.—Manor-rd., Heathfield, u.t. 69 yrs., g.r. 101, r. 301.	630	The High House Farm, 71 a. 2 r. 27 p. f.	670			
Camberwell.—Lilford-rd., "The Lilford Arms" p-h., u.t. 13 yrs., g.r. 104, f. 751, 158.	580	By BAKER & SON.		Six enclosures, 43 a. 2 r. 22 p. f.	400			
By TABERNACLE & SON (at Masons' Hall Tavern).		Brixton—69, Acre-lane, u.t. 66 yrs., g.r. 21, 158.	660	Police station, business premises, and 3 r. 20 p. f.	175			
Strand—Villiers-st., "The Griffin" p-h., u.t. 20½ yrs., r. 5001, with goodwill.	33,600	By T. H. CURRIE.		Two freehold cottages, blacksmith's shop, and 2 r. 12 p. f.	730			
Battersea—13, 15, and 17, Totteridge-rd., u.t. 79 yrs., g.r. 121.	615	Neasden—10, Lansdown-grove, u.t. 88 yrs., g.r. 61, r. 381.	415	By RICHARD AUSTEN (at Chichester).				
19, 21, 25, and 27, Unswick-rd., u.t. 79 yrs., g.r. 161.	1,185			Sidlesham, Sussex.—Easton Farm, 390 a. o. r. 2 p.	10,750			
471, 475, 477, and 479, Battersea Pk.-rd., u.t. 63 yrs., g.r. 361.	210			Enclosures of land, 20 a. 3 r. 36 p. f.	580			
8, Yelverton-rd., u.t. 79 yrs., g.r. 34, 108.</								

## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Shops and Dwelling Houses.	Plymouth Town Council	Premium, 200l.	[Sept. 24]

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Repairs, &c., to the Park.	Croydon Union	F. West, 32, Coombe-road, Croydon.	Aug. 8
Engine House, &c.	Heckmondwick Ind. Co-op. Soc. Ltd.	A. A. Stutt, Archt. Heckmondwick.	Aug. 9
Alterations to Parkmore Mount, &c., &c.	Heckmondwick Ind. Co-op. Soc. Ltd.	Buttery & Birds, Archt. Heckmondwick.	do
House, Halifax-road, Brighouse, Yorks.	.....	Sharp & Waller, Archt. 32, Bedford-road, High Wycombe.	do
Cemetery Works, &c., Bangor, &c.	Rural Board	T. Morgan, Bangor, Ireland.	do
Oliver, Factory, Castelford, Leamington	.....	T. M. Morgan, Bangor, Ireland.	do
Quarrying and Breaking stone, &c.	.....	W. J. French, Archt. 2, St. James's, Dublin.	Aug. 10
Additional to Schools	.....	T. M. Morgan, Bangor, Ireland.	do
Main Road Improvements, Llanvach	.....	T. M. Morgan, Bangor, Ireland.	do
Bridge Works, Gillingham	.....	T. M. Morgan, Bangor, Ireland.	do
Brick Bridge over Mill-brook	.....	T. M. Morgan, Bangor, Ireland.	do
Service Reservoir, Cat Iron Main, &c., &c.	.....	T. M. Morgan, Bangor, Ireland.	do
*Vagrant Cells at Workhouse	Peterfield Union	.....	do
Street Works, Stanley, &c.	.....	.....	do
House at Waterworks, Wotton	.....	.....	do
Refrigerated Ice Boiling at Work	.....	.....	do
Sanitary Works, Golden Club, &c.	.....	.....	do
Refrigerated Ice Boiling at Work	.....	.....	do
Fire Shop, Bally, Yorks.	.....	.....	do
School, Oakdale	.....	.....	do
Two Houses, Long Carlisle, Barnley	.....	.....	do
Penal Institution, &c., &c.	.....	.....	do
Cast Iron Pipe, Hydrants, &c.	.....	.....	do
Traps, &c., &c.	.....	.....	do
Additional to Workhouse	.....	.....	do
Schools	.....	.....	do
Additional to Farm Buildings, &c.	.....	.....	do
Shop and House, &c., &c.	.....	.....	do
School Works, Sturry, Kent	.....	.....	do
Hospital, &c.	.....	.....	do
Walls, &c.	.....	.....	do
Extension of Shed, &c., &c.	.....	.....	do
Steel and Ironwork for Road Railways	.....	.....	do
Seven Cottages, The Cross, &c.	.....	.....	do
Fifteen Cottages, Johnson-street, &c.	.....	.....	do

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Concrete Wall, Abbey.	Bonsey (Hants) Corp.	Borough Surveyor, Market.	Aug. 10
Bag-Tank, &c., &c.	Director of Contracts	Manager, Malta Railway.	Aug. 18
Additional to Workhouse	Essexwood (Yorks)	F. H. Robinson, Union.	Aug. 22
Houses, &c., &c.	.....	.....	do
*Farm Extension Works	Oxford Corp.	W. H. White, Town Hall, Oxford.	do
*Cot and Farm Buildings	.....	.....	do
Pauper, Children's Homes	Blackburn Union	Stratton & Gradwell, Archt. Richmond-st., Blackburn.	Aug. 22
*Public Baths	Walthamstow U.D.C.	Spalding & Cross, 15 Queen's-st., Walthamstow.	do
*Pipe Sewer	.....	.....	do
Technical College, Green Terrace	Bunderland Corp.	Potts, Son & Hemmings, Archt. 15, Green Terrace, Bunderland.	Aug. 23
Institute, Park-road, Consett, Durham	Committee	Iron Co. Office, Black-burn, &c., &c.	Aug. 24
Superstructure, Central Power Station	.....	.....	do
Schools and House, Newstead	Alston Sch. Bd.	T. E. Davidson, Archt. 33, Newcastle-on-Tyne.	do
Hotel, Bridge-street, Gateshead	.....	.....	do
Church, &c., &c.	.....	.....	do
Cottage, Glasgow, &c.	.....	.....	do
Supply and Laying Cast-iron Pipes	.....	.....	do
Additional to House, Wansford	.....	.....	do
Villas, &c., &c.	.....	.....	do
House, Crescent-avenue, Whitby	Capt. J. Willis	H. Walker, West 61, Estate, W. Yorks.	do
Three Villas, Crescent-avenue, &c.	.....	.....	do
Uppan road, &c., &c.	.....	.....	do
Fourteen Houses, Hunslet, Leeds	A. Shire	.....	do
Rebuilding Edinburgh Castle Inn	.....	.....	do
Schools, &c., &c.	.....	.....	do
*Road-making	.....	.....	do
*Hall at Owen College	.....	.....	do
*Eight Cottages	.....	.....	do
Additional to Schools, Llanvach, &c.	.....	.....	do
House, &c., &c.	.....	.....	do

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Surveyor and Inspector of Nuisances	South Hams D.C.	250l. per annum	Aug. 11
Architectural Assistant	Beckenham U.D.C.	81. 5s. per week	Aug. 18

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. & vii. Public Appointments, pp. xiv. xv. & xvi.

Lower Park-road, &c., f.g.t. 1304, reversion in 19 yrs.	£3,450	Market Garden Land, &c., &c., f.g.t. 34 p. f.	£1,125	By WETHERALL & GREEN.	
Peckham—85 to 117, Bird-in-Bush-rd., f.g.t.	4,950	Little Knell Field, &c., &c., f.g.t. 31 p. f.	625	Shepherd's Bush—Shepherd's Bush-rd., f.g.t. 121, &c.	£2,200
By FIELD & SONS.		Guston Marshes, 38 a. 1 r. 2 p. f.	900	u.t. 81 yrs., g.t. 93, &c.	
Stockwell—103, 103a, and 103b, Stockwell-rd., f.g.t. 254.	4,275	By HERBERT S. R. STANFORD (at Framlingham).		Bayswater—13, 14, 14A, 15, and 16, Pembroke-mews, f.g.t. 1, 1954, &c.	2,550
Bermondsey—78 to 86 (even), Leroy-st., u.t. 82 yrs., g.t. 264, &c.	600	Badingham, Suffolk.—The Red House Farm, 157a, f.g.t. 3 p. f.	1,600	5 and 6, Portobello-mews, f.g.t. 1, 1954, &c.	600
Southwark—3, Quilp-st., f.g.t. including goodwill.	1,710	The White House Farm, 121a, u.t. 3 p. f.	1,310	Shepherd's Bush—17, 23, 25, 27, 37, and 39, Melrose-gardens, u.t. 78 yrs., g.t. 244.	2,570
By BARTON, SMITH, & CO.		Four enclosures, 144 a. u.t. 16 p. f.	250	31, Westwick-gardens, u.t. 80 yrs., g.t. 155, &c.	360
Streatham—9 and 11, Natal-rd., u.t. 85 yrs., g.t. 101, &c.	450	Three freehold cottages	150	Hammersmith—2, 7, 10, 12, 13, and 14, Dewhurst-rd., u.t. 81 yrs., g.t. 484, &c.	2,530
By HARMAN BROS.		By BIDWELL & SONS (at Cambridge).		Kentish Town—68 to 78, 82 to 100 (even), Barbours-lane, u.t. 53 yrs., g.t. 67, &c.	4,320
Stoke Newington—23, Kyverdale-rd., u.t. 82 yrs., g.t. 94, &c.	530	Cherryhinton, Cambs.—Two building plots, 2 a. 2 p. f.	270	Regent's Pl.—53 and 55, Princess-rd., u.t. 54 yrs., g.t. 164, &c.	750
Hampstead—12, Lawn-rd., u.t. 52 yrs., g.t. 214, &c.	490	By LLOYD & THOMAS (at Carmarthen).		Brompton—8, St. Oswald's-rd., u.t. 73 yrs., g.t. 104, &c.	315
By J. W. NEIGHBOUR.		Conwil—Elvet, Carmarthen.—Nant-y-hwydd Farm, 143 a. u.t. 2 p. f.	910	Pimlico—160, Ebury-st., u.t. 23 yrs., g.t. 74, &c.	1,060
Stoke Newington—39 and 41, Croyford-rd., u.t. 93 yrs., g.t. 164, &c.	780	July 25.—By HENRY HOOPER.		101, Ebury-st., &c., Little Ebury-st., with stables, u.t. 22 yrs., g.t. 84, &c.	730
By HUMBERT & FLINT.		Kensington—Perham-rd., f.g.t. 774, u.t. 73 yrs., g.t. nil.	1,080	Wandsworth—14 and 16, St. John's Hill Grove, u.t. 53 yrs., g.t. 84, &c.	595
Highbury—Highbury Hill, f.g.t. 584, &c., reversion varying from 51 to 66 yrs.	10,605	Hackney—296, Mare-st., f.g.t. 100.	2,500	18, 20, and 24, St. John's Hill Grove, f.g.t. 84, &c.	1,230
July 23.—By STEPHENSON & ALEXANDER (at Cardiff).		318, Mare-st., f.g.t. 100.	1,300	19, 21, and 23, St. John's Hill Grove, f.g.t. 84, &c.	1,135
Pendoylan, Glamorgan.—Maesyrhau Farm, 67 a. u.t. 27 p. f.	3,000	Marlyebone—112, Marlyebone-rd., u.t. 24 yrs., g.t. 44, &c.	495	St. John's Hill Grove, f.g.t. 121, 125, reversion in 53 yrs.	360
By MESSRS. SPELMAN (at Norwich).		Paddington—31, Titchborne-st., u.t. 10 yrs., g.t. 72, &c.	385	Seahurst—27 to 33 (odd), Princess-rd., f.g.t. 121, &c.	1,490
Cantley, Norfolk.—House, farm premises, and 14 a. u.t. 35 p. f.	300	Belgrave—Belgrave-rd., f.g.t. 100, u.t. 26 yrs., g.t. 44, &c.	7,300	Tottenham—30 to 44 (even), Somerset-rd., f.g.t. 200.	2,600
Freehold house and Little Marsh, 1 a. 1 r. 22 p. f.	710	City of London—87 and 88, Leadenhall-st., u.t. 15 yrs., g.t. 274, &c.	1,170	Islington—27, Liverpool-rd., f.g.t. 92, &c.	505
Enclosures of marsh land, 26 a. 1 r. 25 p. f.	125	Belgrave—Belgrave-rd., f.g.t. 100, u.t. 26 yrs., g.t. 44, &c.	1,170	By PERKINS & SON (at Raunds).	
Smallburgh, Norfolk.—A freehold residence and 1 a. 2 r. 1 p. f.	480	Eaton-pl., f.g.t. 40, u.t. 25 yrs., g.t. 104, &c.	450	Raunds, Northants.—A plot of building land, f.g.t. 11 p. f.	700
Worstead, Norfolk.—A freehold house and 2 a. u.t. 29 p. f.	250	Paddington—Eden-rd., f.g.t. 94, u.t. 64 yrs., g.t. 24, &c.	1,060	An enclosure of pasture, 6 a. 3 r. 4 p. f.	250
Homington, Norfolk.—The "Bell Inn" and 2 a. u.t. 1 p. f.	910	By BUCKLAND & SONS.		By CASTLETON & GIBBINS (at Carlisle).	
A freehold farm, 28 a. 1 r. 23 p. f.	605	Leyton—13, Vicarage-rd., f.g.t. 324, &c.	450	Carlisle, Cumberland.—The Broom Hill Estate, 139 a. 3 r. 38 p. f.	5,575
Five enclosures, 22 a. 1 r. 20 p. f.	260	Highbury—10, Highbury-rd., f.g.t. 80, &c.	1,050	Eterby House, f.g.t. 704, &c.	1,060
North Walsham, Norfolk.—Two plots of building land, 5 a. u.t. 15 p. f.	235	Brentford, Middx.—The Brent Wharf, f.g.t. 80, &c.	2,400	By C. F. MOORE (at Cirencester).	
By NETHERSOLE & HONEYBALL (at Canterbury).		142 to 145, High-st., &c. and 4 to 8, Church-alley, f.g.t. 180, &c.	210	Ashton Keynes, Wilts.—Cove House Farm, 86 a. u.t. 11 p. f.	2,050
Ash-ent-Sandwich, Kent.—Enclosures of arable, 64 a. 1 r. 37 p. f.	1,605	Peckham—Asylum-rd., f.g.t. 304, u.t. 49 yrs., g.t. nil.	555	The Leigh Farm, 153 a. 1 r. 22 p. f.	3,350
Enclosures of marsh, 116 a. 2 r. 15 p. f.	1,145	Bethnal Green—Green-st., f.g.t. 51, &c., reversion in 27 yrs.	175	Bows and Wires Close, 5 a. 2 r. 1 p. f.	160
Farmer Grange Farm, 34 a. 1 r. 11 p. f.	1,000	Poplar—East India Dock-rd., f.g.t. 44, &c., reversion in 35 yrs.	240	Colin St. Dennis, &c.—Colin St. Dennis and Calcut Farm, 413 a. 1 r. 1 p. f.	4,400
		Brighton—33, Marine-parade, f.g.t. 200, &c.	3,950		
		Chapel-rd., Malden House, f.g.t. 654, &c.	870		



[illegible]

LONDON.—For alterations to saloon bar, &c., "Albany Arms," Albany-road, S.E., for Mr. C. Cook.—  
Nash ..... £260 0 0 Simpson & Cove\* ..... £250 0 0  
W. E. Hill ..... 375 10 \* Accepted.

LONDON.—For building villa, Catford Bridge, for Mr. H. Burton. Mr. W. Woodcock, architect, Bedford-row, W.—  
Balfour Bros. .... £1,400 0 0 Lyard ..... £800 0 0  
Simpson & Cove ..... 999 10 W. Dean ..... 750

LONDON.—For the supply of dynamos and engines at the Northern Hospital for the Metropolitan Asylums Board.—  
Alternative figures for different machines.

Dynamos and Engines.	Apparatus.
Ernest Scott & Mountain, Ltd. ....	£110 0
Clarke, Chapman & Co., Ltd. ....	175 0
Thomas Parker, Ltd. ....	180 0
Easton, Anderson, & Gosselin ..... 180 0	75 0
P. R. Jackson & Co., Ltd. ....	180 0
Indo rubber, Gutter-Perkins and Telford, Works Co., Ltd., Surrey-town, E. ....	200 0
Crompton & Co., Ltd. ....	180 0
Mather & Platt, Ltd. ....	180 0
Siemens Bros. & Co., Ltd. ....	180 0
Johnson & Phillips ..... 180 0	180 0
Electric Construction Co., Ltd. ....	180 0
J. H. Holmes & Co., Newcastle-on-Tyne ..... 180 0	180 0

\* Accepted.  
Consulting Engineer's revised estimate, £1,000.

LONDON.—For alterations, new projections to contain additional lavatory and water closets, at the Strand Union, Messrs. W. S. Cresswell & Kelwick, architects, 18, Outer Temple, Strand. Quantities by Mr. W. T. Fairbairn.  
Alan & Stanley ..... £500 0 0  
Lawrence ..... 575 0 0  
Marredew & Wort ..... £500 0 0  
T. G. Sharrington ..... 525 0 0

LONDON.—For additions, &c., to Chapel, St. John's-square, Clerkenwell, for the Rev. J. E. Wakerley and others. Mr. A. Wakerley, architect, 24, Market-place, Leicester. Quantities by Messrs. Conderley, Selby, & Conderley, Westminster.—  
Simpson & Sons ..... £2,500 0 0  
Barratt & Power ..... 675 0 0  
Gen. Munday & Sons ..... 600 0 0  
B. E. Nightingale ..... 647 0 0  
J. Christman & Sons ..... 630 0 0  
Holloway Bros. .... 925 0 0

LONDON.—For internal painting, &c., at the Infirmary, Wandsworth, for the Clapham Union Guardians.—  
C. W. Street ..... £1,400 0 0  
H. Roffey ..... 1,000 0 0  
Arthur H. Jones ..... 975 0 0  
C. Goring ..... 800 0 0  
W. Johnson & Co. .... £805 0 0  
H. Heather\* ..... 700 0 0  
F. W. Harris ..... 665 0 0  
D. McNeil ..... 600 0 0  
\* Accepted.

PORTR TALBOT (Wales).—For the erection of caretaker's house, at the intermediate school. Mr. Frank B. Smith, architect, Port Talbot.—  
Evan Thomas ..... £500 0 0  
S. Rees ..... 500 0 0  
Leventon Bros. .... 400 0 0  
Stephens & Co. .... 400 0 0  
Mathews & Co. .... £450 0 0  
Morgan, Coe ..... 425 0 0  
John Davies, Aber-avon (accepted) ..... 400 0 0

SALTASH (Cornwall).—Accepted for the erection of a Wesleyan schoolroom and renovation of chapel, at Forder, for the trustees Mr. Edgar M. Leest, architect, Devonport and Saltash.—  
R. J. Taylor & Co., Mutton ..... £310

**C.B.N. SNEWIN**  
MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and TIMBER MERCHANT,  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
HATTON GARDEN, and 29, RAY STREET,  
FABRICATION ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.  
Telephone No. 274 Holborn. Tele. Address: "SNEWIN, LONDON."

STOCKTON-ON-TEES.—For additions to schools, Bailey-street, and Bowditch-lane, for the School Board. Mr. Arthur Harrison, architect, 69, High-street, Stockton. Quantities by architect.—

Basileys-street School Additions.  
J. Davison ..... £200 0 0  
A. Atkinson & Co. .... £250 0 0  
A. J. Cooke ..... 150 0 0  
\* Accepted subject to Educational Department's approval (now obtained).

Mr. J. L. Lane School Addition.  
J. Davison ..... £500 0 0  
A. J. Cooke, Stockton\* ..... £200 0 0  
A. Atkinson & Co. .... 630 0 0  
\* Accepted.

WEMBLEY (London). For the erection of new south aisle, organ chamber and porch, and alterations to St. John's Church. Mr. Hayward Brakspear, architect.—  
F. G. Winter ..... £3,000 0 0  
Dove Irons ..... 3,750 0 0  
H. Haynes ..... 3,500 0 0  
John Bentley ..... £3,300 0 0  
Belham & Co. .... 3,100 0 0

WHITBY.—For the erection of villa residence, Goshall. Mr. F. H. Smale, architect, 5, Flowergate, Whitby.—  
John Brough ..... £1,100 0 0  
A. Falfarman ..... 1,000 0 0  
John Hutchison ..... 1,000 0 0  
Whitby (accepted) ..... £1,060 0 0  
C. Winterburn ..... 960 0 0

WHITEHAVEN.—For additions, &c., to Board schools, Arleford. Mr. J. S. Moffat, architect, 53, Church-street, Whitehaven.—  
Chapple & Son ..... £600 0 0  
Joseph Green, Pardshaw (accepted) ..... £518

EIGHT HOUSES, OAK GROVE, CRICK.—In our issue for June 15, page 517, we stated that the architect for these houses was Mr. Ernest Owen. We are now informed that Mr. Owen is the freeholder of the land, and that he has arranged the advances under ordinary building agreement to the extent of £20,000.

#### TO CORRESPONDENTS.

J. P. C. (Amount should have been stated).  
NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
We cannot undertake to return rejected communications.  
Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT REWARDED.  
We are compelled to decline pointing out books and giving addresses.  
Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.  
All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and sent to the Editor.

**J. J. ETRIDGE, Jr.**  
SLATE MERCHANT,  
SLATER and TILER.

ESTIMATES GIVEN FOR  
SLATING AND TILING,  
To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,  
Oakeley - Portmadoc,  
And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to  
BETHNAL GREEN SLATE WORKS,  
BETHNAL GREEN, LONDON, E.

#### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances (payable to DOUGLAS FOURDRIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (by prepaying at the Publishing Office, 10s. per annum or 4s. 6d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

#### THE BATH STONE FIRMS, Ltd.

BATH.  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

#### HAM HILL STONE. DOULTING STONE.

The Ham Hill and Douling Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son The Douling Stone Co.)  
Chief Office:—Norton, Stoke-under-Ham, Somerset.  
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyss-l and Metallo Lutz Asphaltic Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

SPRAGUE & CO'S, Ltd.,  
INK-PHOTO PROCESS,  
4 & 5, East Harding-street,  
Fetter-Lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.  
METCHEM & SON, 8, PRINCE STREET, ST. GEORGE'S ST. WESTMINSTER.  
"QUANTITY SURVEYORS' DIARY AND TABLES," For 1898, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

THE  
**French Asphalte**  
COMPANY,

Suffolk House, Cannon-street, E.C.  
SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS, DAMP COURSES, AREAS, ROOFS, WASHHOUSE AND DAIRY FLOORS, &c., &c.

This Asphalte was chosen to be laid at Sandringham, on the new General Post Office, and other important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

**IRON CISTERNS.**

**F. BRABY & CO.**

VERY PROMPT SUPPLY.

LARGE STOCK READY.

CYLINDERS FOR HOT-WATER CIRCULATION.

Particulars on application.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL:  
6 and 8, HATTON GARDEN.

GLASGOW:  
47 and 49, ST. ENOCH-SQUARE.

BRISTOL:  
ASHTON GATE WORKS, CORONATION-RD.



# The Builder.

VOL. LXXV. No. 2897.

AUGUST 13, 1898.

## ILLUSTRATIONS.

### Dundee Architecture:—

The High School (the late Mr. John Angus); the Custom House (the late Mr. Taylor); the Royal Infirmary (Messrs. Coe & Godwin); and Lochee Free Library and Baths (Mr. J. Murray Robertson)	Double-Page Ink-Photo.
The Church of St. Mary the Virgin; St. Patrick's R.C. Church (Mr. T. Martin Cappon); Baptist Church (Mr. T. Martin Cappon); St. Enoch's Church (Mr. T. S. Robertson)	Double-Page Ink-Photo.
The Caledonian Insurance Company's Offices (Mr. J. Murray Robertson); Tyffe's Buildings, Nethergate (Mr. J. Murray Robertson)	Double-Page Ink-Photo.
Some Details of the Oak House, West Bromwich	Double-Page Photo-Litho.

### Blocks in Text.

#### Dundee Architecture:—

Dudhope Castle	Page 140
A Common Form of Gable	" 141
Morgan Tower, Nethergate	" 141
The Town House	" 141

#### Dundee Architecture (continued):—

Prudential Assurance Buildings	Page 142
The Court House	" 143
Park U. P. Church	" 144
Technical Institute	" 145

## CONTENTS.

The Architecture of Our Large Provincial Towns. XVII.—	Books Received	129	Stained Glass and Decoration	157
Dundee	Association of Municipal and County Engineers	129	Foreign	157
Notes	The New Lunatic Asylum at Bangour	153	Miscellaneous	157
The Architectural Association	Appointment of Architect, Union Workhouse, Salford	154	Capital and Labour	158
Archæological Societies	Hydraulic Ram Problem	154	Legal	158
Illustrations of Dundee Architecture	The Students Column: Sound, Light, and Heat—VII.	154	Meetings	159
The Oak House, West Bromwich	Obituary	155	Recent Patents	159
An American View of Church Architecture	General Building News	155	Some Recent Sales of Property	160
Competitions	Sanitary and Engineering News	156	Tenders	161

### The Architecture of Our Large Provincial Towns.

XVII.—DUNDEE.



ONSIDERING the age, the historic importance and the present size and wealth of Dundee, it is disappointingly wanting in architectural interest. The want, it is true,

may be accounted for, as far as old buildings are concerned, by the fact that its history is chiefly a record of sieges and savage destruction, with plunderings that left the inhabitants barely able to recover from the utmost depths of misery.

As to new buildings—well, it must be admitted that a great part of the modern city is taken up with huge jute factories and model dwellings; but, at the same time, if the building and rebuilding of principal streets which has gone on since the middle of this century had been carried out with more discrimination, Dundee might have been very different architecturally.

The place is said to derive its origin, as well as its name, from having grown up round the old church of St. Mary, which, according to tradition, was erected as a thank offering (or *Donum Deo*) about the end of the twelfth century by David, Earl of Huntingdon and Garioch, favourite brother of King William the Lion, on his landing in safety after a severe storm on his return from the Holy Land, whither he, with five hundred followers, had accompanied Richard Cœur de Lion in the third crusade. But *Dun-taw*—Tay Hill—seems a more likely derivation, while a very reasonable doubt is cast on the traditional origin by the

fact that there seems to have been already a castle, or at least a fortified post, on the summit of the old Castle Rock, a precipitous eminence on the bank of the Firth, and further east than the old church; and, still more, if it is certain St. Mary's Church is meant, by the fact that the mediæval town did not extend further west than this rock; while the church was known even up to the seventeenth century as "the church in the field." The church, in one sense, may be said to exist yet, though whether any part even of the old steeple can be assigned to so early a date is more than doubtful; but the castle has disappeared, and a great part even of the rock has been cleared away in forming Castle-street. The stronghold was erected into a Royal residence by William the Lion, but was demolished about a century later, during the war of the Scottish Succession—tradition, of course, ascribes the act to Sir Wm. Wallace—to prevent its falling again into the hands of the English, who at that time twice took the town and sacked and burned it. It would seem, however, that Dundee was again in a prosperous condition in 1375, for it then paid the greater part of the ransom of 100,000 merks for the release of King David II.; and it is probably to about this period that the earlier work still to be seen in the "old steeple" may be assigned. The church of St. Mary the Virgin, of which the steeple was part, was burnt down in 1841, and the steeple has been refaced externally from bottom to top by Sir Gilbert Scott; but the interior of the ground story, which had a lofty arch opening into the nave, seems to point to two separate restorations—one in the fourteenth century which, above the plinth and bases, was more a rebuilding; and the second at about the end of that century, which dealt with the vaulting. The mouldings of the earlier work, and even the placing of the main

shafts, and the bond, or lack of bond, in places, are exceedingly clumsy, and look almost like the work of an amateur; while the lierne vaulting and short vaulting shafts of the upper part were obviously designed by a mason fully conversant with the traditions as well as the niceties of his craft. The latter work may have been executed after the siege in 1385, when the town was again almost reduced to ashes, but appearances justify the suspicion that some incompetent workman, having built up to the springing and succeeded even in turning the plain arch, found the vaulting beyond his powers and was obliged, when too late, to send for some one who understood his business. The expert, whoever he was, wisely ignoring what had been already done, formed his own vaulting shafts in the corners of the tower and sprung his vault from them. The old tower is a lofty and massive structure, and although Sir Gilbert Scott is responsible for every stone one sees, except in the main doorway, the quaint design and detail and the evidence of two old pinnacles preserved in the (former) ringing chamber are eloquent of the fact that he followed very closely such remains as he found of the original and probably had their authority for almost all he did. The parapet and set-off beneath the present belfry stage inevitably suggest that they once marked the summit of the tower; while the low saddle-backed erection which shows over the upper parapet, and is really the chief thing that gives the old steeple its marked character, is admittedly a late addition. This erection is called the "Cape House"—the word is, no doubt, connected with *caput*—and is said to have been at one time used as a prison. It was, however, more probably a watch-house; it is provided with a fireplace, the remains of a stone chest or cupboard, and loopholes closed by wooden



Dudhope Castle.

shutters on all sides. The tower was held against General Monk for three days in 1651 by the Governor of Dundee and a small garrison who, on their surrender, were barbarously massacred in the churchyard. The church, at some period between the Reformation and its destruction, had been divided into four by building up three of the arches at the crossing, and was used by four different congregations; and after the fire it was rebuilt, still in the old form externally, of nave, choir, and transepts, but as separate churches, called the town churches. The westernmost of these, nearest the steeple, is a mere barn-like structure without architectural pretension; and the others, though their windows are filled with elaborate flowing tracery, not ill designed as regards its main lines, and are provided with the usual trappings of Gothic architecture, cannot be considered as at all worthy appendages of the old tower.

The fine situation of the town, referred to in the Queen's "Journal of our Life in the Highlands," is well seen from the gallery surrounding the "Cape House." It lies on the north side of the Firth of Tay, and, like so many others, on the southern slope of a hill with the river at its foot. The town of Newport is opposite, at the mouth of a wooded valley between the hills, and the promontory, on which Broughty Ferry lies, close by on the east.

Until lately Dundee was shut in by the heights on the north, but it has crept round the west foot of "The Law," the principal eminence, to the village of Lochee, which is now included in the borough; encroached on its lower slopes, and even spread over the ridge on the east side of it. Some of the streets in these new quarters have rather steep gradients, but, as a rule, some skill has been used in laying them out to avoid this, and, although the result is much irregularity, that tends to a picturesqueness which is wanting in the individual buildings. Some indication of the rapid growth of the town may be gathered from the fact that in 1746, when it first began to recover from the effects of its latest disasters, famine and rebellion, the population was but 6,000, as against the 153,500, or thereabouts, of the present day; and a still better one, perhaps, from the description in Lewis's "Topographical Dictionary" (published in 1836) of the old Chapel-shade Burial Ground, now as nearly as may

be the geographical centre of the town, as being in its "vicinity."

In the churchyard are the remains of the old town cross, merely the much-decayed shaft of the cross itself, which, no doubt, once surmounted the usual octagonal shelter, with a small part remaining on one of its faces of the city arms. It originally stood opposite the old Tolbooth in the Seagate and afterwards in the High-street. The present cap and base, pedestal and crest are obviously modern. The only other architectural remains in Dundee that can, with some show of possibility, be supposed to have a mediæval origin are Dudhope Castle, the "Old Custom House," and the East Port, an old gateway at the east end of the Cowgate, in a rather unsavoury neighbourhood. It is but a low semi-circular archway in a rough stone wall with a plain roll on the outside and the jambs rebated, apparently for a gate, though no signs of hinges or fastenings remain, unless two recesses high up in the arch were for fixing the heads of cross-bars. Beside the arch on the north side is a loop-hole with a roomy recess on the inside, and this may have been repeated on the south side, but the wall is now pierced there for the footway and the loop-hole, if it existed, destroyed. The battlements are a restoration; they seem too thin to be any great protection, but the platform behind them is so narrow that the original ones can hardly have been more solid unless they were corbelled out on machicolations, for which there does not seem room between the crown of the arch and the platform. Each merlon has in the upper part of its face a tiny sinking of the shape of a key-hole upside down, like the outside of a small loophole for a crossbow, but the hole is not pierced through. There is no certain trace of any steps for access to the platform. The gateway was no doubt higher than at present, or rather the level of the roadway has risen. It is said, we do not know on what authority, that previous to 1548 the town was not enclosed within walls and that this, like the other gates, all now destroyed, merely formed a barrier at the end of the street, joining houses on either side. It owes its preservation less to any reverence for itself as a relic of antiquity than to respect for the memory of the heroic reformer Wishart, who preached from its summit in 1544 to the plague-stricken people assembled on the ground outside the town.

The remains of the Old Custom House, now scanty enough, look more like those of one of the strong palaces which succeeded the fortified castles of earlier times than anything mediæval. It was a large rectangular building, with a gable at each end and four circular turrets at the corners, and was certainly originally a residence, though used as the Custom House for about a century prior to the erection of the present one on the quay. An arcade, apparently purely decorative, ran round the base of the structure, the remains of which are now partly buried below the ground level. Its details are peculiar, but the arch mouldings and piers look more like a rough attempt to imitate classic details than anything else, and are very like those of a similar arcade on the inside of the west wall of the old burial ground called the Howff. Half the blocks, and one of the turrets of the other half are now gone; the other turret has been shorn off by carrying the sloping roof of the main block over it, and the arches are cut about and decayed. In all likelihood it was never a beautiful building; it has now been so crippled and defaced that it is painful to look at, and will probably soon disappear. The present general appearance of Dudhope Castle would justify the supposition that it also is a relic of the early sixteenth century only; but it is known to have been very much altered more than once and, supposing that among those alterations was the formation of all the existing windows, besides the razing of the main tower, and the addition of a story which are recorded, the core of the walls may be of almost any age. It is now adapted for use as barracks, a bare and not very interesting-looking structure, L-shaped in plan, standing in a gravelled barrack-yard. Its position, however, just at the foot of "The Law" and overlooking the town and firth, is magnificent; and surrounded by its original gardens and park it would probably seem beautiful. On each of the external angles is a round tower with a conical roof, and the entrance archway in the middle of the east side is flanked by two smaller semicircular ones. This is the part which is said to have formed a square tower or kind of keep, with a watch-house on the top; at present there is but a low gable, with a clock in it, and a small bell turret. The window-jambs and heads had a large roll moulding on them.

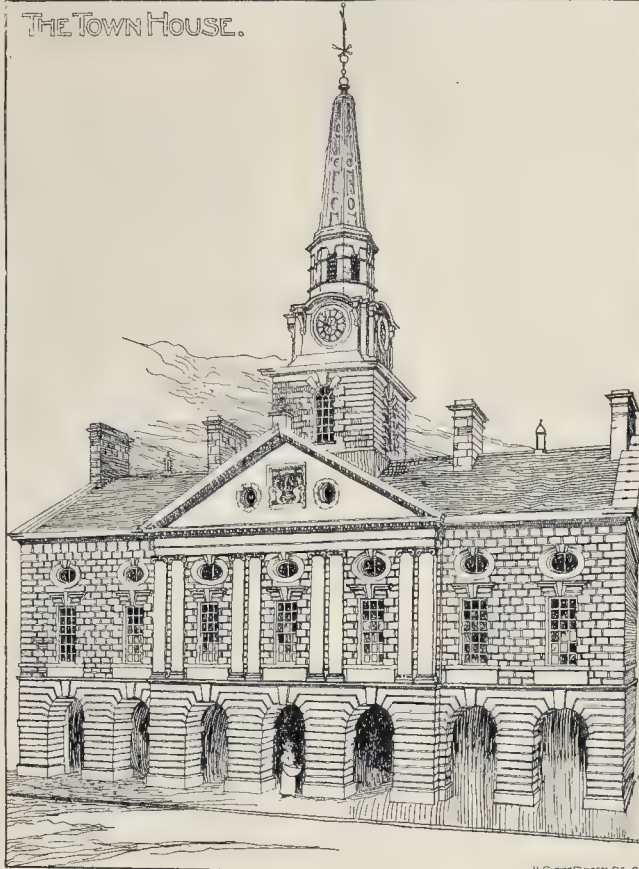




A COMMON FORM OF GRILLE

MORGAN'S  
TOWER  
NETHER  
GATE

THE TOWN HOUSE.



J. W. GORDON, F.R.S.

but this has been obliterated in many cases by the insertion of new stones with square arrises. Dudhope Castle is not properly a relic of the old town, from which it stood apart, but it was the seat of the Scrymseour, or Scrimgeour, family, hereditary Constables of Dundee and Standard-Bearers of Scotland, which became extinct in 1668, after which it was granted to Graham of Claverhouse, who fell at Killiecrankie, and then to the Douglasses.

Though mediæval architecture is scarce, modern improvements have not entirely effaced the Dundee of a rather later date, the relics of which are abundant enough in the back streets of the old quarter, and interesting as a whole if rarely so individually. The inhabitants of old Dundee lived in flats, even more universally than those of modern London ever will do, however far fashion may go in that direction. The flats were not luxurious; one, or at most two, rooms seems to have been the rule. But all the houses are of practically one type, a public passage from the street through the block to a staircase at the back which gave access to the upper floors, each of which was a separate tenement. The staircase was usually a winding one within a circular, octagonal, or, very rarely, square, turret projecting from the block of the building. The chimney stacks were generally built upon the front wall, in the middle of a gable, and flanked by the top story windows. These two features—the projecting staircase at the back and the chimney in the gable in front—are almost universal, and, it need hardly be said, have largely influenced the modern domestic architecture of the city. The

material of the walls is rubble stone in large pieces, usually squared, but with thick mortar joints, the largest blocks being used for quoins and window dressings, often roughly tooled; and the roofs are covered with thick, dark-coloured slates. One can hardly call such buildings beautiful or even picturesque, but they are decidedly more pleasing than those to which they have had to give way in some of the main streets, with their tawdry pattern-book ornaments and their pride of fine joints and carefully-rubbed surfaces. In a corner of a small open space, south-west of the Town House, are the restored remains of a residence of greater pretension. It is called Strathmartin's Lodging, and is said to have belonged to the barons of that name; but its present tenants belong to a much lower stratum of society. The house stands back behind a little forecourt, overshadowed on one side by a small projecting building with a rather quaint gable. Its main feature is a large, projecting octagonal stair turret—in this instance in front—with an ogee slated roof and an elliptical-headed entrance doorway, flanked by rusticated Ionic columns, and surmounted by an entablature and carved pediment, over which are three small niches in the wall with rough stones projecting in the form of canopies, and evidently once containing little figures. There is a little thing almost opposite to this house—whether old or not, or, if so, how old one cannot guess, and it does not much matter, but which most architects will notice—namely, an effective iron window grille, the alternate bars of which are merely old wheel tyres deeply jagged, an example of a good result obtained

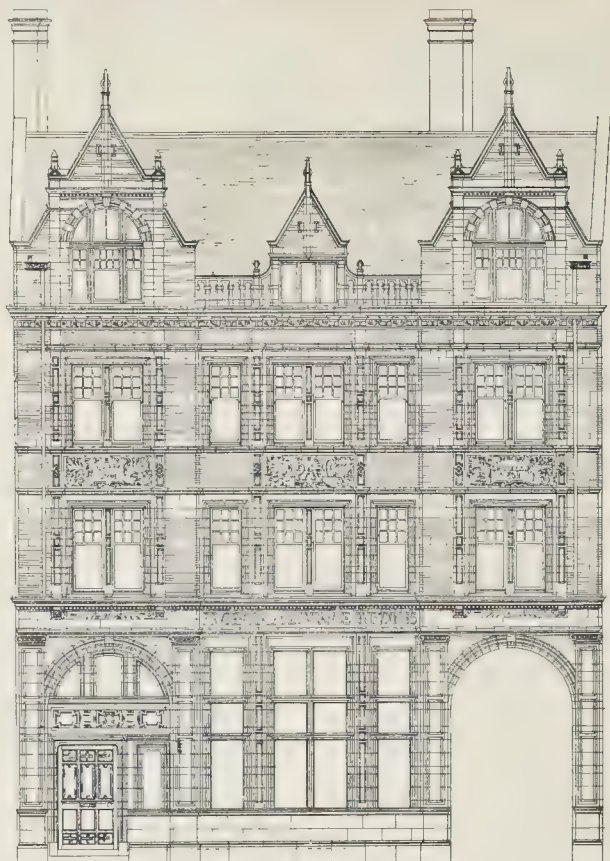
with the very simplest means. The building called Morgan's Castle, in the Nethergate, was, no doubt, once part of another residence of a superior kind, but of one which stood without the town in its own grounds. All that remains is a large round tower partly projecting over the footway, covered with a sharply-pointed ogee-shaped slated roof with flush eaves; it is five stories high, lighted by three-light windows, which may or may not be insertions of a later date than the walls. It is a picturesque object, but its history does not seem to be known. The whitewashed remains of a characteristic little round turret at the corner of the High-street and the Overgate is said to mark what was once another building of the better class; a house where the parents of the celebrated Anne, Duchess of Buccleugh and Monmouth, lived when they were driven from the Castle of Dalkeith by Cromwell's Commissioners, and where she was born; where also Monk resided after he had reduced the town; but the turret is well nigh all that remains of it.

Of much greater architectural interest is the Town House and Tolbooth, standing in what is here called the High-street, though in England we should probably call it the market-place. It was erected in 1734, according to an inscription in the pediment, and is a characteristic eighteenth century building by the elder Adam, having rather small parts and carefully studied details with a marked trend towards the elegant but rather emasculate delicacy developed in the work of his sons. The oval lights in the wings (see above) are shams, and the whole front is much spoiled by a thick coating of paint. The lofty stone turret and



spire are carried on the walls of the circular main staircase, which is built round a hollow newel and is a delightful piece of mediævalism to be found within such a shell. It gives access to a vaulted corridor on the first floor, at one end of which is the Guildhall and the other the council chamber, good rooms with panelled walls, deeply coved ceilings, and characteristic chimney pieces and door heads. The portraits of Scottish kings and Dundee worthies in modern stained glass that fill the windows are very good pieces of work, especially those in the Guildhall, which are, moreover, more in keeping with the architecture than those in the Council Chamber. The ground floor is occupied by an open arcade and shops, and the attics and basement by the prisoners' cells, now mostly used as munition rooms. The iron gate of the condemned cell is worthy of praise as a specimen of skilful and laborious forging. The old Trades House, erected in 1770 by the nine incorporated trade guilds at about the spot where the Clydesdale Bank now stands, but pulled down when the Murray-gate was widened, seems, from the drawings of it hung in the Albert Institute galleries, to have been built to some extent in imitation, whether conscious or not, of the Town House; but the order had three-quarter single columns instead of coupled pilasters, and the centre feature was a lantern, probably of wood, surmounting a dome which rose oddly through the roof without any drum.

The Clydesdale Bank, by the late Mr. Spence, of Glasgow, which stands on a triangular site between the Murray-gate and Sea-gate, facing the end of High-street, is the most important and ornate new building in this part of the town; the large Corinthian pilaster order and deeply-carved frieze give the design a good deal of dignity and richness, but it is more careful and conscientious than interesting. The building is only two stories high, and, being on the slope of the hill, looks rather in a hole. It is not likely that the extra story which some local critics would like to see added to it would help very much, but the feeling that the structure is too low for its position is perfectly justified. Nearly opposite the bank, at the corner of Castle-street, a large new building is in course of erection, which promises to be a very excellent piece of architecture. The walls are only up to the level of the second floor, but the detail so far is extremely good; and if one may judge of the whole design by the rusticated basement, the large mullioned windows, and the commencement of a sturdy pilaster order, it should be a great success. In Reform-street, which runs northward from the High-street, opposite the Town House, the experiment has been made of treating the whole side of the street as one design, an experiment which has so often been unsuccessful that it seems almost foredoomed to failure—at any rate, in Great Britain—and even some foreign examples are not encouraging. Such a result is as curious as it is disappointing; theoretically, nothing should tend so much to breadth and grandeur; yet, to speak of breadth and grandeur in connection, say, with Regent-street or the Rue de Rivoli, would be absurd. And the late Mr. Burn, who designed Reform-street, was no more successful; the elegance and refinement of his details bear witness that he was a learned architect, and one cannot see that he neglected any opportunities for grouping, nor that the plainness of the work, which, no doubt, was enforced, or the present dirtiness and shabbiness of the fronts, make a great deal of difference; yet the result is simply dull, uninteresting monotony in which the better qualities one might expect are sunk and overwhelmed. The design is broken on the west side by the junction with Bank-street, at the corner of which is the branch office of the Bank of Scotland, the alterations to which were carried out by Mr. G. S. Aitken. It is a very passable



Prudential Assurance Buildings. (Messrs. Waterhouse & Son.)

piece of modern Renaissance work with a fancifully rusticated ground story and balconies, and pediments to the first-floor windows; it looks quite rich beside the severe simplicity of the rest of the street. The Kinnaird Concert Hall in Bank-street, by Mr. Charles Edward, has a plain but satisfactory two-storied front, with a pediment to the middle block. The patent office, next door, is tall, narrow, and ugly. A great part of the north side of the street is occupied by the offices of the *Dundee Advertiser* and other papers under the same able management; dignified, business-like buildings by Messrs. C. & L. Ower, of Dundee, neither too ornate nor excessively plain, and respectably, if not very interestingly, detailed. Reform-street ends in the open space called Meadowside, in and round which is grouped some of the most interesting architecture in Dundee, with the Albert Institute in the middle and the handsome old High School on the rise of the hill to the north.

The High School was designed by the late John Angus and built in 1833, when architects devoted their attention to the massing and general proportions of their work, and were content to borrow the best details they could find in a meek spirit of thankfulness and humble assurance that they could invent nothing so good. It was a poor-spirited attitude, with which we of the present day have no sympathy; but a comparison of the large, quiet simplicity and the breadth and refinement of such compositions as this, with the finicking fussiness of most more modern works, or the affected baldness

and coarseness which seems the vogue of the present moment, always suggests the question, "How long will it be before our system enables us to produce a building that will approach this imitative architecture in impressiveness and grandeur?" Sir Gilbert Scott's Albert Institute is also, though in a less complete sense, imitative; and, although it suffers by a comparison with the High School, which their proximity renders unavoidable, it also has an attractiveness of its own, which perhaps would be greater if it had the advantages of size and situation possessed by the latter. It is not, however, one of Scott's most successful works; a certain degree of failure seems to be inseparable from attempts to fit mediæval ecclesiastical architecture to modern civil requirements; but it has picturesque and piquancy, and gives that satisfaction which every architect feels with work carried out with obvious care, sympathy, and knowledge. Like the Clydesdale Bank, it suffers a good deal from want of height, being on a comparatively low site. The main block consists of a large hall, now used as a free public reading-room, built over a low story of offices, and approached by an imposing and picturesque external flight of steps, leading up to a rather weak porch at the first-floor level, which has the unfortunate effect of making the building look even lower than it is. The style is Early Gothic, with rather heavy buttresses, which at the angles carry little round turrets. The ends have stepped gables with circular windows in them, and the centre of the roof is surmounted





by a beautifully designed lead flèche surrounded by small female figures and running up to a sharp spire. The north side of the original building is less symmetrical than the front, but the large low octagonal tower behind the hall, with its circular roof, must have produced a very picturesque grouping before the rather muddled mass of buildings, with its ugly skylights, was added on the east. Most of the details of this addition are conscientiously copied from the original, but the angle turrets have been thinned and spoiled, and there are two smaller flèches which quarrel with the original one, and some absurd spreading finials. Notwithstanding their faults, however, it cannot be said that the additions are out of keeping with, or altogether unworthy of, the original, and Mr. Alexander, the city architect, is to be congratulated on not having failed to a far greater extent in a difficult task. The interior of the large reading-room has a wooden barrel vault rising from a heavy stone cornice and carried on carved principals. The east addition is used as a museum and picture gallery, and contains collections of casts, natural history specimens, jute products and curiosities, and a small number of pictures. The most interesting curiosity is the remains of an ancient "dug-out" canoe found in the sand on the banks of the Tay. In front of the main entrance to the Institute is a well-designed stone fountain, with black and red polished granite introduced; the details are more French than English, but they are well executed, and the wet surface of the dark stone sparkles in harmony with the polished granite, so that together they make a very pleasant mingling of colours. There are three statues also in the ground round the building, none of which are remarkable, while the strained, uncomfortable attitude of one of them, that representing Burns, is rather painful to look at. In the rich front of the Eastern Club, facing the south side of the Institute, its architects, Messrs. Pilkington & Bell, of Edinburgh, in trying to design up to its name, have attempted to obtain an oriental aspect by modifications of Renaissance detail in the direction of the outlandish and grotesque, and by executing the carving in a sort of pseudo-Romanesque. The Prudential Assurance offices, by Messrs. A. Waterhouse & Son, are at the east end of the square, and bear the date 1896. Their front is chiefly built of the dull red bricks that seem inevitable, even in towns where stone is the usual and natural material, with a red stone ground story, and bands, and dressings. The design is quiet and pleasing, with panelled pilaster strips flanking the windows, a good cornice,

gables to the side bays, and a small dormer between them. The Caledonian Insurance office, next door, has a large gable surmounting two bay windows with quadrant corners, and connected at the top by a balcony with a lace-like pierced parapet. Facing the north side of the Institute is the Exchange or Merchants' House, designed by the late D. Bryce of Edinburgh, and finished in 1856; another modern Gothic hall, built over a floor of offices and also used as a reading-room, though by subscribers only. The external design is unusual, consisting of a series of square-headed mullioned windows, very high in proportion to their width, flanked by projecting banded shafts borne on corbels, and supporting very large grotesque gargoyles, which serve to carry the vertical lines through the cornice, and connect them with the piers and buttresses of elaborate traceried dormer windows. The heavy tower at the corner, which was to have been finished with a crown on the summit, similar to the one at Oudenarde, has been left incomplete owing to the insecurity of the foundations. The roof of the great hall is somewhat elaborate, and the dormers are filled with good stained glass. Adjoining this building on the west is the Merchants' Shelter, or the Exchange proper, where the merchants are supposed to meet; it is internally merely a long, low, rather bare room with seats against the walls and is usually unoccupied, the merchants preferring apparently to do business at their offices, or standing about in the High-street in front of the Town House. The street front is a very neat, quiet little composition with plain, well-proportioned mullioned windows and a traceried parapet broken by three gables over the doors. Next to this again, at the corner opposite the High School, is a Congregational Church, a small building of rather squat proportions with a wheel window in the main gable and low octagonal flanking turrets. The only other building of any note in the square is the old Post Office, a respectable little bit of old-fashioned Renaissance architecture, not very interesting nor very beautiful, but quiet, correct, and inoffensive.

Very different is the now nearly complete, imposing, and elaborate new Post Office at the corner of Ward-road and Constitution-road, by Mr. W. Robertson, of the Board of Works in Edinburgh, with its multiplication of detail, its columns and pilasters, strings and cornices, square windows and circular-headed windows, dormers, domes, turrets and vases, carving and sculpture, and many other contents of the architectural larder poured into the pot and flavoured with just enough Italian Renaissance sauce to satisfy the public palate. The new red stone

Baptist Church, a little further along Ward-road, is a more satisfactory design, though the front to the street is little more than one broad two-storied bay window, projecting in very flat lines, under a plain gable. Next to it are the plain but architecturally satisfactory offices of the Dundee Water Commission; the long, low front built in grey stone, with red stone dressings, and broken by three symmetrically-disposed gables, under each of which is an oriel window. Beyond this again is what appears to be a gymnasium, the front of which has high roofs and details of the François I. style, and is surmounted by a little turret bearing a figure, apparently of Fame; it is admirably grouped, but somewhat weak in its details. The Wesleyan Church opposite, and the Baptist Church up the side street are buildings of no great pretension with Early Gothic details. In Court House-square is the now abandoned industrial school, a plain building with rather sharply-pointed gables and a small tower. The Court House, facing the top of the square, is after the High School, to which it bears a strong resemblance in its grouping, the most imposing and dignified building in the town. It was designed by the late W. Scott, of Dundee, and has a long front with a large centre block, connected to smaller end ones by what are really screens, pierced with gateways and masking the irregular buildings of the prison in the rear. The middle and end blocks are treated with a sturdy Tuscan pilaster order running through the two stories and mounted on a high base; the screens with capless piers and a frieze and cornice. In the middle of the centre block there is a projecting pedimented portico of four columns, reached by flights of steps. The stable and solid appearance of the building is somewhat marred by the fact that the upper windows have arched heads. Nothing is to be seen of the prison in the rear of the Court House beyond the high blank wall in the Lochec-road. The front of the Curr Night Refuge in Bell-street is a not very satisfactory composition of four stories, the top one being lighted by oval windows in round-headed dormers surmounting a weak cornice. The principal ornamental feature is the projecting doorway flanked by little piers and columns supporting an arch under a cornice and pediment. In the tympanum of the arch is a bas-relief representing children welcomed at the institution. Beyond this, at the corner of Constitution-road, are three churches, of which the newest, the U.P. Church on the west side, though not at all ecclesiastical looking and very plain, is a pleasing piece of work. It is a simple rectangular block with slightly projecting angle pavilions, treated with a rusticated ground story and shallow piers with small caps and bases carrying an entablature with a sufficient cornice and a balustrade broken by a sort of attic in the middle of each front. The Girls' School, facing the west end of the old High School (Mr. Fairley, of Dundee) is an important new building, but remarkably weak and thin looking considering the pains which have evidently been taken to make it effective. The two, almost equal, fronts are broken up by scarcely visible projections of only four or five inches, and the cornice is only of about the same depth as the string at the first floor level; indeed, all the features and projections, reveals, and so on, are small and nearly of a size; so that there is no depth and no emphasis anywhere except in the doorway, which is set back behind a couple of small columns just enough to give a little shadow. Behind the High School, in Bell-street, is a very neat, if not elaborate, new red stone block of offices and shops; and turning down into Meadow-side again, just behind the Exchange, one comes to the very ornate and rather fantastic, unfinished Pearl Insurance Buildings, by Messrs. C. & L. Ower, also in red stone, the front broken up at the top by two much crocketed dormers of different sizes and a tower with heavy angle pinnacles. In Pan-



mure-street, close by, there is the block of offices occupied by the North British Mercantile Insurance and National Telephone Companies, which possesses some architectural importance in virtue of a large cornice and an order of three-quarter Corinthian columns.

Commercial-street, which runs south from Meadows, might be quoted as another example of an attempt to treat a street as one complete architectural design, if there were really any design in it. It is, however, only so many yards of pattern-book architecture, a mere medley of tawdry ornaments, the sort of thing that might be expected from one of the gentlemen who build rows of twenty pound houses in the suburbs if he had to deal with an important street in the middle of a town. We understand that the Burgh Engineer is responsible for the design of this and Whitehall-street, which is very similar. If that is so, every one capable of judging architectural design must regret that a man who is probably exceptionally capable (he would hardly be Burgh Engineer of Dundee if he were not) should have committed such an error of judgment as to attempt work for which his training and experience obviously had not fitted him; it is heartbreaking to see two of the principal streets of a great city reduced to such a vulgar level. At the first turning on the left in passing down Commercial-street is the Murraygate, in which the only building worthy of note is the British Linen Company's Bank, we believe by Messrs. Peddie & Kinnear, a simple composition with a good crowning cornice, and in which some interest has been obtained by spacing the windows carefully and emphasising the middle one. On the other side, just beyond the Clydesdale Bank, and really in the Seagate, though best seen from Commercial-street, is Sir Gilbert Scott's St. Paul's Episcopal Church, one of the only two really good examples of modern Gothic in Dundee. The interior consists of a nave of five bays with lofty arcades and aisles and no clearstory, transepts, a short choir with an apsidal end, and a spacious vaulted porch under the tower. The nave, aisles, and transepts have open trussed rafter roofs, but the choir is vaulted in stone. There is one fairly good stained-glass window, a number of very bad ones, and a stone reredos with a large mosaic picture in it. The church stands well, on a part of the old castle rock, twenty-six steps above the street level, but is much built in. Its great feature externally is the fine steeple, consisting of a simple broach spire with small pinnacles at the foot rising from behind the traceried parapet of a large and lofty tower. The tower has a set-off and second parapet below the belfry windows, an arrangement evidently suggested by the old steeple in the Nethergate; and it has also a somewhat similar stair-turret and short buttresses; the mouldings, crockets, and other carved ornaments are, however, much more normal and less interesting and picturesque than those of the old tower. The aisle windows run up into sharply pointed gables, which break the line of the roof, an arrangement the beauty of which is always questionable; they are, however, of fine lofty proportions, and filled with well-designed Decorated tracery. The plain, rather coarse, two-storied building beside the church, with shops under it, is no doubt the church school, but is not at all worthy, architecturally, to have any connexion with Sir Gilbert Scott's work. To the left, a little way down the Seagate, is the theatre, by Mr. W. Alexander, of Dundee. Its front is a good ordinary piece of work in the style of a Florentine palace, the pleasantest features being plenty of wall space over the upper windows and a good cornice; more care, however, might have been bestowed with advantage on the balcony over the entrance and the consoles that support it. Nearly opposite is a large unfinished building in red stone by Messrs. Johnson & Baxter, very plain for the most part, but



St. Paul's Church. (Messrs. C. & L. Over.)

broken up in front by two pairs of false turrets, carried on corbels and flanking two gables; the spaces between are finished with a cornice and crenellated parapet, and a large dormer forms the middle feature. There is little else to notice in the Seagate, except a pretty old wrought-iron lamp holder over the gateway to the courtyard of some little old houses. Commercial-street ends in Dock-street and the quays, at the point where the old Exchange, now the City Assembly Rooms, is situated. This is a quiet old-fashioned building with an accurately-proportioned Grecian Ionic order of ante to the upper floor. The principal front, to the west, facing the open space called Shore-terrace, has importance given to it by planting columns in front of the ante at either end and breaking the entablature forward over them. The interest of this quarter of the town centres in the so-called Royal Arch, which stands at the end of the quay between two of the docks and was erected in memory of the Queen's visit to Dundee in 1844, from the design of the late Mr. Rockhead, of Edinburgh. It would be one of the easiest things in the world to ridicule it. As a serious work it is an absurdity, bad in design and detail, and not at all a worthy memorial of an historic event; but as a piece of mere scenery it is, as the local guide-book quite happily puts it, "rather imposing." It is, perhaps, necessary to mention that it is a solid stone structure, and not merely painted wood and stucco as one is apt to gather from an illustration of it. What makes it imposing is probably partly its size, exaggerated as this is by its standing alone, and partly the richness imparted to it by its interlacing arcades and chevron mouldings. It is really a great pity that the detail is not better carried out; the orders of mouldings in the large arches are too small; the depth under the arcades is too little; the string-courses are too thin, and all the coping and cornice mouldings resemble those of the fifteenth rather than those of the twelfth century; and what is perhaps as regrettable as anything is that the stones have smooth rubbed surfaces and very fine joints, a treatment that, more than anything, gives an unreal appearance to what professes to recall the rough work of the Normans. There are upon the arch, however, two admirably designed and beautifully carved coats of arms, the Royal arms on one side, and those of the city on the other. In East Dock-street the most important building is the Custom House, a satisfactory composition, if not very original, carefully thought out and well detailed. The ground story is rusticated, the upper part has a portico of four Ionic columns in the middle, the windows on each side are carefully grouped, with the centre one marked by richer treatment, and there is a good strong cornice to crown the whole, with a pediment over the portico. Of less important structures near it there are the little Sailors' Reading-room which is picturesque; the Maritime-buildings, opposite the Arbroath Railway Station, by Messrs. James Maclaren & Son, which though weak and thin in their details are fairly satisfactory; the Sailors' Home, by Messrs. Ireland & Maclaren, a





Technical Institute. (Mr. J. Murray Robertson.)

lofty and very ornate edifice; and a little two-story office building of good general character further west. There are some rather startling new shop premises in Crichton-street, built of red brick with a mingling of yellow and blue; the bracketed-out wooden cornice at the second floor level, the arches above it with round wooden bay windows in them, the large cornice and curved gable make an over-busy composition but the touch of bright colour in the monotonous grey of the street is pleasant. The effective main front of the Gillfillan Memorial Church, designed by Mr. Malcolm Stark, of Glasgow, faces the bottom of Whitehall-street; the projecting central part has a rusticated ground story in which the entrance is set within a bold arched recess, and a large semi-circular-headed window to the upper floor; the wings have shop-fronts on the ground story and windows similar to those of the town house above; the whole is crowned by an entablature and cornice carried by shallow Ionic pilasters and broken by an ogee pediment, too high in proportion, over the centre. There is a well-designed wooden turret on the roof, flanked by pinnacles which serve to carry up the main lines of the building. The Caledonian Railway Station, by Mr. Thos. Barr, C.E., of Perth, represents an unsuccessful effort in the so-called Scottish Baronial style, and has stepped gables and a heavy clock tower. Returning from this point to the High-street one passes, in Union-street, the remains of what seems to have been a good house front in the Adams style.

The architecture of the Nethergate west of the old steeple is not very interesting. St. Paul's Free Church, St. Enoch's Established Church, by Messrs. Edwards & Robertson, and the Roman Catholic Pro-Cathedral are all Gothic Revival buildings, the first and last of the kind known as "churchwarden" Gothic; St. Enoch's is rather later in date and rather better in detail, but of no great merit. The Queen's Hotel, by Messrs. Young & Meldrum, is also as Gothic as pointed arches to the windows, recessed jambs with little columns in them, and

wooden barge-boards to the dormers can make it. A block of shops in red stone next to St. Enoch's Church is rather less unsatisfactory, but the lines of the gables are weak, and the piercing of the balcony fronts is too small and lace-like to tell when seen from the street level. Not long ago the region about the end of the Nethergate was the chief residential quarter, and there are still a few little old houses remaining with old iron railings in front that look very reposeful. In Smalls Wynd, at the beginning of the Perth-road, is the New Technical Institute, by Mr. J. Murray Robertson; it is a plain rectangular, business-like structure, with a small cornice and central pediment, the windows concentrated in three groups and the lower ones connected with the upper by panels filled, in the middle group by carving, and in the others by strap-work which is much too small in scale. The best bit of detail about the building is the pretty light iron railing in front of it. In the Perth-road are several modern Gothic churches which force themselves upon one's attention. St. John's Free Church, by Mr. James Hutton, has a lofty tower and spire; St. Mark's Established Church, by Messrs. Pilkington & Bell, has many gables, much rich carving, and also a spire; the Rye Hill U. P. Church, by Mr. G. S. Aitken, is in a round arched style and has a tower surmounted by a dome and lantern; and the Cheyne Memorial Church is very similar to St. Mark's, and by the same architects. St. Peter's Free Church, in one of the side streets, though in itself a very plain barn-like edifice, has an old tower which is not altogether without interest. On the south side of the Perth-road, in Magdalen Yard-road, opposite the end of Greenfield-place, there is a simple little one-story house that has apparently seen better days, but is still charming; it is carefully designed, with projecting wings and a little central wooden porch overlooked by a broad dormer. And at the bottom of the same street, opposite Magdalen-green and the Tay Bridge, there is an exceedingly pretty villa of the Greek revival period standing in an equally pretty garden, and looking very com-

fortable as well as being a scholarly little piece of architecture. The district north of the Perth-road, as far as the Lochee-road is a manufacturing quarter which does not boast of many buildings of architectural character. But we may mention the Hawkhill Schools by Mr. James Langlands, a structure of the lofty, square, solid, and useful-looking form favoured in Scotland for public elementary schools; a small but pleasing modern Gothic church in Blinshall-street; a small factory in the lower part of Blackness-road; and the Logie Church Hall in Scott-street. In the Lochee-road there is a new factory at the corner of Douglas-street, which deserves to be mentioned as something better than average factory architecture, and the Dudhope Free Church, a rather curious but not displeasing composition in round arched Gothic, with the principal windows set back behind a plane of tracery which would be more effective if fuller. The new church in reddish stone at the corner of Union-place, almost in Lochee, is perhaps a rather better specimen of modern Gothic work than most of those in the town, but cannot be considered quite successful. The library and baths, by Mr. J. Murray Robertson, in Lochee itself is, however, one of the most satisfactory new buildings we have noticed. It is small, and by no means ornate, but its sobriety and restraint contrasts pleasantly with the ambitious fussiness that often characterises buildings of the sort, and such detail and ornament as there is is good. Close to this is St. Mary's Catholic Church, by Mr. Goldie, which has a remarkable and effective east end, consisting of an octagonal building of chapter house form with very high windows.

The most important building between the Lochee-road and Constitution-road not yet noticed is the Royal Infirmary, designed by Messrs. Coe & Godwin. It stands in a commanding position on the slope of the Lawhill, overlooking the town and Firth, and is a clever and impressive, if not particularly beautiful structure. Its long front is broken by a massive-looking square block in the middle, flanked by well-proportioned turrets, and by gabled projections in the wings. The



material of the walls is a rich red stone, with white dressings and parapets, and the style followed is very Late Gothic, with mulioned and transomed windows. Except in the matter of the high-pitched gables, the style is very well carried out, though there is little moulding or ornament except in the main block, which is rather rich, especially as regards the doorway, with the flight of steps up to it and the oriel over. In this part all the principal windows have cusped heads and a little tracery in them. The style of the new detached buildings behind the principal one is imitated from it to a considerable extent, but it is instructive to notice how the good architectural character has been eliminated by superficially unimportant changes. In Dudhope-crescent, nearer the middle of the town, are some minor buildings that may be mentioned. The Catholic Apostolic Church at the corner is detailed with some little skill in the Early English style, and has a very pretty flèche; and further down are a United Presbyterian church, and a neat little office front on the other side. Towards the bottom of Constitution-road are the savings bank, which may be described as a Renaissance composition dressed up in Late Gothic details, and the Young Men's Christian Association building, which would be satisfactory but for its large grotesque dormer with its square dome. In the lower part of Hilltown, St. James' Church, with its high gable and rich turret, makes a picturesque group; and the Church of St. Salvador in Church-street, Main-street, by Mr. Bodley, is the second of the two really good examples of modern Gothic work in Dundee, which we referred to in speaking of St. Paul's Episcopal Church. It is a far less important edifice and comparatively plain, but the Decorated detail both of the mouldings and tracery is what might be expected, and the plan of the building, with a narthex and the aisles constructed in the thickness of the buttresses, shows its architect's well-known knowledge and skill. In Victoria-road the Victoria Calendering Company's works may be noticed as well as the Trinity C.U. Church; and in Victoria-street the U.P. Church and the Wallacetown Parish Church; the latter in round-arched Gothic style, with a large square tower, the belfry of which seems to be a recent rebuilding, and is far from being an improvement.

The "Morgan Hospital" (Messrs. Peddie & Kinnear)—really a charity school—is the principal public building in the north-west part of the town, and an extravagantly enriched piece of work considering its purpose. The "Scottish Baronial" style has, no doubt, inspired the architecture generally, but it can hardly have given any excuse for a good deal of the rather tawdry ornament. It is a building of two stories, with a massive tower in the middle of the main front, against which two stepped gables crowd up in an affectionate but undignified way. The chimneys in the other gables are a curious survival of an old Dundee feature referred to on a previous page. The new Roman Catholic Church in Albert-street, by Mr. T. M. Cappon, now approaching completion, is a work of a different stamp, and will be an ornament to the town and a third example of good Modern Gothic. It is built of coursed rubble, with ashlar quoins and dressings, all of a red colour, and consists of a nave with a small shallow transept, small sanctuary, two low, shallow chapels on each side, and a tower with a quaint and picturesque belfry stage. The proportion and details throughout are excellent. The Baxter Park Free Church in the Arbroath-road, by Mr. A. Johnson, is not so good; but it has a well-proportioned tower and spire, and, except as regards the tracery of the great rose window, which is too thin, and the cusping in the heads or the buttresses, the detail is adequate. Nearer to the centre of the town there is the old church of St. Andrew at the west end of King-street, built, according to the inscription on it, in 1773, and designed by the

elder Adam; it is rather a barn-like structure, but its steeple is interesting and characteristic of the period, and it gains a good deal of dignity by the terrace and the flight of steps and broad walk from the old iron gates and handsome gate piers. Not far from it is the Cowgate Board school, a very similar building to several public schools already described. A little further east there are two or three very large factory buildings, which size, and especially height, make impressive. One in St. Roque's-lane is especially so; it stands on rising ground and has seven lofty stories, and the gable end flanked by square towers, one of them surmounted by a wooden-domed bell turret (which is a conspicuous object from many parts of Dundee), looks really majestic.

Dundee has three parks, and an esplanade which reaches from the Tay Bridge to the docks, which is the popular promenade. Balgay Hill Park is on the west, Barrack Park on the north side, and Baxter Park on the east. The last-named is extensive and has been beautifully laid out, it is said, by Sir Joseph Paxton. Its Elizabethan entrance lodges and gate piers, and the classic pavilion in it, are also exceedingly good examples of their respective classes. The only open spaces really within the town are the two old cemeteries, the Howff and the Chapelshade burial ground, both of which are laid out with walks and provided with seats. The former is said to derive its name from having been used for many years as the howff, or meeting place, of the trade guilds, each of which used to assemble round some particular monument in the cemetery in the days before the erection of the Trades' Hall. It was given to the town as a burial place by Mary, Queen of Scots, and is said to have been before that the site of a Franciscan Convent, one of the three monastic institutions of Dundee, of none of which is much recorded beyond the fact that they existed.\*

#### NOTES.

M. Charles  
Garnier.

The death of M. Charles Garnier, which is chronicled under our obituary heading on another page, removes from the architectural world one who was not only an eminent architect but a very characteristic and original personality. Among the eminent French architects of the day he in some respects stood alone. Though a pupil of the École des Beaux-Arts, and a "Prix de Rome" man, his work showed none of the merely scholastic or academic tendencies which that academical education has rather tended to impress even on architects of genius. His great work, the Paris Opera House, though what may be called a classical building, is an architectural conception of remarkable freedom and originality both in general design and in detail. If, however, his native vigour and originality enabled him to escape the vices incident to academical training, he also fell short of some of its virtues. He was a curious contrast to such a typical scholastic architect as Baltard, whom (as noted in our obituary record) he succeeded at the Académie des Beaux Arts. Baltard represented the old school of severity and refinement of design. Garnier represented nothing but himself; and, with all his originality, he would have been the better for a little more of the traditional severity of French classical training. The want of reserve, the too great *bravura* of style, is the defect of the Opera House, and this characteristic is still more

marked in the Monte Carlo Casino, which has a great deal more of the Casino style about it than one would have expected from so eminent an architect. But in fact Garnier was essentially one of the "one-building" French architects. Just as Duc is remembered by the Palais de Justice, he will be remembered by the Opera House, which, in spite of its over-exuberance, is one of the most remarkable works of modern architecture, and happily illustrates the saying, "le Style, c'est l'Homme." For it was just this exuberance of spirits, of activity, of general character, which marked the man as well as his work. Though a Parisian born, there was a southern vivacity about his whole personality and character. His versatility was amusingly shown in the lively little comedy which he wrote for the after-dinner entertainment, some years ago, of the International Congress of Architects at Paris; it was equally shown in his ubiquitous work on committees of all kinds, for after his fame was made he became a kind of general artistic adviser both to the Government and to the municipality of Paris, and few artistic schemes were undertaken without his advice and concurrence. This, no doubt, was as creditable to the French officials as to himself. The French Government know how to appreciate their eminent architects, and the death of Garnier will no doubt be felt to have left a serious void in their Councils and Committees.

The House of Commons have passed a vote to complete the sum of 5,927*l.* for the Wallace Gallery, hitherto known as Hertford House, Manchester-square. No rent will be paid for the premises, of which the estimated cost for maintenance during the present year is 300*l.* The estimated cost of the building, including the extensive alterations now in progress, is 109,000*l.* Of that aggregate a sum of 80,000*l.* was voted last year, and another sum of 25,000*l.* the current year, leaving 4,000*l.* to be provided hereafter. The house was built by Sir Richard Wallace, Bart. (obit 1890), for the fine-art collections gathered by him and the fourth Marquis of Hertford (who died, unmarried, in 1870), on the site of Manchester House, erected in 1776-83 for George, fourth Duke of Manchester. On the Duke's death the house became the residence of the Spanish Ambassador, who built the adjacent Roman Catholic Chapel in Spanish-place, and then of the second Marquis of Hertford being, it is believed, the original of the Gaunt House of "Vanity Fair." The third Marquis was also a well-known collector, his successor bequeathed nearly everything to Sir Richard Wallace, who in turn made Lady Wallace his sole legatee, their only child, a son, having died in 1887. Lady Wallace died in February, 1897.

In order to celebrate the centenary of the discovery of the primary battery by Alessandro Volta, an international electrical exhibition will be held in his native city of Como next year. As Volta was not only the first discoverer of "voltaic" or current electricity, but also developed the theory of it along purely physical lines, he can be regarded as the

\* This series of illustrated articles was begun in our issue of September 26, 1896. A list of those towns already dealt with, and particulars of future arrangements, will be found on page 154*il*.

\* Rebuilt after the designs of Messrs. Goldie, Child, & Goldie. See two views of the interior, in the *Builder*, October 12, 1895.



founder of the modern science of electricity. The exhibition will be historical in character, and will review the progress made in the science during this century; but in addition all the latest developments of industrial electricity will be shown, and a special feature will be made of electrically-driven machines and tools employed in the Como silk industry. It will open on May 15, 1899, and will last for five months. Manufacturers of every kind of electrical apparatus are invited to exhibit. As Volta is one of the scientific worthies whom every one delights to honour, and as Como is beautifully situated on the lake which bears its name, this exhibition will, doubtless, attract people, especially physicists and engineers, from all parts of the world.

FROM reports in various local papers in regard to the salaries of Medical Officers of Health, we are inclined to think that these officials are very often much underpaid. We are not surprised at this, since many Local Authorities would be content to do next to nothing in regard to sanitary matters if it were not from the pressure of the Local Government Board. Some of these local bodies, therefore, practically pay their medical officers what is a merely nominal salary. It is not to be expected that really good work will be done by men who are underpaid. We have no doubt that in many districts, if medical officers were better paid, there would be a much higher level of sanitation. It is also a matter of some doubt, however, whether it is desirable for Medical Officers of Health to be general practitioners in their district. Probably the work would be done much more independently if a medical officer always had a considerable area under his jurisdiction and did not take private practice at all.

FOR many years a brick made chiefly of pumice in small pieces cemented together has been in use in that part of Germany bordering the Rhine, and we now notice that it has found its way to England. The pumice is the product of some ancient Tertiary volcanoes situated for the most part near Andernach and the Laacher See. The sections as seen in the various pits show the pumice to be in pieces varying in size from mere grains to lumps some 4 in. across. It occurs in layers, but is frequently interrupted by small lenticular patches of more solid fragments of lava. The bricks are made from screened pumice, the larger pieces being broken to pass through a sieve having about  $\frac{1}{2}$ -in. meshes. These screened pieces are then covered by a thin coating of cement, and the brick is moulded. It will be observed that the cement is not mixed with the pumice so as to form solid cement blocks; but by the fragments being coated first, the brick is obtained by these coatings adhering to one another. The result is a very light and vesicular brick. Although used largely even for exterior walls in Germany, it is not very strong. These bricks seem specially adapted for light partition walls, for which purpose they are now being used in this country.

THE experiments connected with the moulding of marble by pressure, conducted by Professors Adams and Nicholson at McGill

University, Montreal, seem to be highly successful. Carrara marble was principally operated upon, and this was confined in specially-prepared steel and iron tubes having an accurately-fitting sliding steel plug inserted in either end. These tubes are so made that when cold a column of marble carefully turned and polished, and slightly tapering at one end, may be pushed half way in the tube. The latter is then expanded by being heated so that the marble column may be forced right in. Of course, when the tube cools again the marble is not only tightly clenched, but is even being subjected to considerable pressure. The greatest pressure, however, is exerted at either end by means of the plugs referred to, and in these experiments it is said that a pressure of 80,000 lb. to the square inch was obtained, and this could be kept up for some weeks if desired. The pressure causes a molecular re-arrangement of the calcite crystals, whereby these latter are to some extent re-formed, and as during the experiment the tube is bulged out the marble is found to give way also, and to take on the exact shape of the interior of the tube. Thus it may truly be said that the marble is moulded by pressure. Whether the experiments will be found to have much practical value remains to be seen. The marble subjected to such great pressure differs slightly from the original; it is not as hard and is doubtless more brittle. We should have thought that similar results could have been obtained by an adaptation of the experiments made by Sir James Hall a century ago. He placed pounded chalk hermetically enclosed in gun-barrels and exposed them to the temperature of melting silver, when it was found that by retaining its carbonic acid the chalk had actually crystallised and become a white marble. At a later period Gustave Rose repeated these experiments and produced by dry heat, from lithographic limestone and chalk, fine-grained marble without melting. The characteristic crystalline structure of marble has frequently been obtained artificially, superinduced by heat under pressure. As to how far large mouldings of marble could be made by the last-mentioned method we know not, but we can see no inherent difficulty in the matter. It does not seem to be such an intricate way to produce moulded marble as that adopted in the Montreal experiments referred to.

DR. R. J. REECE'S report to the Local Government Board on fever prevalence at Aldbrough, in the Skirlough Rural District, gives a fairly favourable account of the buildings, but a very bad one of their surroundings. "In many instances there are merely privies, often close to the dwelling-house; in other instances there are pail closets. Connected with the privies are ashpits: these are never covered over, being in most instances mere holes in the ground; or the refuse is placed on the ground near the privy. Sometimes the site of the refuse tip is marked out with rough brickwork; the floor of this rude ashpit is in most instances below the level of the ground, and no attempt is made to keep it watertight. The scavenging of privies and refuse heaps is left to the inhabitants. The water supply of the village, other than the rainwater used for household purposes, is derived from shallow wells." The italics are ours.

DR. S. W. WHEATON, in his report to the Local Government Board on the sanitary circumstances of the Bettws-y-Coed Rural District and on the prevalence of enteric fever and diphtheria in the district, says that the dwellings are for the most part well built, but old cottages, which each contain two rooms only, are to be found in most of the villages, and such dwelling are without through ventilation. The surroundings of dwellings were, moreover, not satisfactory in the majority of instances. The water supply and the sewage and excrement disposal appear to be very unsatisfactory, and Dr. Wheaton quotes the condition of the village of Cwm Penmachno as an illustration of the results of the complete neglect in the district of all sanitary matters. The roads and paths in this village are unmade and untended. The water supply is very unsatisfactory. There is no system of sewerage. Many dwellings are without house drains for conveying away slop-water, and where such drains are provided they are merely rough rubble channels. Household refuse is allowed to accumulate in the neighbourhood of dwellings, except in the case of houses near the banks or the small stream passing through the village. The refuse from such houses is thrown into the stream or accumulates on its banks until a flood washes it away. Privies are either situated over small water-courses, or discharge directly on the surface of yards; or the excreta are received into receptacles constructed of loose stones or slates, from which the filth soaks away into the ground. The site is naturally a damp one, owing to the situation of the village at the base of a high mountain; and at the time of his visit many of the yards around dwellings were quagmires, composed, in large measure, of organic refuse. The inhabitants of this village are chiefly slate quarrymen and small farmers. As the district is much frequented by visitors during the summer months these unpleasant facts cannot be too widely known.

THE Apothecaries' Company, trustees of the garden, lately applied to the Charity Commissioners for relief from their trusteeship, finding themselves no longer equal to the charge upon their resources. The London Parochial Charities' trustees having signified their willingness to take over the trust and to maintain the gardens for purposes of botanical study, the Charity Commissioners will prepare a scheme accordingly. The garden, which is situated between Queen's-road and the riverside embankment at the east end of Cheyne-walk, covers more than three acres, and was originally leased from Lord Cheyne by the Apothecaries' Company, in 1673, for a large and boat-house. In 1721 Sir Hans Sloane, who had purchased Chelsea manor from the second and last Lord Cheyne, presented it to the Company in trust upon the expressed condition that "it should at all times be continued a physic garden for the manifestation of the power, and wisdom, and goodness of God in creation, and that the apprentices might learn to distinguish good and useful plants from hurtful ones." Sloane also stipulated that fifty specimens of plants reared therein should be sent annually to the Royal Society until 2,000 were delivered. The presentations continued to be made at



intervals until the year 1793; in 1853 the herbarium was given to the British Museum. The "Mr. Watts, keeper of the Apothecaries' garden of simples at Chelsea," whom Evelyn visited, as his diary for August 7, 1685, records, planted the four cedars, whereof one yet survives. The Company set up Rysbrack's marble statue of Sloane in 1733. In the gardens, a favourite haunt of Evelyn, Linnæus (1736-8), Sir Joseph Banks, and of Mrs. Blackwell, who there compiled her "Herbal," Phillip Miller, author of the "Gardener's Dictionary," worked as gardener to the Company nearly fifty years; the Horticultural and Linnæan Societies erected his monument in the (old) parish churchyard.

M. RAULIN, the architect, has received instructions from M. Picard, the Commissary-General for the 1900 Exhibition, to construct in the middle of the *Galerie des Machines* a "Salle des Fêtes" to seat 15,000 persons. This will occupy seven bays of the *Galerie*, and will be square on plan but with seats arranged on circular lines. Two new façades are to be formed the whole width of the *Galerie*, one towards Avenue la Bourdonnais and the other towards Avenue Suffren, each with a central flight of steps, or *perron*, leading up to two staircases one at each side, the whole embellished with the usual French decorative features of triumphal arches and pylons, and with a cupola over the centre landing, 90 metres in diameter. The whole interior is to be adorned with sculptures and paintings by the leading artists of the day. The new façades will be a great improvement to the vast building, the two ends of which want something more than the mere engineering lines of structure which now show. But it seems a pity to break up the perspective of that grand roof by inserting an erection in the middle of the building; and the scheme threatens to raise again the difficult question; how to provide for the two annual Salons, which certainly cannot well be housed in the *Galerie* next season, if all these alterations are going on within it.

#### THE ARCHITECTURAL ASSOCIATION: TWENTY-NINTH ANNUAL EXCURSION: LEAMINGTON AND NEIGHBOURHOOD.

MANY years having elapsed since the Architectural Association made Warwick their headquarters for an excursion, it was decided this year that Shakespeare's Land should be once again chosen as the venue, and Leamington, by reason of its advantages as a centre and the possession of a suitable hotel, was selected as headquarters. The majority of the excursionists took up their quarters on Saturday, and by Monday morning the party was virtually complete.

Sunday was spent, as usual, quietly, in strolling through the well-laid-out and well-kept streets of Leamington; visiting its churches, especially the fine church by George Gilbert Scott, jun., in the suburb of Milverton, and dedicated to St. Martin, 1879. In the afternoon some of the party drove by the beautiful roads through the remains of the Forest of Arden to Coventry, visiting its churches, its half-timbered almshouses, and its Town Hall.

#### Monday.

In spite of the fact that the preceding day stands recorded as the coldest in the month of August for fifty years, and was marked also by a heavy rainfall in other parts of England, the excursionists were fortunate enough to find their first day of work fairly pleasant in climatic conditions. The recent innovation of train journeys in A.A. excursions has, in the present programme, been fully employed with the

advantage of extending the possible radius of operation. The train therefore was taken to Kingswood, and then carriages for the rest of the day till the return from Berkswell.

The first halt was made at Baddesley Clinton, where the chief attraction was the Hall, an illustration of the entrance to which we gave last week, showing the bridge over the moat which forms the only approach to the house. Reminiscent of Ightham, this moated house is very charming in its colouring of grey stone, lichen, half timber, brick and tile, all set off and enhanced by the water. Baddesley Clinton Hall, from the middle of the thirteenth and fourteenth century, belonged to the Clinton family, of Colehill. In 1496 it became the property of Nicholas Brome, who erected the tower of the church, and at his death it passed, by the marriage of his daughter Constance, to Sir Edward Ferrers, grandson of William Lord Ferrers, of Groby, and in this family it has since remained.

The house is built around three sides of a quadrangle, and although it has been surmised that like Ightham and other examples, it was formerly continued around the fourth side, there is very little internal evidence to justify the surmise. The tower shown in our sketch last week leads to the quadrangle or courtyard, on the left hand side of which is the entrance to a small ante room leading to the great hall, a highly interesting room with oak panelling, and carved stone chimney-piece of date about 1634, ornamented with shields of family arms and coloured. Fourteen shields with heraldic devices of sixteenth and seventeenth centuries are inserted in the glazing and give the alliances of the Ferrers for several generations. The house is full of the household gods of the Ferrers, collected during their long occupation, and furniture and bric-a-brac from the seventeenth century downwards add much to the charm of the house.

The delights of colour kept many of the party chained to the house, but many went to see the church, of which the best part is shown in our illustration of last week.

The nave of the church appears to have been originally erected in the thirteenth century, and the date of the Perpendicular addition is in this case well authenticated, the walls having been raised to ft., and the existing clearstory windows inserted between the years 1496 and 1508 by Nicholas Brome, Lord of the Manor, who also built the tower in expiation of manslaughter—or was it justifiable homicide?—as thus related by "Dugdale":

"Coming on a time into his parlour here at Baddesley he found the parish priest chocking his wife under the chin whereat he was so enraged that he presently kill'd him: For which offence obtaining the king's pardon and the Pope's he was enjoynd'to do something towards the expiation thereof; whereupon he new built the towre-teeple here at Baddesley from the ground and bought three bells for it, and raised the body of the church ten foot higher all which was exprest in his epitaph now torn away."

From our illustration it will be seen that before Nicholas Brome thus expiated his offence (the church was of very modest pretensions).

The chancel was rebuilt in 1634 by Edward Ferrers, then Lord of the Manor, as is recorded by a stone over the south door, which states:—

"Edward Ferrers, Esquire, sonne and heire of Henry Ferrers, Esquire, and Jane White, his wife, did new builde and redifie this chancel at his owne proper costes and charges. Ano. Domi. 1634. This church is dedicated to Sainte James."

In the chancel is a sixteenth century canopied monument, decorated in rather startling primary colours, probably original, and less toned from their bizarre effect than are most examples of mediæval colours as we now see them. On the tomb is the following inscription:—"Here lyeth Sir Edward Ferrers, Knighte, sonne and heire of Sir Henry Ferrers and Margaret Hekstall, his wife, of East Peckham, in the county of Kente, Knighte. He died the xxixth day of August, 1535, leaving issue, Henry, Edward, George, and Nicholas. Here also lyeth Henry Ferrers their eldest sonne and heire, who married Katherine, daughter and one of the co-heires of Sir John Hampden of Hampden, in the countie of Bucks. He died Ano Domi 1548, leaving issue Edward Ferrers, married to Briget, daughter to William, Lord Windsor, of Bradenham, 1548, and died Ano Domi 1564."

From Baddesley Clinton the members went

on to Knowle, where the first visit was paid to the church, built as a chapel of ease to the mother church at Hampton, in consequence of the difficulty which the inhabitants experienced in bad weather of getting to church, by Walter Crook, Canon of Lincoln. The building was consecrated February 24, 1402; a special Bull being granted by Pope Boniface IX., with indulgences for those who attended to the church and contributed towards the repairs. The chief feature of the church is the rood screen, with its exceedingly rich and somewhat curious treatment of traceried fans. It has been moved from its original position, and probably more or less doctored as well as mutilated, but is still a fine example and worthy of study. The church has evidently been lengthened and the clearstory raised in the fifteenth century, and in the lengthening there has been an approach made to the Warwickshire apse. There are some half timber houses and a manor house in the village of Knowle, but the best piece of domestic is about half a mile north, known as Grimshaw Hall, a corner of which is shown in our illustration last week. Although not large, this house is a charmingly composed piece of half timber work of early seventeenth century date. On the customary plan, with the side wings projecting behind much more than usual, a quasi-quadrangle effect is obtained at the rear which makes the back of the house almost more picturesque than the front. The front porch is a good piece of design, a piquant effect being obtained by the balustraded sides. Internally several of the old doors and fittings remain with their ironwork.

Very little is known of the family of the Grimshaws, who probably built the house, but, according to Dugdale, Sibill, daughter and co-heiress of Thomas de Maidenbach, and wife of Adam de Grymesarwe, in 1510 inherited the manor of Aston and Dudson, and there was formerly a slab in Solihull Church recording the death of "Richardus Grimshaw, Nuper de Bakers Lane, Gent.," in 1660.

From Knowle the excursionists drove to Temple Balsall, to see the very fine church of late thirteenth-century date, remarkable for its unbroken interior as well as for its exquisite detail. It is, in fact, a single hall of fine size and proportion, suited for use as a chapel rather than for the numerous individual services of a mediæval parish church or abbey.

Temple Balsall indicates by its name that the manor was held by the Knights Templars, who in the reign of Henry III. received it from Roger de Mowbray, "where upon erecting a Church fit for their service of God and a house for habitation, they sent part of their fraternity hither and made it a Preceptorie or cell subordinate to their principall mansion, viz., the Temple, in London. Unto which Preceptorie were also divers lands of good value afterwards given by sundry persons of qualitie."

The Templars being suppressed in 1307, the property was in 1312 transferred by a decree of Pope Clement V., with other possessions of the Order, to the Knights Hospitallers. They do not seem to have resided here as did the Templars, but put in a farmer as tenant. After the dissolution of the monasteries the property formed part of the dower of Queen Katherine Parr; subsequently it came into the possession of Edward Duke of Somerset, and afterwards of John Dudley, Earl of Warwick. In the reign of Elizabeth it was granted by letters patent to Robert Dudley, Earl of Leicester, and descended to his granddaughter, Lady Leveson, at whose death it was bequeathed to trustees for the purpose of founding a hospital or almshouses, "as near the church as conveniently might be, for twenty poor persons, being widows and poor women, not married, of good lives and conversations."

After Temple Balsall the next and last item on the day's programme was Ram Hall, which, as may be seen from our sketch of last week, is a simply treated house of regular outline, principally built of stone but with red brickwork to the gable ends as indicated in the sketch. The most salient feature is the one great red brick chimney stack into which all the flues are gathered. Ram Hall, or as it is locally known, Hill House, from its situation, is but a short distance from Berkswell Station, from which the party returned by rail to Leamington, arriving in a heavy shower, the first rain of the day.

#### Tuesday.

The second day was devoted to the ancient and historic town of Warwick, of which Leamington may almost be called



a suburb, connected as it is by a continuous succession of houses and a tramway line, of which advantage was taken by the members. Warwick is said by Rous, the historian of the county, to have been a British town of considerable importance prior to the Roman invasion, and this statement is confirmed by Camden, Dugdale, and other writers. The same author relates that, after its devastation by the frequent incursions of the Picts, it was rebuilt by Caractacus, on whose defeat by Claudius, in the year 50, the Romans, in order to secure their conquests in Britain, erected several fortresses on the banks of the Severn and Avon, of which latter Warwick Castle was one; but this is very doubtful, the nearest Roman station having, probably, been that at Chesterton. Upon the establishment of the Saxons in the island, this town, included in the kingdom of Mercia, fell under the dominion of Waremund, who rebuilt it and, after his own name, called it Warre-wyke. It appears, however, from a coin of Hardicanute that its Anglo-Saxon name was Werhica, but from either of these sources its present name may be derived. Warwick was subsequently destroyed by the Danes, and, according to the most authentic records, Ethelfleda, daughter of Alfred and Countess of Mercia, restored it about the year 913 and built a fort, which evidently forms the most ancient part of the present castle, and which is still pointed out to visitors. At the time of the Conquest this fortress was considerably enlarged, and the town was surrounded with walls and a ditch, of which there are still some vestiges, and of which a memorial is preserved in the appellation of a certain part of the town, called "Waldyke." In the reign of Edward I. the fortifications were repaired by Guy, Earl of Warwick, who, in 1312, with the Earl of Lancaster, having taken Piers Gavestone, the favourite of Edward II., brought him from Wallingford Castle, where he was secured for the night under the Baron's guard, to Blacklow Hill, about a mile from the town, where he was tried and beheaded. In 1566, Robert, Earl of Leicester, celebrated in St. Mary's Church the ceremony of the Order of Michael, which, by permission of Elizabeth, had been conferred upon him by Charles XI. of France. William Parr, brother of Catherine, the last consort of Henry VIII., assisted at this ceremony, and, dying soon after, was buried in the chancel of the church. Queen Elizabeth visited Warwick in 1572 on her route to Kenilworth Castle, where she remained for two or three days, and where also, in 1575, she was sumptuously entertained by the Earl of Leicester for seventeen days, and amused with costly pageants and magnificent spectacles, at an expense of not less than 1,000*l.* per day; and in 1617 James I. visited the town, and was splendidly entertained in the great hall of the Earl of Leicester's hospital, in commemoration of which a tablet, with an appropriate inscription, was put up on one of the walls of that building. During the great Civil War in the reign of Charles I., Robert Greville, Lord Brooke, embraced the cause of the Parliament, and defended the castle against the King. Being obliged to repair to London, in order to procure a supply of arms and ammunition, he deputed Sir Edward Peto governor during his absence. The supply being obtained, he was met on his return by the Earl of Northampton with a considerable force near Edge Hill; instead of fighting, terms were mutually arranged, so that Lord Brooke deposited his artillery and ammunition in Banbury Castle and returned to London. After his departure the Earl, having attacked Banbury Castle and taken the military stores, advanced to Warwick and laid siege to the castle, which was defended by the governor for fourteen days, till Lord Brooke, on his return from London after a successful skirmish with the Earl near Southam, came to the assistance of the garrison and compelled the Royalists to abandon the siege. William III., in 1695, visited the town, of which, in the course of the preceding year, more than one-half was destroyed by a great fire, during which the Collegiate Church of St. Mary, with the exception of the chancel, the Beauchamp Chapel, and the chapter-house, was destroyed. The first visit made by the excursionists in Warwick was to the Leicester Hospital, originally a hall of the united Guilds of St. George and Holy Trinity, which appears to have been erected in the reign of Henry VI. At the time of the Dissolution the hall was given by the master and brethren to the burgesses of Warwick for the Burgess Hall, and the chapel was used as a school. The Earl of

Leycester, wishing to found an almshouse or hospital, made an application for the building to be handed over to him for the purpose, and on November 5, 1571, the bailiff and burgesses agreed to his proposition, and on December 26 in the same year the deed of gift was prepared and sent up to the Earl as a New Year's present. Dugdale tells us that the inmates of the hospital, who were to be twelve in number besides the master, were to be "impotent persons, not having above five pounds per annum of their own, and such as either had been or should be maimed in the wars in the said Q.'s service, her heirs and successors, especially under the conduct of the said Earl or his heirs, or had been servants and tenants to him and his heirs, and born in the counties of Warwick or Gloucester, or having their dwelling there for five years before; and in case there happen to be none such hurt in the wars, then other poor of Kenilworth, Warwick, Stretford-super-Avon, in this county, or of Wotton-under-Edge, or Erlingham, in Gloucestershire, to be recommended by the Minister and Churchwardens where they last had their abode; which poor men are to have liveries (viz. gowns of blue cloth, with a ragged staff embroidered on the left sleeve) and not to go into the town without them."

The visitors were conducted over the hospital and received by the Master. The date 1571 appears repeatedly on the building, and most of the building is probably of about that date. It goes without saying, therefore, that its half-timber treatment is especially picturesque, notably in the quadrangular court, around which the dwellings of the Master and Brethren are grouped, and the effect of which, with its gallery and open plan, is particularly piquant. The chapel being built over what was the west gate of the town, and rising from the visible rock foundation, is very striking in its composition, and loses nothing, but rather gains considerably, in effect from the flying buttresses added in 1863, despite the fact that these and the inserted windows are in detail some centuries earlier than the building to which they have been added.

From Leicester's Hospital the members proceeded to the Priory, now the private residence of Mr. Sampson Lloyd, but deriving its name from the fact that here was founded, by Henry de Newburgh, first Earl of Warwick, and his son Roger, a monastic establishment for Canons Regular, and dedicated to St. Sepulchre. At the Dissolution the property was granted to Thomas Hawkins, a retainer of the Duke of Northumberland, John Dudley. Hawkins pulled down most of the monastic buildings, a very few remains of which may still be seen, and built the present house, completing it in 1566. The north front, a portion of which is shown in our sketch last week, is the work of Hawkins, but the south front was rebuilt about 1750. Many successive alterations have been made since that time, so that the house has the charm inseparable from a building that has grown to its present form under the hands of many owners. The members enjoyed to the full the house, the grounds, the hospitality of the owner, and the society of his family.

Leaving the Priory with reluctance, a short visit was paid to the Church of St. Mary—curious in its detail, but scarcely admirable even with our up-to-date penchant for eccentricity. The Beauchamp Chapel received a larger share of attention, not so much for its architectural merit as for the interesting series of tombs it contains.

After the church the members made their way to the castle, well known as one of the finest examples of fourteenth century military architecture to be found in the country. It did not appeal to our excursionists, however, as an example of mediaeval fortification so much as, under the influence of a bright and sunny day, the beau ideal in its environment of a nobleman's country residence, and in the interior as a marvellous storehouse of priceless paintings and costly furniture—an example of the museums in which the wealth of England in artistic treasures is stored. The river Avon was crossed to obtain the view of the flank of the castle, the Warwick vase was duly visited, and most of the party climbed laboriously to the top of Guy's Tower for the sake of the beautiful view to be thence obtained.

The last visit of the day was to St. John's House, formerly a hospital "for entertainment and reception of strangers and travellers, as well as those that were poor and infirm," founded by William de Newburgh, Earl of Warwick, in the reign of Henry II.

The present house was built about 1626, by Anthony Sloughton, whose grandfather obtained the property by grant from Queen Elizabeth. The building is a picturesque example of seventeenth century stonework, with transomed bay windows, curved gables, and open parapets. Internally there is a good Jacobean oak staircase, and some oak panelling. This completed the programme of a very full day; so full, indeed, that several of the members were satiated and satisfied to return to Leamington with the last item omitted.

We shall continue our account of the Excursion next week.

#### ARCHÆOLOGICAL SOCIETIES.

SURREY ARCHÆOLOGICAL SOCIETY.—The annual excursion of this Society took place on the 28th ult. The members and friends assembled at Farnham Railway Station, under the presidency of Viscount Midleton, Lord Lieutenant of Surrey, at 12 o'clock (noon). A drive was made from here to Moor Park, where a paper was read on "Moor Park and its Associations," by the Rev. W. H. F. Edge, M.A., Vicar of Tilford. Mr. Edge said Sir William Temple came here in 1689 and wrote many of his memoirs and essays here; he also laid out the gardens and terraces. With him came Dean Swift, and also Mrs. Johnson and her daughter, Esther, afterwards known as Stella. King William III. also visited Moor Park. Dr. Lane subsequently took the house and formed it into a hydropathic establishment, and amongst those who attended here was Darwin. On the motion of Viscount Midleton, Mr. Edge was thanked for his interesting paper. The party then proceeded by way of "Stella's Cottage" to Mother Ludlam's Cave, the history of which was briefly described by the Rev. Mr. Edge. The next drive was to Whitmead, where a collection of Palæolithic and Neolithic implements, flints, celts, &c., also Roman coins and pottery, found in the neighbourhood by Mr. George Gibbons, was exhibited. After partaking of luncheon, at the invitation of Colonel John Davis, an inspection was made of the remains of ancient entrenchments in the grounds, which were pointed out and described by Mr. Ralph Nevill. The excursionists then drove by way of Crooksbury to Waverley Abbey. Here the ruins and site of the abbey were traced and described by Mr. W. H. St. John Hope, M.A. He said that Waverley Abbey was the first house of the Cistercian order built in England. This order took its name from the Abbey of Cîteaux, in the Bishopric of Chalons, in Burgundy, which was begun in 1098. Waverley Abbey was founded in 1128 by William Giffard, second Bishop of Winchester, for the reception of an abbot and twelve monks, whom he brought from Aumône, in Normandy. The Bishop, with the assent of King Henry I., bestowed upon them in perpetuity the land or manor of Waverley, with two acres of meadow at Elstead. William Giffard, the founder of the Abbey, died January 23, 1129, within two months after the date of its foundation (November 24, 1128), and was buried at the east end of the nave of Winchester Cathedral. Waverley Abbey was suppressed in 1536 because it was not of the annual value of 200*l.*, the gross income being returned at 196*l.* On September 21, 1278, the Abbey church, being completed, was dedicated by Bishop Nicholas de Ely, Bishop of Winchester, who died February 12, 1280, and was buried in the Abbey church at Waverley. The party were afterwards taken round the ruins, the foundations of which are being excavated and laid open for inspection, and which were explained by Mr. Hope under great difficulties, as the clouds gathered round and the rain came down in showers. An excellent paper on Waverley Abbey by Mr. F. J. Baigent will be found printed in the eighth volume of the Society's "Transactions." The company then returned to the Bush Hotel at Farnham to a cold collation at 6 p.m., after which the meeting dispersed. A few, however, lingered in the town and inspected the exterior of Farnham Castle, with its tower and kitchen garden on the top of the same, also the quaint old inn near the church, the "Jolly Farmers," the birthplace of Cobbett, and of which there is an illustration in the *Builder*, April 26, 1896.

APPOINTMENT.—The Lords of the Committee of Council on Education have appointed Mr. Walter Crane to the principalship of the Royal College of Art at South Kensington, vacant by the retirement of Mr. Sparkes.



## Illustrations.

### ILLUSTRATIONS OF DUNDEE ARCHITECTURE.

THE illustrations of Dundee architecture are all referred to in the leading article of this issue.

They comprise a view of The High School, by the late Mr. John Angus, the Custom House, by the late Mr. Taylor, the Royal Infirmary, by Messrs. Coe and Godwin, and the Lochee Free Library and Baths, by Mr. J. Murray Robertson; a Group of Churches—St. Mary the Virgin; St. Patrick's R.C. Church and a Baptist Church, both by Mr. T. Martin Cappon, and St. Enoch's, by Mr. T. S. Robertson; and two examples of street architecture, the Caledonian Insurance Company's offices and Tyffe's buildings, Nethergate, both by Mr. J. Murray Robertson.

### THE OAK HOUSE, WEST BROMWICH.

This old house has been extensively restored, and was opened on July 25 as a museum. It has been presented to the town by the munificence of Mr. Alderman Farley, and is one of the most interesting timber-built houses in the country. The original house, built about the middle of the fifteenth century, was what may be described as a yeoman's homestead; later, when its occupants the Turton family became more important, it was considerably enlarged. These additions are shown on the plan; they date early in the seventeenth century, and are conspicuous from being in brick, in many parts built on the face of the old timber walls.

The house has historic as well as architectural interest. It played its part in the troublous times of the Civil War in the seventeenth century; it is even suggested that the unique feature of the lantern was built for military purposes. This is, however, doubtful, the evidence of the enrichments of the timbers point to its being of an earlier date than that at which alterations were made in the house for the accommodation of soldiers. In any case it must have been built to obtain a view of the surrounding country, then thickly overgrown by forest trees. Most of the rooms are panelled in oak and beautifully moulded and carved, all of the seventeenth century, probably at the same time as the extension.

The house for some time has lain in a state of semi decay; the present restoration has been carefully conducted by Messrs. Wood & Kendrick, architects. No contractor was employed, but a staff of men were kept at work under constant supervision. Paint has been carefully removed from the interior oak work, windows long blocked up have been opened out, and in the case of necessary repair the renovation is easily detected. The garden has been laid out to harmonise with the old fashion of the place, and a broad terrace built at the back of the building on the verge of a bowling green.

### AN AMERICAN VIEW OF CHURCH ARCHITECTURE.

WE mentioned some time ago a paper by Mr. R. Clifton Sturgis, of Boston, on church architecture, included in the report of the last Annual Convention of American Architects. It may be of some interest to English architects to see how the subject is regarded from the American point of view, and we therefore reprint the paper in full, now that the demands upon our space are not so great as at other times of the year.

"The subject of church architecture is so wide and the circumstances attending its growth in the various Christian countries were so different that it would be impossible, in a short address, to do more than catalogue the subjects and make a barren schedule. Rather than do this I propose, therefore, to pass over without comment those periods and styles which have no vital interest, except for the antiquarian and the student of church history, and no relation to the modern problems with which we are to-day confronted, and confine myself to those times and places which seem most pregnant with suggestion. The early centuries of church building are days of infant growth, as far as architecture is concerned, days when the Church was fully occupied as a missionary body carrying the gospel to all countries. Later, when the Eastern and Western Churches divided, and church architecture as an art was beginning to take form, it was yet among

peoples so far removed from us in time and habits of thought, in circumstances and traditions, as to furnish but little suggestion for our modern problems. Early Italian work, whether Roman, Florentine, or Venetian (and the more Eastern work of Constantinople) is but slightly in touch with our Western ideas and civilisation. Neither St. Mark's nor St. Sophia would seem in place in Chicago or Denver.

Notwithstanding the fact that in form and in spirit this work is out of harmony with modern ideas and Western life it gives us the most splendid example of the use of colour, a standard for all time. Unfortunately we are not, as a people, colourists, and it is only with great care and restraint that we may attempt the use of colour, and in following such splendid examples one is more likely to go astray than to accomplish anything that even faintly reflects their glory.

We are all distinctly a Western and a Northern people, as our fathers were before us, and we have inherited their traditions, their strength, and their weakness; it is to them we must look for our best precedents.

Not until Europe begins to settle down, its roving and marauding population gradually finding permanent centres of life and interest, in the Western Empire, in France and in England, do we find the beginnings of a church architecture which can really be considered as belonging to us. In Southern France a half-forgotten classic, infused with new and vital ideas, was producing the Romanesque, of which one phase was leaving its indelible mark on Normandy, and through the Norman dukes and English kings, on England.

But it was still, ecclesiastically speaking, but a first word, and it is not in the early expression of a yet undivided Catholic Church that we shall find our chief inspiration for modern work. Nor is it on the continent of Europe that we find the people whose lives and habits of thought are most nearly like ours, and whose work is, therefore, most suggestive.

The peoples of Southern Europe, impetuous and emotional, found in the pagantry and power of the Church which Rome and its Pope represented a true expression of their longings and aspirations. Italy, Spain and Austria have found in Roman ecclesiastical authority and in obedience the essence of their spiritual life. The Northern people who were eventually responsible for North Germany, Holland, and England, were less wealthy, less powerful, less able to maintain magnificence, more independent of spirit in matters both civil and ecclesiastical.

From the earliest days which mark the beginning of Papal power we find the English either asserting their previous religious independence or rebelling against the imposition of foreign priestly and episcopal rule.

The traits which marked their character left their impress on the architecture of the time. The Normans, who first built on the lines of anything that could be called a style, departed widely from the current ecclesiastical architecture. Their churches were small, homely, simple, and unpretentious. In Italy the growing magnificence of the Church was gradually replacing the departed glory of Imperial Rome, but Northern Europe and England were but just emerging from barbarism. The seeds of the Christian religion, planted long before in Britain, had produced a very simple type of church buildings, and the simplicity of these early days grew very slowly under the Norman kings to a rude sort of magnificence.

Gradually out of Saxon, Dane, and Norman came the English type—sober, self-reliant, courageous, independent. In that last is their strongest and most precious link with us. It is the barons fighting for Magna Charta or rebelling against Piers Gaveston; it is Chaucer boldly satirising the evils of the day; it is Erasmus and More pleading for intelligence and reform; it is Hampden denouncing injustice and oppression and pleading the cause of the people; it is Pitt working for the good of the many; it is Wilberforce demanding justice toward the enslaved. These are the men and the deeds which link us to England, not ties of blood merely, for with the great mass of us these do not exist, but ties of common thoughts and aspirations and ambitions.

It is of the church architecture of these people that I wish more especially to speak, and of that period of their work which seems to me most nearly in touch with our own life of to-day here in this country. We are past the days of barbarism, and have, perhaps un-

happily, outgrown the earlier simplicity and singleness of aim. We are also past the days of intolerance and bigotry, and with it, I hope, fairly unprejudiced eyes may look back and try to see what is best in the work of England under Norman bishops, of England independent, of England in Reformation hands, and of England in what I might call, restoration days—meaning not a Stuart restoration of misrule, but a Church restoration of that which, in the haste of reform, had been forgotten or left behind. Under all these varying circumstances and conditions English work was always distinctly English. Although their builders or architects were not as a rule imaginative designers, they never adopted a motive or an idea from abroad without putting an English stamp upon it. The earlier Gothic work was as clearly English in its character as was the latest phase of Perpendicular.

Now the simple character and aims of the English lie behind all their work. Even their cathedrals are magnificent more by their magnificent settings than by their architecture which, when all is said and done, is homely—yes, homely and home-like. A directness of purpose and a lack of what one might call either self-confidence or overweening ambition mark all their work.

Of the cathedrals of England much has already been said, and so well said that one naturally passes them by, the more so that we have but few opportunities to build cathedrals. It is the parish churches which may really serve to teach us much and to guide us in similar work here. All classes of Christian people are undoubtedly drawing together in this great and united country. The Roman Catholics seem more free and less trammelled than in the old Catholic countries; the other bodies are no longer narrow and intolerant as they were in days which condemned, as touched with the mark of the beast, anything which was lovely or which added dignity or beauty to the service of God.

The same bodies who 200 years ago would not even name a church, but met together for prayer in unadorned meeting-houses, to-day desire those forms and features which have the holy association of Christian use. It is not, therefore, out of place to look a little closely into those forms as we see them embodied in the parish churches of our Christian forbears. These are scattered all over England, and embrace the period from the twelfth to the sixteenth centuries.

The buildings of this period remaining to us are nearly all country churches, or churches in small towns. All were originally built on lines which pre-supposed light and air, trees and space about them. They are not, therefore, examples for modern city work—of that I will speak later.

For the country, they have proved themselves, through many generations of use, to be suitable; and no one can be familiar with the country churches of England without feeling their perfect charm, their peaceful churchly character, and the spirit of worship which seems to pervade them. The most striking feature of these churches is that they are long, narrow, and low. Among the thousands of churches built during these centuries there is hardly one but has these characteristics. Occasionally generous side aisles may give an appearance of width on the ground plan, but this is not apparent inside, where the lines of nave and clerestory carry the eye down to the distant chancel.

The long and narrow church, undoubtedly, we owe to Norman influence, for in the Norman churches it is invariable, and the later churches of the thirteenth and fourteenth centuries were in many cases built on the lines of an earlier Norman building. One might safely say that the average length of the chancel was double the width, and that of the nave from three to four times its width. It is evident, therefore, that this shape was found satisfactory to these many succeeding generations of people to whom church-going was a most vital part of every-day life.

There are many things to recommend this plan. The narrowness gives value to the length, which, on a small scale, might otherwise be of no architectural importance, and the length gives dignity to what is the focal point of interest, with all Catholic bodies, the altar, and with others, the preacher's desk and chair. The long narrow nave has proved satisfactory as an auditorium, for it is practically a speaking tube. It is true that roof screens, or intervening arches, often interfered with its acoustic





THE HIGH SCHOOL—(THE LATE MR JOHN ANGUS)



THE ROYAL INFIRMARY—(MESSRS COE & GODWIN)



THE CUSTOM HOUSE (THE LATE MR TAYLOR)



LOCHEE FREE LIBRARY AND BATHS.—(MR. J. MURRAY ROBERTSON.)

NAME: DOTT SCRAE, EARL 445 EAST HARDY, 5 LEFT SETTER, AND CO







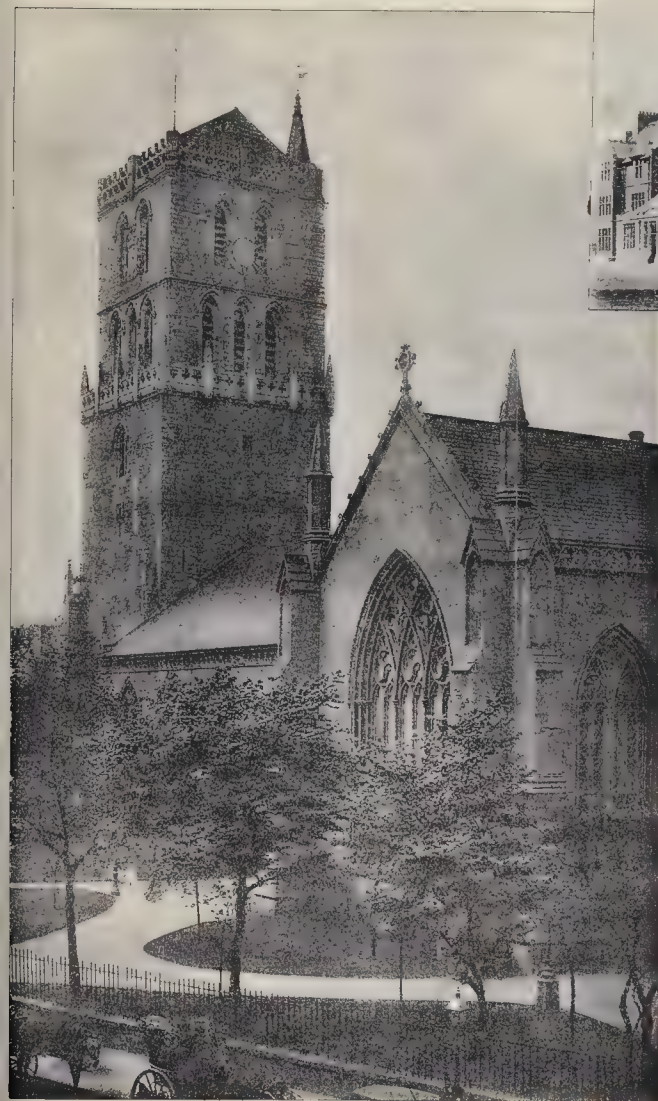
SAINT PATRICK'S R.C. CHURCH.—(MR. T. MARTEN CAPPON.)



BAPTIST CHURCH.—(MR. T. MARTIN CAPPON



ST ENOCH'S CHURCH — (MR. T. S. ROBERTSON)



THE CHURCH OF ST MARY THE VIRGIN







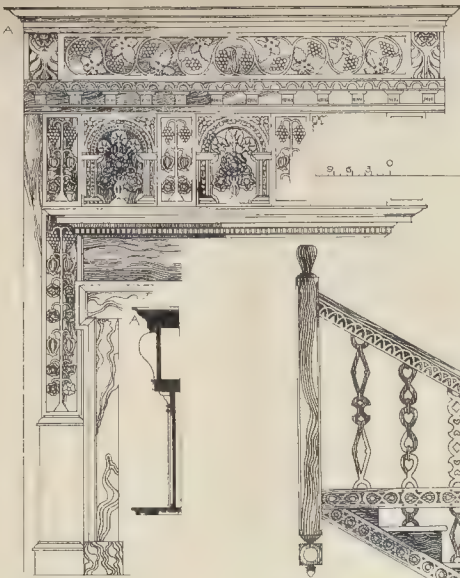
THE CALEDONIAN INSURANCE CO'S OFFICES (MR J MURRAY ROBERTSON)



TYNE'S BUILDINGS NETHERGATE (MR J MURRAY ROBERTSON)

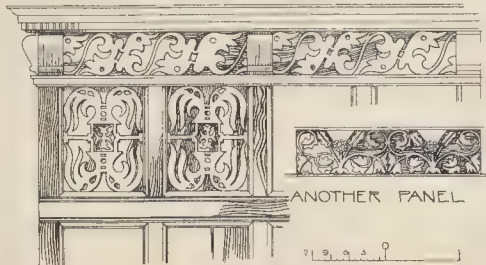






FIREPLACE IN FRONT BED RM

SOME OAK BALUSTERS AND CARVED ENRICHMENTS



OAK PANELLING IN LIBRARY

ANOTHER PANEL



WEST ELEV.



VIEW FROM THE NORTH WEST



TRANSOM MULLION ANGLE MULLION

HATCHED SHEARS ORIGINAL BUILDING CIRCA 1450  
BLACK SHEARS AND TONGS IN BRICK CIRCA 1620  
PANELLING IN ROOMS SAME DATE AS ABOVE

GROUND PLAN



SOME DETAILS  
OF THE  
OAK HOUSE  
WEST BROMWICH  
STAFFORDSHIRE

W. & J. GREEN  
MENZIES & CO.





properties, but in the early days the sermon was the only part of the service which required to be heard, the rest was the repeating of familiar and hallowed words, everywhere alike, and in even the longest churches they would be sufficiently audible to be easily followed, and the sermon was generally delivered from the nave.

For our modern use this plan is suited without change to all bodies which use a ritual, for to them it gives opportunity to emphasise the chancel and altar, to gain the dignity of at least one grand dimension in a small building, and yet, by placing the pulpit at the crossing or in the nave make a perfect auditorium. A building 20 x 80 gives the architect a better chance both inside and outside than a building 40 x 40, and, if true on so small a scale, it is equally so with grander dimensions; as, however one enlarges, one would naturally leave the absolutely simple lines of the little church, and gain architectural effect in other ways than merely by length. For those who do not use a ritual and to whom the whole service must be distinctly audible, the only modification necessary would be the natural omission of any division between nave and chancel. This is a loss architecturally, but as it has for them no significance ecclesiastically, it would be obviously meaningless and therefore out of place if it were retained. Even with this loss the building would offer much opportunity and the length might be even more clearly accentuated. Constructionally, the simplicity of treating the narrow space is obvious.

To turn from plan to the treatment of exterior and interior: the early work, Romanesque or Norman, is full of suggestion for simple and inexpensive churches—the low walls, the round arch, plain or enriched, the steep pitched roof, open timbered, and the square tower are all forms which are within the abilities of workmen of modest proficiency and on the line of economical work. Even the ornament of this period, while requiring some architectural intelligence and sympathy in the workman, does not call for any great manual dexterity or nicety of execution.

The earliest Gothic was still simple in line, and depended much on clean-cut mouldings, thus requiring better materials and workmanship, and the shafts were often of such dimensions as to require some such material as marble. To many this early Gothic work seems to combine, with the simplicity of aim of the earlier work, a refinement and a directness of constructional effort which the early lacked, and which in the latter was so overlaid with ornament, and carried to such an extreme constructionally, as to be often but a *four de force*. Still, this latter work was very beautiful, and as it grew more and more elaborate it gave in beautiful tracery of openings, and in carving, still greater opportunity to the artificer and master builder, and there followed the development of tower and spire, porches and other accessories, such as cloisters, chapter houses, side chapel, &c., all of which gave opportunity to the architect.

All of these periods abound in fine open timber roofs; vaulting, so common in the cathedrals and in small churches abroad, not being common in England. In this, again, England gives us the best examples, as timber roofs, with the proportionally lighter walls which carry them, are more within reach of the means ordinarily at our command.

Such is in brief an outline of the Gothic periods in England. Then came the days of the Italian Renaissance and the revival of the love of the classic, and this—in a thoroughly English way—touched England, too, and promised much for the future; until the Reformation, shaking the Church to its foundations, and scorning the old things, brought church building to a standstill. When at last it began to move again it was on purely classic lines, and the churches were tinged, if not quite controlled, by the influence of a somewhat narrow Protestantism, and a bigoted dislike for all that was associated with the older forms of worship. It is not until our own generation that anything on the lines of the early work has been done.

While studying and drawing lessons from each period of the gradual advance, it would seem to me most natural and fit, that once one had passed the limit of the mere copyist—a point at which none of us would wish to stay, but through which all pass—one would take up the work where it reached its culmination.

Just here would be a natural and right opportunity for individual judgment, and for the

display of that individuality which will mark every true designer. One may feel that the Romanesque, either in its Norman phase, or finding its perfection in the southern country of its birth, is the true expression which may be developed into a perfect and complete style. Another may find his ideal in the severe and simple work of the early thirteenth century; while yet another may wish to make the sixteenth century his starting point, gathering up the best of the preceding four centuries and adding the enthusiasm of the new learning and the revival of the love for the Classic which touched all the work of that brilliant century with its glory. Each period has its admirers and supporters, and each has unquestionably its special claim to consideration. But the whole period is full of architectural life and vigour, and is one which no one can afford to pass over. We are apt to consider ourselves eclectics in these days, and yet I think the study of the work of the Middle Ages is very generally neglected.

To return again to the plan and its various sub-divisions. The next distinctive feature of the medieval churches is the division of the building into chancel crossing, transepts, nave, and aisles. Whatever may have been the origin of the cruciform, this one thing is certain, that for all these peoples it signified the Cross which, except in the very earliest days, has always stood the foremost symbol of the Faith. The aisles signified the Trinity. Besides these more obvious symbolism, the chancel represented the Church triumphant, the nave the Church militant, or the new and the old dispensation. The chancel was further divided into sanctuary and choir, the one for the celebration of the Holy Eucharist, the other for the due rendering of the service. The sanctuary was fitted with altar, credence, piscina, and sedilia, and the choir, besides stalls for clergy and choir, had lectern and pulpit. Side aisles contained side chapels and chantries, for daily or special services, and in these latter and also in the chancel, or chancel aisles, there were tombs, some of which were in themselves objects of veneration as the last resting-places of saints.

All of these things represented some distinct phase of faith—the altar the real presence of the Lord's Body—the choir, the need of orders, and ritual—chantries, prayers for the repose of the souls of those who had died in the faith. In so far as these beliefs are represented by these forms to-day, just so far and no farther are they fit forms for us to use. To all Christian bodies the cross is still the great symbol, and the cruciform is ecclesiastically admissible and architecturally a boon. To the great mass of Christians the Apostles' Creed is the utterance of their faith, and to them an expression of this faith in three-fold nave and aisles is fit and right. The chancel, with all its appurtenances, altar, sanctuary, choir, stalls, desk, &c., unfortunately belongs only to those whose ritual requires these things, but where they are absent there is at least no reason why the minister's platform should be lifted up like an hotel parlour. Such opportunity as there is for dignity and reverential treatment should certainly be seized. Side chapels in a church whose service is said daily to a comparatively small number are in place and a most useful addition. Chantries are practically antiquated, for prayers for the dead, where used, are not said in private by a priest paid for the purpose.

So much for the circumstances under which these forms may be rightly used; one word about the use of the form where the belief does not justify it. The architect who takes forms which have an ecclesiastical significance and origin, and uses them as artistic accessories where they have no significance and where the faith they mutely express are not believed in, is acting the part of a charlatan and playing upon the ignorance or carelessness of his clients. Even if his clients are willing to accept these things it is an injustice to those to whom the forms belong in their entirety. Truth is the basis of architectural right and wrong. When medieval buildings used nave and aisles, chancel, sanctuary, Lady chapel, and chantries, they represented vital forms of faith or served actual uses. Let us be equally true to-day and embody in our churches only what those churches profess; provide not for medieval uses, now abandoned, but for modern needs.

Such, in the main, are the chief features of the old churches, which as they answered needs similar to ours, may be fitly followed to-day. There are other needs which are the

outcome of growth and the advance of civilisation, with which they were not called upon to grapple and which we must solve for ourselves.

First, to finish with isolated or country churches, before touching on the city problem, we need more or less ample accommodation for the clergy, for the choir, for the children's school, for the gathering of the various lay bodies who help in the great church work. For all these the old buildings give practically no precedent. Occasionally a vestry, a sacristy, or an aumbrie was attached to the chancel. Even these were largely removed in Reformation days. There is, however, one rather apt lesson which the English ecclesiastical architects did most clearly teach, and that is, that if a need exists, the simplest and most direct solution is generally best, and if a place for a priest to vest was needed they put a room of the necessary size where it was most conveniently placed for use, and this done, they found its architectural treatment practically settled.

The modern plan which one sees so often followed is to take some hard-and-fast, well-balanced scheme, and let the morning chapel balance the vestry, the porch balance a lavatory, and a baptistry balance a room for mothers' meetings. This sort of thing may work well for large classic buildings and sometimes seems the essential note in such plans, where the regular balance of parts, and the relation of parts to the whole, are necessary to the design; but with churches it is somewhat different, the width and length of chancel have never had any fixed relation, nor has any such existed between nave and aisles, and the meaning and use of the various parts of the building have been a gradual natural growth, responding to need, and fulfilled by a skill which was steadily improving. Such a growth cannot be reduced to a system—such symmetry as exists is occult rather than obvious.

It may seem begging the question to thus pass over without comment churches built on classic lines, but I have for lack of time been obliged to confine myself to one country—the one from which I believe we can learn most—and notwithstanding Wren's prolific production of semi-classic work, I do not think that either Wren or his followers have left a lasting mark on ecclesiastical architecture. Not a church rises in England to-day on the line of his work, while hundreds are following the lines of thought so rudely interrupted by the troubles of the Reformation. Nor does it in any way follow that the bodies who date only from the Reformation should hold to the models of chapel and meeting houses which were erected by their ecclesiastical forefathers, for we see clearly enough now that these men in the over-zeal of reformers, a zeal which we cannot but admire, overthrew much that was beautiful and lovely and of good repute, and which was fit to make the service of God more reverent, and more worthy. The barren meeting houses, and despoiled and white-washed churches are a warning, not a precedent.

When we turn from country to city churches we find ourselves confronted by wholly different problems. We have seen churches, built on the old plans, gradually surrounded by buildings which press in around them, crowd and overshadow them, until one must feel convinced that the solution has not been reached. In the country one can build low nave and aisles and thus emphasise the height of spire and tower, but of what use is this in a city where an office building, or even a ten-story apartment will throw the spire into the shade and make the nave seem but a hovel? Even where the church, long established, has grounds about it and is thus saved from absolute encroachment, it is fairly evident that the building is an anomaly or an anachronism.

The natural way in which the city church presents itself to my mind is that it must conform to a city lot, generally narrow and deep, and lighted on two ends only. With low naves and high towers and spires ruled out as already noted, we have still left our early distinguishing feature of length, and the question of lighting length with outside light is at once answered by adding aisles to nave and depending on a lofty clearstory. The necessity for the important clearstory naturally suggests that in length and height of nave we shall find the best solution of the city church. We have given up nothing of essential ecclesiastical precedent or character in the interior, and in the exterior we confine ourselves to a single fine façade (or



perhaps two if the building runs from street to street).

This seems to me the most obvious way of meeting the requirements of a city building, and gives ample opportunity for beauty; a great west window with lofty rising lines may well seem to have the dignity and beauty of aspiring height, and yet not challenge comparison with even a twenty-story building.

For such buildings the continent, especially France and Belgium, furnish us the best precedents. French cathedrals and churches seem to one fresh from England immeasurably lofty and sublime; and the people of the Netherlands were fully alive to the value of narrow and lofty fenestration—often further emphasised by mullions so light as to seem scarce capable of sustaining their height.

A noted English architect once said to me, 'If you have height, do all you can to emphasise it and make it tell, and if you have length let every line tell of length.' This, to my mind, is the keynote in church building. If you can have all the dimensions heroic like Amien, well and good; but if you have opportunity for but one, make the most of that.

Finally, no notice of ecclesiastical architecture, however brief, would be justified in passing over without comment the work which has been done in the present century. In the early part of the century, church building was at its lowest ebb—hardly a building of any importance or merit was erected; but with the forties and fifties men began to inquire as to the wisdom of our forefathers in ruthlessly destroying or casting out what was beautiful. The church alone seemed to be separated from what was lovely. With the revival in England of the study of church doctrine came the revival of the study of church architecture. Cathedrals and parish churches were repaired and restored (sometimes we could almost wish these early enthusiasts had not done this); engravings and measured drawings were published, a general interest awakened in the many arts which were crushed by the zealous reformers.

Out of these studies and inquiries came, in England and here, men who understood the old work and loved it—who loved what it meant, and who thus loving could put new life into it. Previous so-called Gothic revivals had been attempted with ghastly results, but with Pugin and Sedding the lost arts of the sixteenth century received new life, and now there are a number of vital designers in England, and not a few here, who have studied the old work with reverence, and who can design and build in the spirit of the earlier days.

Do not run away with the idea that I am a medievalist. I have no wish to return, even in thought, to days which were so far less full of opportunity than these, but I am fully persuaded that we in this country are so much accustomed to looking, to straining forward, that we do not study sufficiently and try to learn from what lies behind or even about us.

It is good sometimes to drop the rush and the bustle of our hurrying life and just take at least a glance behind to assure ourselves that our progress is really forward, and that in our eagerness for novelty we are not wasting time in studying problems which have been solved and settled long ago."

#### COMPETITIONS.

WELL'S BLUE SCHOOLS, SOMERSET.—Designs for a new girls' school by Mr. H. Dare-Bryan, of Bristol, have been selected in a limited competition by the Governors of this foundation and approved by the County Council Education Committee. A cookery room is included in the scheme, and the schools will be erected in Portway, close to the famous tower of St. Cuthbert.

#### BOOKS RECEIVED.

LESSONS FROM FIRE AND PANIC.—By Thomas Blashill (The British Fire-Prevention Committee).

DEVON AND EXETER ARCHITECTURAL SOCIETY. Mr. Harbottle Reed, Hon. Secretary of this Society, has sent us the following communication:—"Re the Tavistock-road Competition: 'The attention of the Council of the Devon and Exeter Architectural Society having been called to the published correspondence between the architects of Plymouth and the Corporation, upon the above, a resolution was passed approving of the action of the local architects, and expressing regret that the Corporation were unable to accede to their suggestions.'"

#### ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

AN Irish district meeting in connection with the Association of Municipal and County Engineers was opened in the Municipal Offices at Cork on Friday, August 5. Mr. O. Claude Robson, Willesden (President), occupied the chair, and amongst those present were Messrs. T. Cole (Secretary), Westminster; R. H. Dorman, Armagh (Irish District Secretary); J. W. Wardle, Longley; H. W. Cook, Lancaster; A. E. M. Beath, Sale; C. Botterill, Fulham; R. W. Longfield, Donegal; C. O. Lyons, Cork; M. J. Buckley, Drumcondra; J. Smith, Ballinasloe; J. Horan, Limerick; H. A. Cutler, Cork; M. J. Fleming, Waterford; and others.

The Mayor of Cork (Mr. P. H. Meade), in welcoming the Association to Cork, said that the members as a body represented a class of professional gentlemen the importance of whose work it would not be easy to overestimate. In their hands the health and happiness of the citizens of the various districts of the country largely rested.

The President, in acknowledgment, thanked the Mayor for his kind reception.

Mr. R. H. Dorman, Armagh, was unanimously re-elected honorary secretary for Ireland.

Mr. H. A. Cutler, Assoc. M. Inst. C.E., City Surveyor of Cork, then read a paper on "Restoration of Municipal Buildings, and Description of Cork Waterworks." He said that in 1889 the Corporation purchased the Corn Exchange, which, by alterations and additions, was made suitable for the requirements of the city. The roof of the old building was removed and an upper floor, carrying the council chamber and other offices, constructed on girders and columns over the ground floor, which was used as a vestibule. Before the work was completed serious settlements occurred in both wings, and within a very short time after completion the openings had to be braced and various temporary measures adopted to prevent accidents occurring. In 1890 he was instructed to report to the Town Council on the state of the buildings, and the work necessary for restoration. On surveying the buildings the concrete foundations of the wings were found to have insufficient spread and to be too thin for the weight they carried, as evidenced by the longitudinal cracks in the concrete under the walls; they were also laid practically flat on the surface of the ground, without more than about 6 in. of excavation. The foundations of the old walls, to which the new work was bonded, were on a bed of gravel 17 ft. below the floor line, and the ground above the gravel consisted of about 10 ft. of blue mud, surmounted by about 6 in. of filling. The walls of the new wings, which were rough rubble plastered externally with cement, were found to have sunk 6 in. in the middle of their length, the ends being suspended from the old walls, in which they were bonded. Large and dangerous cracks were found in all the new work, some of the relieving arches had dropped out of the floors, and roofs had followed the sinking of the walls; some of the old walls were cracked with the extra weight caused by the new walls being bonded into them. The two central columns in the vestibule supporting the girders under the Council Chamber, had sunk about 1 in., and were considerably overloaded while the girders which they were supporting were strained to their elastic limit, and the joists of the Council Chamber floor were only about half the necessary strength. After considering the cost he reported to the Council that it would not only be considerably cheaper to underpin the walls and raise the floors and roof than to pull down and rebuild, but that the work could be done without turning the officers out of the building. The estimated cost of underpinning and restoring the building to its original condition was 2,000*l.*, and the cost of the work had been little, if anything, over the estimate. In deciding to underpin, the only doubt in his mind was whether the pumping of the water with which the ground was charged would cause further settlements before the foundations could be put in, and it was only by the exercise of the greatest care that failure was avoided. The underpinning was done in lengths of about 9 ft. with cement concrete, one 9 ft. pier being built under the centre of the length of each wall before any other holes were sunk. When a central pier was com-

pleted holes, were sunk for piers on each side simultaneously, thus leaving alternate bays standing on the original foundation. In making the excavations the ground was first cleared to the under-side of the original foundations, and two trenches cut at right angles to the wall about 6 ft. apart, deep enough to get steel needles under the concrete. The needles were 12 by 6 rolled joists, 12 ft. long, supported at their ends by half timbers about 10 ft. long, laid in trenches cut parallel to the walls. When the half-timber sleepers and needles had been placed in position and wedged up, the ground was excavated on one side of the wall only for the length of the intended pier, about 3 ft. 6 in. wide, and 5 ft. below the under-side of the old concrete. The ground under the walls was then excavated. The height from the finished concrete foundations to the under-side of the girders was 13 in. greater than the length of the stanchions, and when the stanchions were put in position they were wedged up tight to the under-side of the girders by driving iron wedges between the concrete and the base plates; a bank of clay was then formed all round, about 3 in. from the wedge of the bare stanchion, and the space grouted with neat cement. When the grout had set, the iron wedges were drawn, and the holes filled up with cement. When the foundations were completed and the building was considered secure, the floors and roofs were jacked up to their original position. Mr. Cutler then proceeded to describe the water supply of the city. The water is pumped from the river Lee into two reservoirs. The high-level reservoir had a capacity of 721,500 gallons, and supplied water to 17,760 persons, while the low-level reservoir had a capacity of 3,404,000 gallons, and supplied water to 68,529 persons. The total pumping capacity was 403,767 gallons per hour, but with the exception of the two new American turbines, the whole of the pumping plant was wasteful and obsolete. The water at the intake was a good potable water, containing only 4.5 degrees of hardness, and was an excellent water for domestic purposes; but in times of heavy rainfall large quantities of peat and decayed vegetable matter were brought down the river, causing great discoloration and deposits in the reservoirs, mains, and services; at the present time plans were being prepared for the erection of filters, which when completed, would no doubt relieve the minds of the consumers from the uneasiness always felt when drinking water was discoloured. The daily quantity of water supplied for all purposes in 1890 reached the enormous quantity of 71 gallons per head, with the result that the higher portions of the city were entirely without water except during the night and early morning. Early in 1897 the most strenuous exertions were made to prevent the waste of water, with the result that at the end of the year the water supplied to the city for all purposes had been reduced to 48 gallons per head. The Deacon meter system was introduced with satisfactory results; and an adequate staff of inspectors was engaged in inspecting house services and serving notices. The valves were tested with the stethoscope, and noisy valves located. The principal difficulties now encountered in further reducing the waste was the inadequacy of the service pipes and house fittings to withstand the increased pressure in the mains.

Mr. W. H. Hill, Cork, said that before Mr. Cutler undertook the restoration of the Municipal Buildings, the walls were in such a damaged condition that he almost thought any restoration hopeless, but by patient work Mr. Cutler had succeeded in carrying out the work efficiently and well.

Mr. Cooke, Lancaster, said he had used the Deacon meter at Lancaster with equally satisfactory results in preventing the waste of water.

Mr. Kirkby, Cork, said that the whole of the city was built on more or less treacherous ground, and with large buildings much care had to be exercised in securing proper foundations.

Mr. Fleming, Waterford, said he considered the present consumption of 48 gallons of water per head was most excessive, for in Waterford the consumption did not exceed 27 gallons. He approved of the Deacon meters, which he had in use in Waterford.

On the proposition of the President, a vote of thanks was accorded to Mr. Cutler for his paper.

Mr. B. Griffin, A.M. Inst. C.E., Cork, then read a paper on the "Cork Electric Tramways." He



said it was worthy of note that the Cork Company was the first in the British Isles supplying electricity for traction and lighting from one central station. The tramways were for the most part single lines with passing places, and the length of track was eleven miles. The gauge was 2 ft. 11½ in., and was determined with a view to the probable use of the tramway for conveying the trucks of the Muskerry Light Railway Company to and from the quays, and for interchange of traffic with the Cork and Passage Company. The rails were of the girder type, weighing 8½ lbs. per yard, and were of American manufacture. The steepest grade was one in 14, and the sharpest curve was 27 ft. radius. The rails were laid upon a continuous bed of Portland cement concrete, 6 in. deep and 7 ft. wide. The roadway was paved with Welsh granite setts, 6 in. deep and 33 in. wide, laid on a ½-in. bed of sand and grouted with Portland cement mortar well swept into the joints. The power station was fitted with three tandem horizontal condensing McIntosh & Seymour engines directly coupled to 220 kilowatt generators, running 150 revolutions per minute. The three boilers by Babcock & Wilcox had each 2,531 square feet of heating surface, and are capable of evaporating 8,000 lbs. of water per hour. The battery room contained 256 Tudor cells, capable of discharging 110 amperes for seven hours. The chimney was of steel, 130 ft. in height, and the advantages claimed were saving of time in erection and cost in the structure. The saving in cost over a brick stack was about 25 per cent. The cars were built to carry forty-four passengers. Span wires would only be used in one or two instances where there were double curves in the street.

Mr. Cutler expressed the opinion that it was preferable to grout the setts for tramway paving with pitch rather than with cement and sand.

After further discussion, a vote of thanks was accorded to Mr. Griffin for his paper.

Mr. R. H. Dorman, M.Inst.C.E., County Surveyor of Armagh, then read a paper on "Main Roads under County Councils in Ireland." He said the meeting afforded a fitting opportunity for referring to the future management of county works in Ireland. The network of roads, maintained with efficiency and economy, which covered the face of Ireland was a record of the signal success attained by the Grand Jury system. So many circumstances and conditions would have to be considered in different cases, that it would probably be impossible for any County Council or Surveyor to lay down any hard and fast rule. He would, however, consider the case of County Armagh. In that county the roads were classed as first, second, third, and fourth class. The cost of the first class averaged 41½. 15s. per mile annually, the second class 15½. 5s. per mile, the third class 9½. 5s. per mile, and the fourth class 8½. 6s. per mile. Now for that county he suggested that a road which was a main artery of the county, over which the public travel for divers purposes, and which had for the previous three years cost on the average 24½. per mile per annum to repair, should be termed a main road, and the expense of maintaining it should be levied half off the county at large. It was quite possible that some County Councils might decide to declare all county roads main roads, and other counties might refuse to declare any roads main roads, but he considered that either of these views would be unreasonable. As regarded the future maintenance of roads in that country, he thought the general opinion among County Surveyors was that the most economical method of maintaining the by-roads was under the contract system, but that for the main roads contracts should only be entered into for the supplying of material, and that the rest of the work should be carried out by the Surveyor's own staff. He was for a long time in favour of the contract system, but he had in recent years completely changed his opinion. He would leave it an open question whether the County Surveyor should raise his own material or whether a contract should be entered into for the purpose. In conclusion he pointed out that the conditions under which traffic was being conducted in Ireland had to some extent changed during recent years, and further changes in this respect were imminent. Tourist traffic was being largely developed, and myriads of cyclists were inundating the country; the traction engine was making its appearance, and they might look forward to see light carts superseded perhaps by motor cars.

Mr. J. Horan, Limerick, said he would put the whole cost of the maintenance of main roads on the county at large, instead of one-half of the cost as suggested by the author of the paper.

Mr. Longfield, Donegal, said he looked forward with some apprehension to the action of the new authorities, and the probable attitude of the District and County Councils towards each other.

Mr. Kirkby, Cork; Mr. Lyons, Cork, and other County Surveyors, took a brief part in the discussion, at the close of which a vote of thanks was accorded to Mr. Dorman for his paper.

At the conclusion of the business proceedings the members of the Association were entertained at luncheon by the Mayor (Mr. Meade) at the Victoria and Great Central Hotel.

The Mayor, in proposing the toast of "The Association of Municipal and County Engineers," coupled with the name of the President, Mr. Robson, said the aim of the Association was to raise the tone of the great profession to which the members were connected, and at the present time, when they saw such progress and improvement in sanitary science and engineering, it was peculiarly gratifying to welcome the members to Cork.

Mr. Robson, in responding, said the primary reason for the holding of these meetings was the diffusion of professional knowledge, the gaining of additional experience by intercommunication of ideas, and the reading of papers. During the past thirty years the duties of municipal engineers had enormously increased, and not only the health of the community, but the judicious expenditure of much public money, depended upon municipal engineers. In conclusion, he proposed the health of the Mayor and Municipality of Cork.

The Mayor responded, paying a high tribute to Mr. Cutler, the present City Engineer.

The members then visited the Electric Light Company's central station in Albert-street, and other works in course of construction, and afterwards proceeded to Blarney and St. Anne's, where they were entertained to tea by Mr. R. Barker, J.P.

On Saturday morning the members assembled at the Municipal Offices and drove to Tipperstown, the site of the Queenstown Waterworks. On arrival at Queenstown, the local members of the Association entertained their colleagues to luncheon in the Queen's Hotel. Mr. Kirkby presided, and was supported by Mr. Robson and the other members of the Association. In the afternoon a cruise was made round Cork Harbour, with visits to the harbour works and the Cork, Blackrock, and Passage Railway extension to Crosshaven.

#### THE NEW LUNATIC ASYLUM AT BANGOUR.

THE Edinburgh and District Lunacy Board met on the 28th ult., and after considering the reports by Mr. W. H. Robertson, of H.M. Board of Works, assessor in the competition, and Dr. Robertson, of Murthly, of Perth District Asylum, and Messrs. P. Lawrence & Co., surveyors, appointed Mr. Hippolyte J. Blanc, R.S.A., to be architect for the new asylum, and awarded the following premiums:—First premium (250l.) to Messrs. McArthur & Watson, Edinburgh; second premium (200l.), Mr. William Eaglesham, Ayr; third premium (150l.), Messrs. Thomson & Sandilands, Glasgow; fourth premium (100l.), Messrs. McGibbon & Ross, Edinburgh. Under the conditions and instructions to architects it was provided that whatever architect was placed first by the assessor should receive the appointment, and that among the other competitors there should be distributed in addition four money awards in the order of merit.

The characteristic aimed at by the successful architect in the outward treatment of the designs is variety of expression, consistent with the internal requirements. The administrative block is placed in the middle of the medical and hospital blocks, near the localities to be served. The porter's house is placed at the back, with separate access and staircase, but with through communication to the main building. The plans of the kitchen block provide for the requirements, and show all the fittings and apparatus requisite for cooking for 1,000 patients and 200 officials. Bedroom accommodation for cook and assistants is also provided within the block. The stores block and the kitchen block are attached, and have through private communication. An abundance of lighting is afforded by means of continuous cupolas of clearstory sidesashes, with opening frames for ventilation, under simple and easy control. The church is designed to meet the requirements of Presbyterian or Ritual service as may be desired.

The recreation hall is placed almost in the centre of the whole site. The floor area is unobstructed by

pillars, and provision is made for stage and dressing-room requirements. At the main entrance are two cloak-rooms, and for an increase of accommodation a gallery can readily be constructed over the recess between the two vestibules to hold 130 persons. There are four doors of access, any two of which can be for males, and two for females, if desired. In treating the exterior of the hall one of the vestibules has been designed to carry a lofty tower. In that tower it is proposed to place tanks of 30,000 gallon capacity, wherein water may be stored for the general service of the several blocks or for the washhouse, and also as a supply for fire hydrants. Above these is a clock chamber. The bath-house is lighted from clearstory windows. The mortuary block is planned upon the lines of the best-equipped mortuary in this country. A special addition shown upon the plans is a duplicate mortuary for the sexes, a dissecting-room, and a refrigerator. The situation of the mortuary has been specially considered. It is comparatively near the hospital, and from it bodies may be removed outside the precincts of the colony without observation by any inmates. The laundry block is quite close to the kitchen and store block. As in other blocks named, the natural lighting here is by continuous upright glazed cupolas. The boiler and engine-house block immediately adjoins the store block. The dynamo-room is of ample space to admit of an increase in the number of dynamos, and also to afford space for storage batteries. The bakery is designed to meet the requirements of 1,200 people. The workshop block is attached to the engine-room block. It forms in its complete condition three sides of a courtyard. The nurse's house is placed at the extreme west end of the site. Special accommodation for a matron is also provided. The medical superintendent's house is placed within easy reach of the main entrance. The attendants' cottages are planned for varying accommodation of three and four apartments. Those of three apartments have no separate bath-room, while those of four apartments have. The series is designed with a view to picturesqueness, without unnecessary ornamentation, but with sufficient form to give them architectural interest. The infirmary and sick-room blocks complete the group fronting the high land on which the medical section is placed. The hospital block is so arranged that one side or half is a counterpart of the other. The kitchen is arranged in the middle. A doctor's room is also provided. A feature of the plan is that at the ends of the wards are two single rooms, one of which is for a moribund patient who, after death, can be removed by the outside door of the room without having to be conveyed through the ward. The arrangement has received careful consideration to secure separation of sexes, and easy communication throughout upon an economical form of construction.

The asylum houses are arranged to supply the accommodation required, and variety is sought to be gained by varying the areas and consequent accommodation of dormitories in the several blocks. For the industrial or non-medical section ten separate schemes for villas are submitted—five for men and five for women. The aggregate number of 150 of each sex has been divided as follows:—One villa of 25, one of 26, one of 28, one of 32, and one of 40 patients.

Fire hydrants and hose chambers are provided for in every block at convenient places in the corridors or in staircases. No special fireproof construction is contemplated. There is comparative immunity from fire risks by the isolation of the different blocks. The lighting is proposed to be by electricity. The ventilation of the various dormitories and day-rooms is provided for by means of fresh-air inlets in the window recesses at the floor levels, under key control of the attendants. Radiators are proposed to be placed in the window recesses, so that in winter the incoming air would be warmed, while in summer the air would be admitted by the same openings in a natural state. For the release of vitiated air grated openings are proposed to be placed in the walls near the ceilings, and led in specially-constructed glazed brick flues into an outlet shaft and ventilator in the roof. All windows are intended to open, but by means of a small brass bracket permanently screwed to the case the extent of the opening is limited to about 7 in. The cost of the building, to accommodate 1,000 patients, is set down at 235,000l.

GLASGOW ARCHITECTURE.—In reference to our recent article on Glasgow architecture, Mr. Burnet asks us to state that the work imputed to him was done by the late firm of Messrs. John Burnet, Son & Campbell. The mistake was due to the title on the drawings sent in by Mr. Burnet.

QUEEN'S CLUB GARDENS ESTATES.—A company is about to be formed to acquire and develop for residential purposes the freehold of Stanwick-mansions (comprising three blocks of ten flats each) in Stanwick-road, West Kensington; the St. John's Lodge Estate, North End-road, Fulham; Queen's Club-gardens (thirty-four blocks of flats), and some adjacent property in Normand and Musard-roads. The various properties were built by the vendor, Mr. W. H. Gibbs, who fixes the purchase-money at 485,000l.; the present gross rentals amount to 30,819l.



## Correspondence.

To the Editor of THE BUILDER.

## APPOINTMENT OF ARCHITECT, UNION WORKHOUSE, SALFORD.

SIR,—We have had our attention drawn to a paragraph in your issue of the 30th ult., referring to the appointment of architect recently made by the Salford Board of Guardians.

A few weeks ago we received a communication from the Board, intimating that we had been nominated as architects experienced in work of this class, and inviting us to an interview as candidates for the appointment. A circular note was sent to us stating that the Guardians were prepared to pay the architect selected, 5 per cent., but that he would be required for that payment to provide the quantities, and give all necessary superintendence, and to perform all the duties of surveyor as well as architect. The Guardians, as you state, met on the 22nd ult., and we decided to attend for the purpose of entering our strong protest against the proposed terms, pointing out that it was neither in accordance with usual custom, nor with the schedule of charges recognised by the Royal Institute of British Architects. We definitely refused to accept their terms, as did several other of the seven architects whose names had been selected, pointing out that no architect should be invited to undertake a large work of this kind on insufficient remuneration; but our protest was of no avail, as three of the architects gave way on the point.

Such conditions of payment are not in accordance with the schedule of the Royal Institute of British Architects, nor such that any responsible architect should have placed before him to take or leave, especially in the manner in which it was done by the Salford Board of Guardians.

A precedent of this kind will, no doubt, be eagerly seized upon by public bodies, but if a stand were made by representative societies and the position fairly stated, it would be understood that architects of good standing will not undertake to combine architects' and surveyors' work at 5 per cent. or any other insufficient remuneration.

The architect does not only stand as an employee, but quite as much as an independent adviser and arbitrator. To assume this position he must be properly paid, and his standing must be a professional one and not only that of a man of business.

THOS. WORTHINGTON.  
PERCY S. WORTHINGTON.

## HYDRAULIC RAM PROBLEM.

SIR,—Will any reader who understands water supply by means of hydraulic rams kindly assist me with the following problem?

I have a spring, situated at the side of a burn, and about 3 ft. above bed of burn, yielding  $2\frac{1}{2}$  gallons per minute.

The spring is not on my own property, but I can get way-leave for a pipe. The ram is to be put at the side of the burn on my own ground, and about 225 yards from the spring. As the burn sometimes comes down in heavy spates, the ram will be kept 3 ft. above the bed of the burn.

I purpose using a 2-in. cast-iron pipe. This size will allow for any bring-up which may take place. The fall on the distance from spring to ram is equivalent to fall of burn, viz., 20 ft., measured vertically.

The height to which the water is to be raised is 55 ft. vertical, and the length of delivery-pipe, which can be made any size, is 60 yards.

The question is, Can so long a drive-pipe (225 yards) be employed to drive a ram direct, or must I construct a tank to deliver the water into, and use a shorter drive-pipe from tank? What type of ram should be used, and its dimensions?

W. T.

THE NORWICH FIRE.—The Edinburgh public-house, Norwich, situate at the corner of the block where the recent fire raged, had withstood the devastation on either side, and had been temporarily shored up. The adjoining buildings were destroyed, but the public-house was not considered unsafe, and business was conducted as usual. A few minutes before six o'clock on the 3rd inst. the house suddenly collapsed. Only two persons were inside at the time—the woman in charge and a little girl. The latter escaped, but the woman was struck by the debris and hurled into the cellar, sustaining a compound fracture of the leg. Two men working in the adjoining ruins were buried, but were extricated by the police.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—VII.

THE VELOCITY OF SOUND (continued).

WE have already alluded to the velocity of earth-waves in solid substances, such as granite and sand; and it may be taken as granted that, as a general rule, the elasticity of solids as compared with the density is greater than that of liquids, and consequently, that the propagation of sound in the solids is more rapid.

Turning to the velocity of sound in woods of different kinds—an important phase of our subject—it is found that pine does not permit such high velocity as oak, the former yielding an average result of 10,900 ft. per second and the latter 12,600. On the other hand, even oak does not give such a high velocity as cedar, elm, ash, fir, or walnut, the figures for the last mentioned, which yields the highest results, being 15,740 ft. per second. The structure of the wood—the disposition of the cells, aggregate cells, and cell fibres—is, no doubt, mainly responsible for this. If the sound in the interior of a building were purposely propagated through wood, the figures quoted would have more real force for us; but, seeing that sound is generally directed against the wood, as when this latter substance forms the linings of walls, the floor, ceiling, &c., problems connected with reflection and absorption to a large extent usurp those more directly related to velocity.

The velocity of sound is slowest in such substances as caoutchouc, 150 ft. to 200 ft. per second, and rises highest in such as wrought iron and cast steel, 16,500 ft. per second. The velocity is not so high in lead, gold or silver as in the woods mentioned, but these latter yield lower results than glass or steel wire. In the case of wood the velocities are greater along the directions of the fibres than across or along the rings.

The velocity of sound in solids and gases can be readily determined by a very simple apparatus invented by Kundt. Atkinson describes it as a glass tube about 2 yds. in length and 2 in. in internal diameter, closed at one end by a moveable stopper; the other end is fitted with a cork, which tightly grasps a glass tube of the same length, but of smaller diameter. This is closed at one end by a piston, which moves with gentle friction in the outer tube. Then, by rubbing the free end of the smaller tube (that portion of the piston rod outside what may be called the cylinder) with a wet cloth the tube produces longitudinal vibrations, and these transmit their motion to the air in the larger tube. If this latter contains some powdered cork this is set in active vibration by the longitudinal vibrations alluded to, and the powder arranges itself in small patches some distance from each other, and in a definite order, the nature and arrangement of which depend on the vibrating part of the rod and the tube.

Now, as the velocity of sound in any body is equal to the wave-length in that body multiplied by the number of vibrations per second, it is not difficult by the apparatus described to ascertain the velocity. For the little patches of powdered cork referred to represent nodes, and the mean distance between them can be measured with great accuracy; it represents the distance between two nodes or half a wave-length—the wave-length of the sound in air. In regard to the method of determining the number of vibrations per second, we must give particulars as to that in another connexion later on, but the student will see that by determining that, and with the factors already ascertained, the velocity of sound in air may be readily arrived at. By a simple stopcock arrangement different gases may be introduced instead of air, and it will then be found that the powdered cork on being vibrated as before will arrange itself in different lengths or distances apart from those which were ascertained in air, and these lengths will differ with each gas.

The student will have noticed that the small tube (the piston-rod, so to speak) in the above instrument is made of glass, and that it was this which, on being rubbed, produced the longitudinal vibrations. It will be evident, therefore, that if we vary the substance of this rod we shall get corresponding differences in the longitudinal vibrations, and correspondingly different results in the lengths of the segments made by the powdered cork. In this way the velocity of sound in various solids can be determined by the same apparatus. Atkinson

records the velocity in steel as 15,740, and in brass as 10,870 that of air. Of course, the velocity in air is taken as the standard. This may be described as a graphic method of ascertaining velocity of sound, and it is capable of yielding extremely accurate results when the apparatus is properly adjusted. By modifications of the same instrument the velocity of sound in water contained in glass tubes may be ascertained; and by surrounding the tube with a jacket which can be raised to various constant temperatures by the vapours of different liquids, the velocity of sound in such vapours may be determined. In the case of metals tested it is highly desirable that the fibre should be ascertained and recorded, for, as will be readily understood from what has previously been said, the direction of the fibre is an important factor in transmitting velocity.

## SOUND-PROOF PARTITIONS.

To obtain a sound-proof partition in a building it is necessary to construct the bulk of the partition of a substance which offers the greatest resistance to the velocity of the sound. This is best effected by employing substances which conduct sound badly. The figures quoted in reference to caoutchouc will occur to the student in this connexion. We would refer to the last article where, if the respective figures be compared, it will be seen that the velocity is much less in certain common substances than in those ordinarily employed in building. At the same time, nothing of an ordinary nature beats caoutchouc for stopping sound. The earth-waves in wet sand, good material as that is, proceed at a velocity of 951 ft. per second, and Mallet shows that the velocity of the transmission of sound in wet sand is only 825 ft. per second. But even that cannot compete with the caoutchouc, which stands at 150 ft. to 200 ft. per second for velocity, and some experiments on old caoutchouc bring the figure down to 100 ft. per second.

It will be profitable at this juncture to again refer to the velocity of sound in air, which we know to be about 1,100 ft. per second at an ordinary mild temperature. The problem presented to us is to altogether stop this velocity, and consequently the propagation of sound. This can certainly be done by a thick sheet of caoutchouc, but there are very many reasons why that substance should not be used to any large extent in buildings—notably on account of conflagrations, and it is expensive.

Let us approach the sound-proof partition wall from another standpoint. We know that if a medium through which sound passes is heterogeneous in composition, the waves of sound are reflected on the different surfaces of each heterogeneous substance. The reflection from so many different points and the returns being given at such varying intensities (see previous articles for explanation of this), the different phonetic beams tend to neutralise each other, and so to enfeeble the sound.

Putting together what has been said in the last two paragraphs, it is evident that the sound-proof partition problem will be best solved by constructing the partition of loosely-compacted, fine-grained but angular fragments of the greatest variety of hard and soft substances mixed that can be found at a reasonable price. Minute pieces of cork, sawdust, grains of sand, shavings, cinders, and coke-dust might be mixed with granite sand, sand, slag-dust, and the like, but not compacted. We shall be greatly misunderstood if these heterogeneous substances are cemented in any way to form the wall; they need not even be rammed in very tightly, for the chief object in view is to cause the phonetic beams to be reflected and doubled back on themselves. If the wall be cemented throughout, it, of course, acts as a heterogeneous solid, which is better than an uniform solid, it is true, but not as good as looser materials of varying kinds. We all know of the old method of rendering walls and ceilings sound-proof by packing in sawdust or shavings; it is necessary to go a step farther, as we see, to get the best results, though given sufficient thickness the sawdust does well enough. Our object is to show that, where economy in space is a factor the other substances may also be used, and the wall need not be as thick as though sawdust alone were employed.

Of course, we are well aware of a large number of substances, mostly artificial stones and slabs, or chemically prepared saw-dust and the like, which are used in the making of walls said to be rendered sound-proof thereby, and we dare say that many of these substances are of much value. But all that have come



under our notice have either been of a fairly homogeneous character, or have been compacted or cemented into more or less solid blocks. About a fortnight since we were present at some experiments where a partition wall which turned out to be fireproof (as was anticipated) was also said to be sound proof. It was very evident, from a mere casual inspection, that the material was fairly homogeneous in composition, so we paid special attention to the non-acoustic property referred to, and found that it was not much more sound-proof than any ordinary 3-in. wall would be. It certainly would not stop musical sounds from penetrating, and we take it that that is one of the prime objects of getting a sound-proof partition—as in flats, for instance.

In regard to the construction of the facings of sound-proof partitions, there must, of course, be something of a fairly solid character. If wood is employed it is best, though more expensive perhaps, to line the walls with thin strips cut parallel with the direction of the grain. We do not know whether this is a novel idea or not, but it is a legitimate deduction from the results already detailed as to the influence of the grain or fibre of wood in conducting sound or determining its velocity. It is desired to conduct the sound not in the direction of going through the wall, but at right angles to it and parallel with the surface of the wall. The general tendency with such strips would be to conduct the sound upwards and downwards, and to prevent penetration through the ceiling or the floor, as the case may be, it would seem desirable to make the long, thin strips stop within an inch or so of the ceiling and the floor, and to line the spaces thus left with a kind of parqueting, the small pieces of wood being cut so that their outward faces were disposed diagonally with reference to the prime direction of the grain of the wood. These two strips of parquetry should act as "cut-offs" to the sound travelling along the long strips lining the main part of the wall.

The reason we speak of strips rather than broad panels of wood for the lining is because not only does the minute space between thin strips impede the travelling of sound, but the continuity of the cross-fibres is interrupted, and there is a corresponding interference in the propagation of sound, the principle of which has already been demonstrated in these articles.

#### OBITUARY.

**M. CHARLES GARNIER.**—We have already briefly mentioned the death, on Wednesday the 3rd, of this eminent French architect. The immediate cause of death was apoplexy complicated by some other complaints; but his state of health, and his much altered appearance, had long been a source of anxiety to his friends. Nevertheless, his great energy, and so impetuous his good spirits, that any one who had met him taking his part in the proceedings of the Institute, or serving on Technical Committees connected with the Government or the Municipality, would hardly have regarded him as a man whose life was in a precarious state. His unexpected death is a great loss to French artistic circles, not only on account of his artistic gifts, but also for his personal qualities—his unvaried activity, his kind and amiable nature, and his gift of humour. At the time when the Gold Medal of the Institute of British Architects was presented to him, we gave an account of M. Garnier's works and career, the main facts in regard to which may however be briefly summed up here. Garnier was born at Paris on October 6, 1829. In 1842 he entered the Ecole des Beaux Arts, where Hippolyte Lebas was his instructor, and at the age of twenty-three gained the Prix de Rome. He made use of the money accruing from this scholarship to travel in Italy and Greece in company with Edmond About, and visited Constantinople in company with Théophile Gautier. In 1851 he was commissioned by the Duc de Luynes to make studies for restorations of the town of the Angevines in Naples, Sicily, and Calabria. On his return to Paris, in 1854, he was entrusted with the restoration of the Tour St. Jacques. In 1860 he was appointed architect to the City of Paris, and in 1861 entered into the great competition for the Paris Opera House, when his design was unanimously selected, and at once became famous. He devoted several years of strenuous and unremitting labour to carrying out the building—in which, as in the case of one or two other great buildings in Paris, great and unexpected difficulties were experienced in the foundations—and had the satisfaction of seeing the façade of it inaugurated in 1867. After this, the overseeing of the decoration of the building occupied most of his time till 1875. He was Honorary and Corresponding Member of no less than seventeen foreign Academies, and was, in 1874, elected a Member of the Académie des Beaux Arts, in place of the late Victor Baltard. In the following year

he was appointed architect to the Conservatoire; in 1864 he was created Chevalier of the Legion of Honour, was promoted to be "Officier" in 1875, "Commandeur" in 1880, and "Grand Officier" in 1895. Among his principal works, in addition to the Opera House, may be mentioned the Theatre at Monte Carlo, the Observatory at Nice, the new Circus, the "Cercle de la Librairie," and finally, at the Exhibition of 1889, the remarkable series of historic reconstructions of the human habitation of different eras, which extended along the whole front of the Champ de Mars, illustrating various types of habitation, from the cave to the French Renaissance "maisonnette." The historical value of the exhibit was over-rated by the French critics; archaeology was not, after all, Garnier's strong point; but it showed a remarkable versatility and readiness, and was at all events both picturesque and suggestive. The funeral ceremony took place on Saturday last, first at the Church of St. Severin, and afterwards at the Mont-Parnasse cemetery. In accordance with French custom on the interment of an eminent man, addresses in honour of his memory were delivered at the grave; M. Larroumet speaking in the name of the Department of Public Instruction and Fine Art, M. Frémiet representing the Académie des Beaux Arts, M. Alfred Normand speaking in the name of the Société Centrale des Architectes, M. Boisseau for French artists generally, and M. Roussy for the "Architectes Diplômés."

**MR. R. W. COLLIN.**—The death of Mr. Robert W. Collin, a Warrington builder and contractor, took place suddenly on the 9th inst. The deceased was 62 years of age.

**MR. W. G. RICHARDS.**—The death of Mr. William George Richards, builder, of Chipping Hill, Witham, took place recently, after a long illness. The deceased was a member of the Urban District Council from its formation until the last election, when he retired on account of failing health.

#### GENERAL BUILDING NEWS.

**PARISH CHURCH, GWYNFE, CARNARVONSHIRE.**—The foundation-stone has just been laid at Gwynfe of a new parish church. The church, the site of which is 30 yards or 40 yards to the north-east of the old church, is being erected by a local contractor, Mr. Daniel Price, of Llangadock, from designs by Mr. E. H. Bruton, architect, Cardiff, and the total cost will be about 1,600*l.* It will accommodate about 250 worshippers.

**CHURCH, LLANTIRISSANT.**—The foundation-stone has just been laid of a new church at Llantirissant, Anglesey. The church will be built in the Perpendicular style, from designs by Mr. P. Shearson Gregory, architect and diocesan surveyor, Bangor.

**KIRTLIE PARISH CHURCH, EDINBURGH.**—This church was reopened on the 4th inst., after alterations and improvements. The alterations have made the church entirely a new one, with the exception of its walls. Considerable additions have also been made, a tower, with exit porches, having been built at one end, and an apsidal chancel at the other. The old interior, which was wide in respect to its length, had a flat plaster ceiling. This has been changed to a timber ceiling open to the ridge. The greater part of the gable wall has been removed, and the entrance to the chancel is under a wide and lofty arch in chiselled stone, partly carried by three corbel pillars. Two stone steps lead up to the chancel, which is lighted by three lancet windows. An organ chamber enters off the chancel at one side, and opposite is the door to the vestry. The floor of the chancel and organ chamber is laid with encaustic tiles. The pulpit is placed in close proximity to the vestry door, and the seating (in three divisions) is in open benches, mostly in pitch pine. The walls are tinted primrose yellow, and the glazing is in leaded panels of cathedral tinted glass. A window by Messrs. Clayton & Bell has been erected, as a memorial, in one of the large side windows, having for its subject, "Christ, the King of Kings." The church is heated with hot-water pipes. The architects were Messrs. Hardy & Wight, Edinburgh.

**ST. CUTHBERT'S NEW CHURCH, MIDDLESBROUGH.**—The new Church of St. Cuthbert's, Middlesbrough, will accommodate over 800 people, and the cost of erecting the building is estimated at 8,500*l.* It is to be built of stone. The architect is Mr. Temple Moore, London, and the builders are Messrs. Harrison Bros.

**CATHOLIC CHURCH, BIRKDALE, SOUTHPORT.**—On the 7th inst. the new Church of St. Teresa, Everton-road, Birkdale, was opened. The church is built from the plans of Messrs. Sinnott, Sinnott, & Powell, of Liverpool, in the Transitional style, of red Burnley pressed bricks, with red sandstone dressings. It will accommodate 600 worshippers, and the contractors were Messrs. Fairbridge & Hatch, of Birkdale.

**HOLY TRINITY EPISCOPAL CHURCH, AYR.**—This church is being erected from designs by the late Mr. J. L. Pearson, R.A., London. It is in the Gothic style of the thirteenth century. A part of the church—chancel, side chapel, vestries, and organ-chamber—has been already built at a cost of 4,000*l.* To complete the nave and aisles and the tower to the first stage is estimated to cost upwards of 7,000*l.*

**CATHOLIC CHURCH, COLWYN BAY.**—The foundation-stone of this church (which is dedicated to

St. Joseph), was laid on Wednesday. The building is situate in Conway-road, and has been erected at a cost of 8,000*l.* The total cost of the land, building, and the furnishing and decoration of the interior will amount to about 12,000*l.* The style is Gothic, and the building, which will be of stone, will afford sitting accommodation for 600. Immediately adjoining the church, but facing Brackley-avenue, a presbytery will also be erected, and it is intended that the church and the presbytery will be completed by May next year. The architect is Mr. R. Curran, C.E., Warrington, and the contractor Mr. Thomas Brown, Chester.

**NAVE, ASTON CHURCH, BIRMINGHAM.**—On the 6th inst. the foundation-stone of the nave of St. James's Church, Aston, was laid by Sir John Holder, Bart. In March, 1895, the iron structure which formed the nave of the church was blown down, and since then efforts have been made to erect a new and permanent building, the total cost of which will exceed 4,000*l.* The new nave will be built mainly of brick, with stone dressings, and is designed with the idea that a tower will eventually be put up at the south-west corner. The architect is Mr. J. A. Chatwin, of Birmingham.

**CHURCH, BRYANSTON, DORSETSHIRE.**—A new church has been erected at Bryanston to take the place of the old parish church. The church has been almost entirely built of materials obtained from the demolished building, and consists of a nave, chancel, a short transeptal north aisle—known as the Portman aisle—a south aisle extending the full length of the nave, an organ-chamber on the south side, a vestry on the north side behind the choir, and a square western tower. The walling, both internally and externally, is faced with ashlar of Portland, Chilmark, and Tisbury stone, and the slightly roughened face of the old stonework, after being renewed, has been preserved as much as possible. A font of Hopton woodstone with a stem of Torquay marble, has been placed in the western end of the south aisle. The roofs of the nave, chancel, and aisles, as well as the ceiling under the ringers' loft of the tower, are of oak. Naunton stone slates form the external covering of the nave and chancel roofs, whilst the aisles and tower roofs are covered with cast lead, and the vane post of the tower with sheet copper. The flooring of the gangways of the nave and aisles is of old stone paving, with wood-blocks beneath the seats. These seats are entirely of oak. The chancel and sanctuary floors are laid with alternate squares of black and white marble. Portland stone has been used for the window mullions, tracery, and the rest of the dressed stone work. In the chancel the stalls and the screens behind them, as well as the woodwork across the arch of the organ chamber, are of oak, the ends of the stalls being carved in fleur-de-lys terminals, and having carved shields bearing the sacred monogram and the crown of thorns on their western faces. The east end of the chancel is panelled in oak, and behind the carved oak altar table is a retable. The pulpit stands on the north side of the chancel arch, and opposite to a new brass eagle lectern. A new organ has been placed in the chamber on the south side of the chancel. This projects through an archway into the chancel, its front being curved forward above the choir stalls. The motor which blows the organ is placed in a chamber below the instrument, and this, as well as the electric lighting of the church, is worked by means of a cable from the electrical station about a quarter of a mile away. The lighting of the church is effected by electricity. The installation is the work of Messrs. Christian & Phipps, of Hampton Wick, and the fittings have been made by Messrs. J. Powell & Son, of Whitefriars, from the architect's designs. The stained glass east window is of five lights. This was designed by Mr. R. Anning Bell and carried out by Mr. A. J. Dix. The centre light is occupied by a representation of the Crucifixion, and the right and left lights contain figures representing SS. Mary and John. The outer lights are occupied by figures of SS. Peter and James. The tower contains a peal of six new bells. They were supplied by Messrs. Warren & Sons, of Cripplegate. The tower in which they are situated is square in plan and has an octagonal stair turret on the south-east angle. It terminates in a battlemented and panelled parapet. The builders are Messrs. Wheeler Brothers, of Reading. The wrought-iron weather vane is the work of Mr. F. Chubb, of Hampstead, whilst the glazing of the windows has been done by Mr. J. Jennings, of Clapham. The carving in wood and stone was entrusted to Mr. L. A. Turner, of London, whilst the low-pressure hot-water heating apparatus—which comprises ventilation—has been carried out by Messrs. Hayen & Son, of Trowbridge. The architect was Mr. E. P. Warren, of Westminster.

**NEW CHURCH, ABERDEEN.**—Contracts have just been entered into for the erection of a church—to be called Bon Accord Congregational Church—in Bon Accord-terrace, near Union-street, Aberdeen. The building, which will be 52 ft. 6 in. wide (having gable elevation to the terrace), 59 ft. deep, and 53 ft. high, will be of granite. The church, with hall underneath, will cost 4,000*l.* In addition, three tenement houses, with shops on the ground floor, will be erected on the site acquired by the congregation. These, which have also been contracted for, will probably cost 3,600*l.* Mr. John Rust, Aberdeen, is architect.



**NEW FREE CHURCH, ROTHES.**—It is proposed to erect a new Free Church at Rothies. The architect is Mr. G. Sutherland, and his design was selected in a recent competition for the church. The plan shows a building seated for 400 on the ground floor, with an end gallery in addition. At the rear of the main building there are a hall, session-house, and vestry.

**BOARD SCHOOL, ANGLESEY.**—A new Board school has been opened at Brynysiceny, Anglesey. It was erected by Mr. H. Jones, Brynysiceny, from the designs of Mr. R. Davies, architect, Bangor, and will accommodate 220.

**RAGGED SCHOOL, MANCHESTER.**—The Charter street Ragged School, Manchester, is to be considerably enlarged. When the new building was erected in 1892, the old ragged school, which faces Charter-street, was left standing. The old school adjoins the newer part of the institution. It will be pulled down, and the ground on which it stands rebuilt upon. The newer school and girls' home, with the old school, occupy a small square, bounded by several streets, and the committee have bought two cottages in Ashley-lane, one of the narrow thoroughfares which run at right angles from Charter-street and surround the square. These cottages will be pulled down for the purpose of the extension. On the ground now covered by the old ragged school there will be built an addition to the newer school and the working girls' home. The basement of the new building will contain a kitchen and boiler-house and the other store-rooms necessary for carrying on the work of the ragged school. The new building will be in four stories. On the ground floor there will be placed near the entrance, which is at the corner of the building, an office for the use of the manager of the institution. There will also be stores and a room in which food may be prepared for the matron of the home for working girls, and store-rooms for the home. Higher still there will be found, when the building has been completed, two floors which will contain additions to the girls' home. These will include a kitchen, a laundry with a drying-room, and still higher an extension of the bathing accommodation and the cubicles of sleeping room accommodation and the cubicles of sleeping apartments. On the piece of ground in Ashley-lane now occupied by the cottages a house will be erected for a caretaker for the whole institution. Two club-rooms for use as part of the ragged school scheme will also be built. Above the club-rooms, and wholly separated, there will be another extension of the home for girls, consisting of sleeping and other apartments. The highest part of this portion of the new building will be so built as to form a play or recreation ground, covered as a protection from rain. The estimated cost of the extensions is 4,000l. The architects are Messrs. Maxwell & Tuke, of Manchester.

**MARLBOROUGH HOTEL, ST. JAMES'S.**—The new buildings, at the corner of Ryder and Bury-streets, are nearly completed. They are built of stone and red brick by Messrs. John Bennett & Co., of Guildford-street, from the plans and designs of Mr. G. D. Martin.

**NEW BOND-STREET.**—New premises have been begun upon the site of No. 126, west side. Messrs. H. & E. Lea, are the contractors, and Messrs. Lindsay, Neal, & Co., of Paddington, will supply the constructional steel work. The architect is Mr. E. Keynes Purchase.

**WORKHOUSE INFIRMARY, REDRUTH.**—A new infirmary has just been completed at Redruth, adjoining the workhouse. The building just erected comprises the women's section and administration block. It includes on the ground floor a main ward, 48 ft. by 24 ft.; separation ward, 16 ft. by 12 ft.; day room 20 ft. by 16 ft., with ward kitchen and necessary offices, consulting-room for medical officer, and dispensing store. On the first floor are the main ward, 48 ft. by 24 ft.; four wards for special cases, and ward kitchen. The nurses' apartments are placed over the administrative block on the second floor, and consist of two bedrooms, with large sitting-room and store. A glazed stoneware bath is placed on each floor, and an enameled iron bath adjacent to the nurses' rooms. All the rooms are accessible on each floor from a main corridor, 6 ft. wide, the internal and also the emergency external stairs being of granite. The building has been designed and carried out under the supervision of Mr. Sampson Hill, Redruth. The contract for masonry was let to Mr. T. Opie, for carpentry to Mr. W. C. Hodge, and for plumbing and heating to Mr. W. G. Wilton.

**COTTAGE HOSPITAL, LEOMINSTER.**—The Leominster Hospital Committee have decided to erect a new cottage hospital and nurse's home in South street, Leominster. The accommodation allows for five beds, and a separate building is provided for the matron and nursing staff. Mr. Ernest G. Davies, of Hereford, is the architect, and the work is to be put in hand immediately.

**CONSTITUTIONAL CLUB, NEW LEEDS.**—The foundation stone has just been laid of a Constitutional Club at New Leeds. The site is at the corner of Shepherd's-lane and Roundhay-road. Mr. C. D. Swale (Messrs. Swale & Mitchell) is the architect of the new building, and the principal contractors are Messrs. J. T. Wright & Son.

**HOTEL, LLANDRINDOD WELLS.**—The new Gwalia Hotel, Llandrindod Wells, which has just been opened, has been erected by Mr. D. Jenkins, of

Swansea, from designs furnished by Messrs. Swash & Bain, of Newport. The style is English Renaissance. The first, second, and third floors are utilised for bedrooms, which number about fifty-eight, as well as bath-rooms and lavatory accommodation. A passenger lift worked by electricity is placed near the entrance and travels to the top floor. The whole of the premises are supplied with electric light, and the central hall and all the corridors are heated when required by hot-water coils. The total cost of the building, including land, &c., has been 15,000l.

**IMPROVEMENTS AT HUTTON CASTLE, DERWICKSHIRE.**—For some time past Lord Tweedmouth has been carrying out improvements upon the building known as Hutton Hall, Derwicksire, the name of which has been changed to Hutton Castle. The old tower has been made habitable, the centre portion of the building has been raised one story, and four pepperbox turrets placed at the corners; the west wing has been extended, and a new range of kitchen offices added. The new portions have asphalted roofs with embrasures and parapets. The interior generally is altered to some extent, and includes additional bedrooms, as well as accommodation for servants. Mr. Alexander Ross, the estate overseer, designed the roads. About 1,000l. has been expended in laying out the grounds, the contractors being Messrs. Smith & Son, Derby. At the west drive a lodge has been constructed. The contractors were—Mason, Mr. Henry Steel, Greenlaw; joiner, Mr. James Crombie, Duns; plumber, Mr. Ford, Goldstream; plaster and plasterer, Mr. Wm. Fortune, Chirnside; painter, Mr. Hume, Duns. Mr. Thomson, C.E., Edinburgh, has engineered the sanitary work. For the lodge the contractors were—Mr. Patterson, Alton, mason; Messrs. Edgeley & Son, Chirnside, joiners; Mr. Thomson, Edinburgh, plumber; Mr. Peter Newbigging, Duns, plumber; Mr. G. G. Durr, of Duns, was the architect.

**BRANCH PUBLIC LIBRARY, STOCKINGRIDGE, EDINBURGH.**—At the Edinburgh Dean of Guild Court, on the 4th inst., an application on behalf of Thomas Nelson's Trustees to take down buildings and erect a branch public library at Hamilton-place for the Stockbridge district was granted. The site of the new library is at the corner of Hamilton Place and Deanbank-street, and the building will consist of one story, and will be lighted throughout from the roof. The front entrance will be in Hamilton-place, to the right of which will be the Nelson Hall, in which will be the recreation and the news-rooms. The library and the counter for giving out books will occupy the centre of the building, and under the octagonal tower, which will be erected at the corner, and extending along Deanbank-street, will be the reading-room. The new library will adjoin Stockbridge Public School. Messrs. Lesells & Taylor are the architects.

**CHILDREN'S WARD, DEWSBURY AND DISTRICT INFIRMARY.**—A children's ward has just been opened at this institution. Mr. A. H. Kirk was the architect.

**CLOCK TOWER, COLMONELL, AYRESHIRE.**—The presentation of the Victoria Diamond Jubilee Clock Tower to the Public Hall Trustees, Colmoneil, took place recently. The tower was built from plans prepared by Mr. Allan Stevenson, architect, Ayr.

**LIBERAL CLUB, HUDDERSFIELD.**—On the 6th inst. the foundation-stones were laid of a new Liberal Club in the Crosland Moor district of the borough of Huddersfield. Mr. J. E. Lunn, of Millsbridge, is the architect.

**PROPOSED WORKHOUSE, HASTINGS.**—At a recent meeting of the Hastings Board of Guardians the question of the proposed new workhouse came up for discussion. A committee of the Board had met the Local Government Board, and under their guidance Messrs. Jeffrey & Skiller, architects, Hastings, had prepared plans for a building to cost 41,200l. The Clerk read the report of the Committee, which set forth that the proposed building would be erected on the nine acre site, and meet the requirements of the Local Government Board, and provided the accommodation agreed upon by the Board, with the exception of thirty-six women, owing to the room in the women's pavilion being decreased. The estimate did not include fencing or an engine for the laundry. The latter would bring the total cost up to 41,723l. The architects' report showed that accommodation was provided for 154 men (45 able-bodied and 109 aged), 184 women (86 able-bodied and 98 aged). Other accommodation included was that for 44 vagrants. In the administrative block there were master's and matron's rooms, dining-room for 400, capable of being increased to 500, kitchen for 500, with fittings for 350, and a separate building for an additional scale. The Chairman moved the adoption of the plans and report, and Mr. Walder seconded the proposition. The motion was carried *unanimously*.

**THE CONDITION OF YORK MINSTER.**—In a report on the state of the fabric of York Minster, the Dean of York says:—"The work on the south side of the nave has been completed, and the grand pinnacles restored in all their pristine beauty. This has been most carefully carried out, all existing details have been preserved, and those which have crumbled away as far as possible accurately reproduced. . . . Now the scaffolding has been removed to the east end, and another equally expensive and necessary work begun. . . . The work at the east end will be completed in about twelve months; then we shall

commence a similar work at the west end, where immediate attention is required to the ornamentation thereof, much of which is in a dangerous condition." . . .

#### SANITARY AND ENGINEERING NEWS.

**SEWERAGE OF AUDENSHAW.**—The Audenshaw Urban District Council have approved and adopted the proposals of Mr. J. P. Wilkinson, A.M.Inst.C.E., Manchester, for the sewerage of the district. The estimated cost is 14,500l.

**NEW GOODS STATION, MANCHESTER.**—The first portion of the new Deansgate goods depot of the Great Northern Railway Company in Manchester has been opened for the reception of traffic. The new goods station adjoins the Manchester Central passenger station—the new goods station is carried by a girder bridge over Deansgate, and they enter the site of the depot at a considerable height above the ground level. The approach road, which is about 300 yards in length, immediately spreads out into six tracks carried on an upper floor supported upon steel stanchions, at the base of which stands a very large shed for use in loading and unloading trucks. Above this shed a warehouse of three more floors, 80 ft. in total height, is in course of construction; and upon each side of the shed branch lines run down at a moderate gradient to the ground floor of the depot, which, like the upper floor, is laid out with tracks and banks for the shunting, marshalling, loading, and unloading of trucks. Thus the area of the site, which is nearly seven acres, is utilized twice over for the purposes of a goods terminus, whilst it also provides the foundation for very extensive warehouse accommodation. Arrangements have been made to light the depot throughout with electric light, and the whole work has been carried out by Messrs. Robert Neil & Sons, of Manchester, under the supervision of Mr. A. Ross, the Great Northern Company's engineer-in-chief. —*Times*.

**GLASGOW SEWAGE SCHEME.**—The Sub-Committee of the Glasgow Corporation appointed to visit different cities and towns in England and inspect the arrangements in use for the treatment of sewage and the disposal of sewage have issued their report. Among other places visited were London, Manchester, and Salford. As an outcome of their investigations, the deputation are impelled to the conclusion that the design of new sewage works at Dalnair and Braehead, it is imperative to continue the use of methods where experience has proved practicable on a large scale, and there seems no room for doubt that chemical precipitation alone is the means to adopt, and the most economical and satisfactory method of disposing of the sewage is to send it to sea. While implying no disparagement to the efficiency of the methods in use at Dalnair and Braehead—which are the only possible means available under the circumstances—the deputation are satisfied that these methods cannot be advantageously applied at Dalnair or at Braehead, where the use of sewage to be ultimately treated is so much larger that it would be hopeless to look for a market for any form of pressed sludge, no matter how high might be its estimation among agriculturists. The initial volume of sewage to be treated at Dalnair is estimated at 27,000,000 gallons of dry weather flow per day, which will ultimately be increased to about 48,000,000. Supposing the works at Dalnair and Braehead to be in operation, the combined daily product of sewage would not for some time exceed 1,200 tons a day, the ultimate quantity being about 2,300 tons. Two barges would for years suffice for the removal of the whole sludge, though eventually a third would require to be added, and the sub-committee have little doubt that the sludge can be disposed of in this manner more economically than by pressing. The sub-committee think that no time should now be lost in commencing the undertaking. —*Glasgow Herald*.

**NORTH SUNDERLAND RAILWAY.**—The North Sunderland Light Railway, which has been in course of construction during the last two years, was opened for goods traffic on the 1st inst. The line, which is just four miles in length, joins the North-Eastern main line about 100 yards north of Chathill Station. There are two stations on the line, a small one at North Sunderland and a larger one at Seahouses terminus. The work of construction was begun by Mr. A. Haslett, of London, but has been chiefly carried out by the Messrs. Whitaker Bros., Leeds, Mr. J. A. Thornton, of Manchester, being the engineer.

**PUBLIC IMPROVEMENTS AT ST. HELENS.**—On the 6th inst. Gold and J. J. Hargreaves, inspectors of the Local Government Board, held inquiries at St. Helens Town Hall into applications by the St. Helens Corporation for sanction to borrow 900l. for works of paving, 2,500l. for the construction of a storm water overflow sewer in Liverpool-road, and 5,000l. for the construction of a subway in Church-street and Ormskirk-street. The Borough Surveyor (Mr. G. J. C. Broom) produced plans of the proposed subway, which he explained to the inspectors. The scheme for the construction of a



storm water overflow sewer in Liverpool-road district was next placed before the inspector.

**PUBLIC IMPROVEMENTS, LLANDUDNO.**—Mr. Walter Ducat held an inquiry on the 2nd inst. at Llandudno respecting an application by the District Council to the Local Government Board to sanction loans of 2,350*l.* for water undertaking, 1,400*l.* for street improvement, 500*l.* for the provision of shelters on the promenade, 250*l.* for sewerage works, and 225*l.* for the erection of a fire station at Craig-ydon. The Engineer (Mr. E. Paley Stephenson, C.E.), in explaining the water extension, said that it was proposed to raise 20,000 gallons, the motive power being a gas engine. It would serve a district of 100 houses, but the scheme provided for 550. The capacity of the proposed reservoir would be 50,000 gallons. Mr. Humphreys, the surveyor of the Mostyn estate, said that he was present to give every facility for the carrying out of the scheme.

### STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW, LOWESTOFT.**—At the Methodist Free Church, Lowestoft, Lowestoft, was recently unveiled two new stained glass memorial windows, which have been erected in the church in memory of the late Henry and Mary Tuttle. The windows are in the east and west ends of the building, and are the work of Mr. J. Jennings of London.

**WINDOW, ASBURY CHAPEL, HANDSWORTH.**—A memorial window to the late Mrs. H. S. Richards, in the chancel of the Asbury Memorial Church, Handsworth, was unveiled on the 31st ult. The window was designed and executed by Mr. T. W. Camm, of Smethwick. The chancel is being decorated from Mr. Camm's design.

**WINDOWS, ST. JAMES'S CHURCH, CRICKEN, BRAY, IRELAND.**—On the 20th ult., at the Church of St. James, Cricken, near Bray, three new stained-glass windows were dedicated. The first is a memorial to the late Archbishop Plunket, erected by the members of the congregation, and constructed by Messrs. Heaton, Butler, & Baynes of London. The second window is a memorial to the late William Eaton Caldwell, M.A., J.P. This window was also executed by Messrs. Heaton, Butler, & Baynes. The third window, which is not yet quite completed, has been presented by Miss Magan. The stained glass is supplied by Mayer, of Munich. The stonework for all the windows has been executed by Mr. Beckett, Ringsend. The architects are Messrs. Rawson, Carroll, & Batchelor.

**PORTRAIT MEDALLION, FOLKSTONE.**—The memorial which has just been unveiled by the Rural Dean to the memory of the late Vicar, Rev. Claude Stanquety, M.A., consists of a portrait medallion in statuary marble, set in an architectural framework of alabaster. It was executed by Mr. J. N. Forsyth, of Finchley-road. The architectural portion was designed by Mr. W. A. Forsyth.

**WINDOW, COLTNESS, LANARKSHIRE.**—Messrs. Stephen Adam & Son, Glasgow, have just erected in Coltness Memorial Church a stained-glass window, showing four figure subjects principally taken from the Book of Nehemiah and the New Testament.

### FOREIGN.

**FRANCE.**—The Prix de Rome in architecture has been awarded to M. Léon Chiffot, pupil of MM. Daumet, Girault, and Esquié.—M. René Binet, the architect, has been commissioned to design the monumental entrance to the 1900 Exhibition, next the Place de la Concorde. It will form a semi-circle with sixty entrance gates for the public, and will be surmounted with a cupola decorated with faience.—At the Gobelin manufactory an interesting exhibition has been opened of models, decorative panels, cartoons, &c., executed by the tapestry artists of the establishment.—The repair or partial rebuilding of the well-known facade of the Ministère de Marine, facing the Place de la Concorde, is to be shortly carried out; a work which has long been needed.—M. Camus has been appointed architect for the new buildings in connexion with the Department of Public Instruction, at the corner of Rue de Grenelle. The cost is estimated at 700,000 francs.—At the new Circus there is an exhibition of models, drawings and paintings by M. Falguère.—The foundations of the Alexandre III. bridge are now completed, and the masonry superstructure is in active progress. A temporary foot bridge is to be placed over the Seine at this point, to be removed when the main structure is completed.—The architectural Department of the Paris Municipality is about to undertake the restoration of the Church of St. Médard, one of the oldest churches in Paris.—M. Théodore Lambert has obtained the first prize in the competition opened at Besançon for the restoration of the Hôtel de Ville.—The President of the Republic has laid the first stone of the breakwater for the new basin at Havre.

**HOLLAND.**—Thirteen hundred carpenters of Amsterdam have gone out on strike. They had demanded higher wages and insurance against accidents. The masters declined to increase their pay, and they accordingly ceased work, all efforts at a settlement on any other terms proving fruitless.

**JOHANNESBURG.**—The designs executed by Messrs. Arthur & Walter Reid, architects, of Cape Town and Johannesburg, have been selected for the rebuilding of the Wanderers' Club, Johannesburg, which was destroyed by fire some months since. The cost of the new structure will be upwards of 20,000*l.* The great hall will be 120*ft.* long and 80*ft.* wide.—*Standard and Diggers News.*

### MISCELLANEOUS.

"SPECIFICATIONS FOR BUILDING WORKS."—Our attention has been called to the fact that in Mr. Farrow's book on Specification for Building Works, lately issued from this office, a chapter on electric wiring contains a copy of a specification prepared by Mr. Adrian Collins, A.M.Inst.C.E., of 61, Old Broad-street, E.C., for works which have been executed under his supervision. This copy was inserted in the book without the knowledge of the publisher of the book or of the author. Immediately on the matter being brought to the notice of the publisher he caused an inset to be inserted in the book stating the facts of the case.

**A PALACE FOR THE ARCHBISHOP OF CANTERBURY.**—A portion of the money derived from the recent sale of Addington Park is to be applied to providing a palace at Canterbury, within the precincts of the Cathedral. The Ecclesiastical Commissioners have sanctioned an arrangement for making additions on its north and east sides to the house occupied by the late Mr. Henry Austin, Surveyor of the Cathedral; the Dean and Chapter will re-convey to the See the property which in olden time formed part of the Archbishops' palace.

**PETER-LANE.**—The "White Horse" tavern, Nos. 80 and 91, on the street's west side is now nearly demolished. It was a famous coaching-house in the old days, and the starting place for many favourite coaches that ran to Oxford, Cambridge, and other large towns in the east and west of England. Of late years it degenerated into a common lodging-house. To the south stood a quaint old gabled house, No. 92, and Norwich-court, formerly Magpie-yard. Both the house and the north side of the court have been demolished for a new thoroughfare, renamed Norwich-street, leading into Farnival, formerly Castle-street, Holborn.

**MEMORIAL OBELISK TO THE ETRICK SHEPHERD.**—On the 28th ult., at Etrickhall, Selkirkshire, a memorial of the Etrick Shepherd, which has been erected on the site of the poet's birthplace, was unveiled. The memorial takes the form of an obelisk, about 20*ft.* in height, with a bronze medalion of Hogg on the central stone (by Mr. Hubert Paton), and was built by Messrs. John Marshall & Sons, Hawick, from a design prepared by Mr. Heiton, architect, Perth.

**TINTERN ABBEY AND RAGLAN CASTLE.**—Monmouthshire County Council, at a meeting held at Newport on the 3rd inst., on the motion of Sir Henry Jackson, Bart., appointed a committee for the purpose of acquiring the historic ruins of Tintern Abbey and Raglan Castle for the county.

**PARLIAMENT-STEAM IMPROVEMENT.**—At the Town Hall, Westminster, on the 5th inst., Mr. Troubridge and a special jury heard the case of The Aerated Bread Company, Limited, v. Her Majesty's Office of Works—a claim for about 20,000*l.* compensation in respect of their leasehold and trade interest in Nos. 31 and 32, Parliament-street, and No. 179, St. George-street, Westminster, used as a refreshment depot on the ground floor and basement. Mr. Littler, Q.C., and Mr. Reader Harris, Q.C., appeared for the claimants; the Attorney-General, Mr. Danckwerts, and Mr. Peacock represented the Office of Works. The first witness, Mr. Edward Tewson (Messrs. Debenham, Tewson, Farmer, & Bridgewater), stated that the premises in question were let on lease for a term of which ten years was still unexpired at a rental of 950*l.* a year, and that they were now worth 1,600*l.* a year, showing a profit rental of 650*l.* a year. He capitalised that on the 5 per cent. table (77 years' purchase) 5,005*l.*, and added the customary 10 per cent. for compulsory sale, 500*l.*, making together 5,505*l.* The net profits of the depot were 3,250*l.* per annum, and after deducting the profit rent, 650*l.*, and adding 300*l.* for underlettings of the upper part of the premises, he arrived at a profit of 2,900*l.*, which should be capitalised at five years' purchase, 14,500*l.*, to compensate the company for loss of the business. His total was thus 20,055*l.*, to which he added an agreed sum of 410*l.* in respect of the fixtures, making altogether 20,465*l.* Mr. Henry Charles Trollope (Messrs. Trollope & Sons) confirmed Mr. Tewson's evidence. The case was adjourned until the 9th inst. On behalf of the Crown, several expert witnesses were called, including Mr. Robert Vigers (President of the Surveyors' Institution), Mr. Horne, Mr. James Green, and Mr. Ryde, whose valuations of the leasehold interest, including two years' purchase of the net trade profits of the depot, which were put at 1,255*l.* per annum, varied from 4,420*l.* to 4,937*l.* The jury awarded 9,400*l.* compensation.

**MURAL DECORATIONS, ROYAL EXCHANGE.**—Under the auspices of the Gresham Committee and the Mercers' Company, Messrs. W. Cubitt & Co. are preparing niches on the walls of the ambulatory of the Royal Exchange for the reception of further

mural decorations. The following scenes will form the subjects of the various designs.—William the Conqueror granting a charter to the citizens of London (Mr. Seymour Lucas, R.A.), the gift of the Corporation; the Opening of the Royal Exchange by Queen Elizabeth (Mr. Ernest Crofts, R.A.), the gift of the Mercers' Company; the Crown of England being offered to Richard III. at Baynard's Castle (Mr. E. Goetze), the gift of Mr. Carl Meyer; a Scene from the Great Fire of London, 1666 (Mr. Stanhope Forbes, A.R.A.), the gift of the Sun Fire Insurance Company. These pictures are fixed by Messrs. Charles Roberson & Company's new process of "Marouflage," and are painted on a new medium termed spirit fresco. The colours ground in this medium are used in a somewhat similar manner to ordinary oil colours on a specially prepared, highly absorbent canvas, which, when the picture is finished, is laid solidly on the wall. It is expected that the Lord Mayor will unveil these panels in September, and it is stated that the cost of each is upwards of 500*l.*—*Times.*

**CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.**—The certificates awarded by the examiners for the summer term of the present year to the students of the Crystal Palace School of Practical Engineering were announced on the 4th inst. in the lecture theatre of the School. The chair was taken by Mr. George Byland Roche, Consulting Engineer to the London, Chatham, and Dover Railway Company. Mr. R. G. Hodson read the reports of the examiners. Mr. Percy J. Ogle stated that he was satisfied that the course prepared for the students in the Mechanical Section was one which could scarcely be improved on as a preliminary education to those adopting any branch of the engineering profession. As thirty out of thirty-six who were eligible for examination had passed the minimum, he doubted if this average had ever been exceeded. Mr. David Gravell, Examiner of the Civil Engineering department, was of opinion that the standard now attained by the majority of the students was distinctly higher than in 1892, when he acted in the same capacity. Reporting on the Electrical Department, Mr. E. M. Lacey said that the papers generally showed considerable ability and application, and that the practical work was greatly above the average. The Chairman expressed his high sense of the value of the training given in this school. He then distributed the certificates to the students, and Mr. W. Green, one of the Palace Directors, expressed the thanks of the company to the examiners for their services. He spoke of the Engineering School as one of the most important institutions connected with the Crystal Palace, and recommended all the students to become members of the "Old Students' Society." The three examiners severally returned thanks. A vote of thanks was also given to Mr. J. W. Wilson, who has been principal of the school for over a quarter of a century. Mr. Wilson, in responding, referred to the success which the students in the school had obtained in their profession. A vote of thanks to the Chairman brought the proceedings to a close.

**CONFERENCE OF SANITARY INSPECTORS.**—The autumn conference of the Sanitary Inspectors' Association has just been held at Newcastle-on-Tyne. The delegates were welcomed by the Mayor, after which Mr. Thomas G. Dee, London, took the chair. On the motion of Mr. Alexander, seconded by Mr. Thomas, London, a resolution was adopted to petition the Local Government Board as to the approaching appointment of the Board for the examination and certification of candidates for the position of sanitary inspectors, and declaring that it was of great importance that the practical experience of members of the Association should be represented on each examination board. Mr. W. Bland, Newcastle-on-Tyne, read a paper on the advantages of sanitary inspection, in which he urged the establishment of a Government board of health, to whom all matters affecting the public health should be referred, and who should have direct control over all local inspectors; the removal of medical officers and inspectors from the fear of local influence; the appointment of competent and trained men as inspectors; and the education of the public in the laws of hygiene and sanitation by the compulsory teaching of these subjects at our schools. Dr. H. Scurfield, Medical Officer of Health, Sunderland, then read a paper on "Testing Ventilation." A paper on "Sanitation in Colliery Districts" was read by Mr. W. F. Curry, Surveyor and Sanitary Inspector, Morpeth. Mr. Curry advocated a better water supply and the provision of a bathroom in the pitman's house. Mr. C. Irvin, River Tyne, Port Inspector, read a paper on "Port Sanitary Administration." Twenty-five years ago, he said, there was no systematic inspection of ships, and severe epidemics were brought from foreign countries; but since the new regulations all this had been changed. Mr. W. H. Wells, Chief Sanitary Inspector to the Newcastle Corporation, read a paper on "Suggested Improvements in any future Public Health Legislation." The members of the Association dined together in the evening.

**SANITARY DEPOT, LEEDS.**—The new central sanitary depot, upon which the Leeds Corporation are spending over 30,000*l.*, is situated in Dock-street, to the south of Leeds Bridge. Stabling accommodation is here provided for 168 horses. Offices, store-rooms, and sheds for vehicles are also being built.



**CLOCK, LEICESTER.**—A clock has just been erected in St. Margaret's Church, Leicester, by Messrs. John Smith & Sons, Derby. It shows the time on four dials, and plays the Westminster chimes.

**THE SANITARY INSTITUTE.**—At an examination in practical sanitary science, held at Liverpool on July 29 and 30, five candidates presented themselves. The following three candidates were granted certificates in practical sanitary science: H. E. Bellamy, Truro; T. Graham, Birkenhead; T. Summers, M.Inst.C.E., Edinburgh. At an examination for Inspectors of Nuisances, held at Liverpool on the same days, sixty-four candidates presented themselves. The following thirty-seven candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances:—J. Allan, Greenock; F. Atkinson, Coppice, Oldham; F. T. Bare, Gravesend; W. F. Bickford, Plymouth; J. H. Brocklehurst, Chadderton, Oldham; A. E. Cheetham, Urmoston, Manchester; A. Cliffe, Liverpool; Miss E. Coppock (L), Urmoston; H. Corbridge, Liverpool; J. Crossland, Bowness-on-Windermere (A. E. Croxford, Liverpool; J. J. Daff, Wilford, Nottingham; W. T. Flood, Warrington; C. H. France, Wigan; M. Garra, Stockton Heath; Warrington; T. Glenn, Daubhill, Bolton, Lancs.; J. T. Green, Walsall; W. Harrison, Kensington, Liverpool; J. Hermann, Dartford; C. F. Hobday, West Norwood Estate Offices; W. J. Jackson, Everton, Liverpool; W. H. Jackson, Aintree, Liverpool; R. J. Langley, jun., Bolton-le-Sands; A. G. Leigh, Chorley, Lancs.; C. F. Marshall, Liverpool; J. Marshall, Little Hulton, near Bolton; J. Moore, Blackpool; S. Partington, Hollinwood; J. F. Rossington, Sheffield; T. Sharps, Seely, Manchester; H. G. W. Silcox, Bath; A. Smith, Seacombe; J. Walker, Kendal; F. H. Williams, Croydon; O. O. Williams, Penlynden-draeth; W. J. Winter, Liverpool; G. Winterbottom, Waterhead, Oldham.

**THE DUTIES OF DISTRICT SURVEYORS.**—The Battersea Vestry have had under consideration the recent accidents which have taken place on buildings in course of erection and alteration, and have passed resolutions to the effect that (1) all District Surveyors should devote the whole of their time to the duties of district surveying; that (2) District Surveyors should be paid a salary by the County Council, and that all building fees (if continued) should be paid to the County Council direct; and that (3) an office should be provided for the District Surveyor at the local vestry hall, so that he may be brought into closer touch with the Local Authority. These resolutions have now been communicated to the London County Council, and the Battersea Vestry have asked each of the other Local Authorities throughout the metropolis to support them in their attitude to the Council in this respect.

**BRADFORD BUILDING TRADES AND STONE EXCHANGE.**—The second annual meeting of the members of this Exchange took place at the Exchange on the 4th inst. Mr. Ellis Robinson in the chair. It was reported that the first year had been a uniformly successful one, the membership now numbering over 600. The report and balance-sheet were passed, and the following gentlemen were elected members of the committee:—Messrs. Julius Whitehead, Robert Roper, W. H. Vickers, Phineas Drake, and Joseph Baxter.

**ELECTRIC LIGHTING, LEIGH, LANCASHIRE.**—Mr. W. O. E. Metcalfe, Inspector of the Local Government Board, held an inquiry on the 9th inst. at the Town Hall, Leigh, into the application of the Leigh District Council for sanction to borrow 25,000l. for gasworks extensions and 10,500l. for purposes of electric lighting.

**MARTYRS' MEMORIAL, CANTERBURY.**—The building of the Martyrs' Memorial, which is to be erected at Canterbury, has been entrusted to Messrs. J. Whitehead & Sons, Limited, granite merchants, of Westminster and Aberdeen. Mr. A. H. Campbell, of Canterbury, is the architect.

### CAPITAL AND LABOUR.

**PLUMBERS' STRIKE AT BOLTON.**—The Bolton Master Plumbers' Association decided, on the 2nd inst., to lock out the whole of the men in town and district, pending a definite settlement of the strike at one establishment, where the men left work because of the alleged introduction of non-union labour. The strikers refused to work on a certain job because Liverpool metallic pipeworkers are engaged on it.

**BUILDING DISPUTE, BRISTOL.**—On the 30th ult. the Bristol Master Builders' Association and the Operative Bricklayers' Society met at the office of the Bristol Chamber of Commerce, under the presidency of his Honour Judge Austin, as mediator in the dispute between the masters and operatives. The former body was represented by Messrs. A. Krauss (President), George Humphreys (Treasurer), W. Church, G. Wilkins, G. Downs, E. Walters, and Henry J. Spear (Secretary); and the Bricklayers' Society by Messrs. W. H. Roe, C. Sprague, Walter Bool, H. Prigg, and E. Stock (Secretary). Mr. Stock, on behalf of the bricklayers, submitted his case as to why his society contended they should be entitled to a 4d. per hour extra on September 1 and a 4d. per hour on March 30 next—that it was mainly in consequence of their exposure and the loss of time

owing to the severity of the weather during the winter months. Mr. A. Krauss replied to the points raised, and a general discussion ensued. The question of walking time (Rule 8) was fully considered, and Mr. George Humphreys made a statement affecting this question from the masters' standpoint, to the effect that this rule had had very full consideration by the Master Builders' Association in the many meetings between employers and operatives, and was very fully discussed by the Federated Societies before the arbitrator appointed by the Board of Trade. The decision arrived at was agreed to by both employers and operatives, without appealing to the arbitrator for his decision, and he was of opinion that this rule did not press at all heavily on any branch of the operatives. The Bricklayers' Society wished to delete the latter clause, but if such were done it would be manifestly unfair to the employers living outside the two mile radius, inasmuch as some of them would actually have to pay walking time for the men to come to work at their places of business, although the men might have to pass their shop to get to other shops which might be several miles further on, and within the two mile radius. The employer living outside the two mile radius would thus be handicapped in contracting for work inside the boundary. On the other hand, it would also be manifestly unfair to contractors inside the city boundary, inasmuch as work of any magnitude put up for competition near the city would enable a contractor to seek employment to employ men on the works, when contractors inside the city would have to pay walking time, and thus allow the contractor at a distance a distinct advantage over a local contractor. Mr. Humphreys said he had been in business some forty years, and had never had a dispute with any of his men on this rule. He always found men seek employment nearest their homes, and had had men leave him frequently to do so. If a contractor had work outside the boundary, away in the residential suburbs, he had to then offer some inducement to get the men to apply for work on the jobs, and he therefore was of opinion that this clause should stand as at present arranged with the other branches of the trade, viz., masons, carpenters, plasterers, painters, plumbers, labourers, &c. The operatives replied that the masters' requirements were very prejudicial to the bricklayers. His Honour remarked that he was pleased at the good humour that existed between the two parties during the progress of the inquiry, and stated that he would consider the various points raised, and give a reply in writing; and he hoped that both parties would act upon his decision, which he should submit with sincere good will. On the 1st inst. his Honour submitted a statement on the question at issue, in the course of which he said, "After careful consideration I have come to the conclusion that the men will be well advised if they agree to the rules settled by Mr. Hudson and approved by the federated trades." It is clear from the rules themselves that Mr. Hudson intended (at first, at all events) that the rule should apply to the bricklayers as well as to the other trades. In my opinion, the men ought to agree to these rules in their own interests, in the interests of the labourers whose work is dependent upon them, and in the interest of the trade generally. I will shortly give my reasons. As to point 1, it is no doubt true that the bricklayers suffer from loss of time during bad weather, but they have failed to convince me that this loss is in any substantial degree greater than that of the masons, carpenters, and plasterers. It is to some extent greater, but as against this difference, the bricklayers ought to consider the greater expense of tools in the other trades. As to point 2, it appears to me to be impossible to make any arrangement which will not be open to some objection, because the relative position of the works and of the men's residences must vary in the case of each job undertaken. On the whole, I have come to the conclusion that the objections raised by the masters to the rule as it stands, without the limitation, are graver and of more weight than those raised by the men to the limitation settled by Mr. Hudson. Moreover, the men have failed to convince me that, as bricklayers, they are prejudiced by the limitation to any greater extent than are the members of the Federated Trades who have accepted Mr. Hudson's view. In conclusion, I should like to say why, in my opinion, the men may properly accept Mr. Hudson's rules. In the first place, they will get under those rules prompt and substantial rise in wages. Possibly the masters may see their way to make that rise to take effect immediately, instead of postponing it until September 1. In the next place, it is, of course, better for the employer, for everybody else that trade disputes should not be frequently recurring. If the bricklayers were to succeed in obtaining those advantages for which they are now contending, the result would probably be to create amongst the skilled workmen in the federated trades a feeling of jealousy, which would be most prejudicial to the chances of a useful and enduring settlement. (Signed) J. V. Austin." On the 5th inst. a full meeting of the members of the Masters' Association was held at the Guildhall, Small-street, under the presidency of Mr. A. Krauss. The statement of his Honour, was formally submitted, and a reply of the Bricklayers' Society, in which they declined to accept the terms of the settlement, was also submitted. It was reported that a letter

had been addressed to the General Secretary of the Executive Council of the Bricklayers' Society in London, making certain inquiries as to the attitude of the local branch, and a telegram was read intimating that a member of the executive, Mr. Jeffery, would be in Bristol that day for the purpose of investigating the points of difference. That gentleman, in conjunction with the local secretary, had an interview with the officials of the master builders, the outcome of which was that Mr. Jeffery made a suggestion that he would, subject to the approval of the Master Builders' Association, submit a proposal to the Bricklayers' Society to the effect that the members conform to the recommendations as laid down by Judge Austin. This proposal having been submitted to the general body of master builders, it was resolved as follows:—"That if the bricklayers will, on reconsideration, accept the recommendations of Judge Austin, the Master Builders' Association feel disposed to adopt his suggestion as to when the increased wages shall commence, provided the rules are signed forthwith." This resolution was then handed to the representatives of the Bricklayers' Society, and they promised that the same should be brought under the notice of their Society. Accordingly a meeting of the Bricklayers' Society was held, and by a substantial majority it was resolved that the bricklayers would resume work on condition that the increased wages came into force on Monday morning.

**THE BUILDING TRADE DISPUTE AT BOLTON.**—As a result of negotiations the dispute in the plastering trade at Bolton is at an end. On June 18 the men struck work for an advance from 9d. to 10d. per hour, and a reduction of working hours from fifty-two to forty-nine and a half. The question was then referred to the Lancashire and Cheshire Building Trades Federation. Conferences have been held, and a meeting of the last conference just held is that amended rules have been signed, and the men have returned to work. A concession is made in the hours in favour of the men, who are also granted the advance of 1d. per hour, making the rate 10d. The men, on the other hand, concede one apprentice reported in the *Builder* of February 10 last, of two, whatever the number of men employed. The rules stand until the first Saturday in July next year.

### LEGAL.

**INJURY TO BUILDINGS THROUGH EXCAVATIONS.—IMPORTANT JUDGMENT.**

MR. JUSTICE NORTH, in the Chancery Division on the 4th inst., delivered judgment in the case of *Jordan v. The Sutton, Southcoates & Drypool Gas Company*, which was tried before his lordship in February, and which reported in the *Builder* of February 10 last. His lordship then decided some issues of fact, and reserved his decision upon some points of law relating to the liability of a corporation in respect of acts done by them in the exercise of their statutory powers. The facts were shortly these:—The plaintiff is the owner of twenty-four cottages in Hull adjoining the gas company's premises, and in July, 1896, the company by their contractors, Messrs. Holmes & King (also defendants), began to excavate for the purpose of constructing a sunk gasholder tank, in which to receive and seal with water a very large telescopic gasholder, intended to rise, when fully inflated, to over 100 ft. above the ground level. The circular trench which the contractors made to build the enclosing wall of the tank was only a few feet from the back wall of the nearest cottage. The trench was carried down to a depth of about 37 ft., and the work had to be carried through a variety of strata, including one called "running silt," and was particularly difficult to deal with. This stratum was about 6 ft. 6 in. thick, and was immediately followed by a thin layer of soft clay, below that being a firm basis of impermeable gault clay. The plaintiff alleged that cracks on his land and in his cottages had occurred in consequence of subsidence caused by the withdrawal of water and sand in suspension from the running silt bed, and he further alleged that the contractors had not adopted the best-known methods of damming back the water and silt during the operation of constructing the tank; in other words, that there had been negligence. The company contended that they had a common-law right to remove water, even if in doing so they abstracted matter in solution, and that any damage caused to their neighbour's property thereby was not actionable. They also contended, as a matter of fact, that the subsidence which took place was due entirely to the abstraction of water alone, and not appreciable to the abstraction of matter in solution. They also further contended that they had statutory powers to act as they had done, and that, apart from the question of negligence in doing the work, they were entitled to interfere, and proposed to interfere, with the rights which the plaintiff would otherwise have had. Mr. Justice North on the issues of fact on February 15 held that the gasholder, when erected and inflated to the proposed height of over 100 ft., must interfere with the access of light to the cottages in question, although he could not say that the method of doing the work was improper. He also held that the plan adopted had been skillfully carried into execution, and that the subsidence was not due merely to the abstraction of underground water, but also to the abstraction



tion of silt held in suspension in the water abstracted. The question he had now to determine was whether the defendants had any legal justification for what they had done and were doing. With regard to the proposition that the construction of the trench and the erection of the gasholder were acts for which the company had statutory powers, and that those powers could not be released, his lordship held that notwithstanding the company's acts did authorise the erection of a gasholder at this place, there was no obligation on the company to place it upon this exact site, or to make it of such a height or size as they had chosen to do. To make out their case the company must show that they could not, without interference with the plaintiff's rights, do something which they were bound to do. In fact they had wholly failed. If the gasholder had been somewhat smaller, or somewhat further from the plaintiff's land there was no reason for supposing that it would have interfered with his right to light or to support. And beyond all this it was a mistake to say that an absolute power to do such things as such rights or powers as were conferred upon the defendant company, so far from being absolute, as was asserted by counsel, were very strictly limited and guarded. His lordship accordingly granted an injunction, but it was not to prevent the company from raising their gasholder on its north side to the height of 68 ft. from the surface of the ground. As to the interference with the support of the plaintiff's house, no injunction was now required, for there had been no further subsidence. His lordship also held that the plaintiff was entitled to damages for the injury which had been done, and which he assessed at £401. This, however, did not include any damage for interference with light, nor any sum in respect of damages which might arise hereafter in consequence of any future subsidence which would give rise to a new and separate cause of action. The injunction would issue against the company, and the damages would be awarded against all the defendants. There would be judgment against the company for the plaintiff's cost of the action, and against the other defendants for so much of the plaintiff's costs as related to interference with support and its consequences.

#### IMPORTANT POINT UNDER THE PUBLIC HEALTH (BUILDINGS IN STREETS) ACT, 1888.

JUSTICES MATHEW AND KENNEDY, sitting as a Divisional Court of Queen's Bench on the 10th inst., had before them the case of the Grand Junction Waterworks v. the Hampton District Council on a special case stated by Justices of Middlesex. On a summons against the appellants, the Grand Junction Waterworks Company, for committing an offence under the Public Health (Buildings in Streets) Act, 1888, by unlawfully, without the written consent of the respondents, erecting part of a building in Upper Sunbury-road beyond the front main wall of the building on either side thereof. The question for decision was whether the appellants were justified by their local Act in filling up the whole of a certain plot of ground with buildings or whether the later general Act of 1888 had been made applicable by Clause 93 of the local Act, and, therefore, prevailed over the other provisions of their local Act. The appellants, by the Act of 1882, were empowered to make and maintain works in the parish of the parish of Hampton in the plans and sections deposited with the Clerk of the Peace for Middlesex, and by Section 25 it is provided that the works should be completed within five years, with a proviso that nothing in the Act contained should restrain the company from extending their works whenever it should be necessary for the purpose of supplying water within the limits of their district. The company, in 1853, compulsorily acquired some land in the parish of Hampton, situated at the junction of a road leading from Sunbury to Hampton with the road leading from Staines to Hampton, the road being within the limits of the deviation marked on the plans. Upon this the appellants constructed works for supplying water. Since 1888 the west wing, consisting of engine-house, boiler-house, had been erected as an extension. In October 1897, the appellants, wishing to extend their works, proposed to construct an additional engine-house in connexion with their then existing boiler-house and submitted plans to the respondents, who decided not to allow the engine-house to be brought forward beyond the front main wall of the building on either side, and they accordingly disappeared the said plans. In October, 1897, the appellants commenced to excavate upon the lands upon the only site which was available without taking down an existing building, and to construct an engine-house. On March 7 last, the engine-house being then above the ground the respondents gave the appellants notice under the Act of 1888, to discontinue the offence against the provisions of the Act. The appellants contended that they were authorised by their special Acts to construct upon the land such works as were necessary for the purposes of their undertakings, and that they were, therefore, not prohibited by the general provision contained in the Public Health (Buildings in Streets) Act of 1888 from erecting the engine-house. The respondents, however, contended that the engine-house was, "without

reference to its position, necessary for the purposes of their undertaking."

At the conclusion of the arguments of counsel their lordships affirmed the conviction and dismissed the appeal. Mr. Justice Mathew stating that he saw no grounds for departing from the plain language of the section of the Public Health Act, 1888, which appeared to have been infringed.

The appeal was dismissed accordingly.  
Mr. Soudouque, C.C., Mr. Macdonald, C.C., and Mr. R. Cunningham Glen appeared for the appellants; and the Right Hon. H. H. Asquith, Q.C., and Mr. Courtthorne Munroe for the respondents.

#### MEETINGS.

MONDAY, AUGUST 15.

*Institute of Sanitary Engineers.*—Council Meeting at 5.0 p.m., at the Office of the Institute, 63 and 64, Chancery-lane. Special General Meeting at 7.0 p.m., in the Arbitration Room, 63 and 64, Chancery-lane.

WEDNESDAY, AUGUST 17.

*Builders' Foremen and Clerks of Works' Institution.*—Ordinary Meeting of the Members. 8 p.m.

#### RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until September 20.

[1897.] 16,892.—INDICATING THE MOVEMENT, OR CESSATION OF MOVEMENT, OF A FLUID: *O. & J. M. Carpenter.*—The invention lies in the employment of a magnetic needle, the tip of which is pivoted to a magnet arranged that the body may come within and leave the field of the magnet to cause a disturbance thereof. The device may be used also as a low-water alarm for boilers, and the magnet may be used to release a clockwork for actuating an alarm.

16,931.—CONTINUOUS PRODUCTION OF COMPOUND METAL SHEETS, PIPES, &c.: *J. J. Atkinson.*—The process consists in leading metal in a suitably prepared wavy or interlaced wire through a pot containing molten lead or other fusible metal or alloy and drawing it through a slot and between dies or moulds provided with water-jackets; or pipes the dies are fashioned of suitable shape and rollers and guides are arranged for moulding.

17,482.—ACETYLENE GAS GENERATORS: *N. Reggiani & A. Christl.*—The novelty consists in arrangements whereby (1) the water enters directly and automatically into the generators through the action of a cone or other floating body, or by means of a spiral spring fitted to the axis of the bell's pulley; (2) the water in its course consumes all the carbide of calcium from the bottom upwards by means of perforated diaphragms; (3) the closure of the generators with lids is such as to render the apparatus inodorous; and (4) the education pipes have safety valves in the case of an excessive production of gas.

15,377.—ELECTRICAL CUT-OUTS: *H. Hirt.*—To isolate the point of fusion on an excess of current is employed a base of china or other suitable material on which is formed a hollow boss screwed into a similar domed cover; the terminals are fixed upon opposite sides of the boss, and the wires pass through its cavity; ribs or webs projecting radially from the boss intervene between the terminals; ventilating orifices in the domed cover will enable the escape of vapour resulting from fusion within the cavity whilst any metallic globules in a state of fusion are retained.

13,989.—PRODUCTION OF CALCIUM CARBIDE: *H. Maxion & W. H. Graham.*—A number of electric currents enter the furnace through separate electrodes, and thence to one common electrode; heat is produced by means of either an electric arc or a core placed between each of the separate electrodes and the common electrode, and raised to great heat by its resistance to the current; the electrodes are also electrically connected, so that the current enters the furnace through one or more of the separate electrodes to the common electrode and back through the remaining separate electrodes. For the last-named contrivance are claimed several advantages: (1) it requires half the quantity of leads used in any other system; (2) dispenses with all outside connexion with the common electrode, and allows the same to be made much smaller; (3) permits the current through the same to be broken without causing any appreciable alteration in the current through the others, and admits the use of a higher and more economical furnace.

19,015.—SAFETY FASTENERS: *W. E. Isom.*—This fastener has a bed-plate in two portions, whereof one has a stop or pin with an enlarged head, and the other has pivoted on to it a flat plate, containing a cam slot so arranged that on turning the plate and bringing part of it over the other portion of the bed-plate, the pin enters the slot.

20,809.—WATER TAPS: *J. Macnaughton.*—The invention is intended to provide a tap whose spigot or turn cock is locked in the closed position by the water pressure, and wherein the recoil from sudden closing is prevented or minimised; the water channel in the stem and barrel is cut eccentrically, or nearer one side than the other; in the spigot's ground face a recess is cut in such a position that when the spigot is turned to shut off the flow, it comes opposite the channel in the barrel on the pressure side; one face of the recess has a greater area than that of the other, and the water pressure tends to turn the spigot in the direction for shutting off the water; on opening the tap the cavity retreats full of water that is discharged through the wedge-like one side of the barrel whilst the other is running; it is empty and ready to act as a recoil chamber when the tap is closed.

21,160.—VITREOUS DECORATION OF WALLS, PANELS, AND OTHER SURFACES: *H. J. Pearce (of Waller & Pearce, Limited).*—The design is cut from plain or coloured transparent or translucent glass having an uneven surface, the parts are stained, the even or smoother side of the glass is coated with metallic foil and cemented upon a foundation in such a manner that the metallic surface is at the back of the decoration. For leaf metal aluminium is preferably employed; the cement is composed of balled oil, burgundy pitch, and red lead, manganese dioxide (black), and whitening or chalk.

21,185.—GULLEY OR STENCH-TRAP: *J. Johnson.*—As an improvement upon his gulley-trap under Patent 10,223,

1896, the inventor either carries the central seal-water chamber by the cover-plate or uses, in its stead, a U-shaped casing attached to the cover-plate's central pipe, which hoods over the end thereof and forms a trap with the pipe, the outlet being uppermost and the construction being similar to a duplicated siphon-trap.

21,426.—LAYING DRAIN-PIPES: *T. T. Haylock.*—To facilitate the mending of defective joints, holes or spaces are formed in the concrete bed at every joint of the pipes when the bed is being laid by inserting moulds which may be either in the form of baskets, and perforated, to become part of the concrete mass, or in the shape of blocks to be removed before the concrete becomes set.

[1897.] 9,523.—ARTIFICIAL STONE: *C. Schoenfelder.*—The admixture is formed of silica, kaolin powder, sulphate of lime, glass, and fluorite, in varying proportions; for burning, a special furnace is contrived, wherein the gases pass through passages in the walls, and playing round the burning chamber, are mixed in another chamber with air and oxygen before they enter the burning chamber, so that a clear flame rich in oxygen passes through the latter when the furnace is burnt with an open fire.

9,814.—LOCKS AND LATCHES: *C. H. & A. M. Tines.*—A circular disc, having its outer edge bevelled in one direction all round, is fitted within a lock case, so that it stands on its edge upon an inclined plane, and therefore continually tends to roll forward to its lowest position; the disc has a hole in its centre, by means whereof it may be rolled back to its highest position within the case by inserting the finger. When the disc is in its lowest position setting the finger, which is pivoted to the doorpost, so that a part of it projects to engage with the doorpost, it can then be locked by a lever to be moved by a key.

13,446-7.—EXPANSIBLE DRAIN PLUGS OR STOPPERS, AND APPLIANCES FOR USE THEREWITH: *J. G. L. Burn.*—To facilitate the plugging of drains is devised an expandible plug which has a spindle extending above the plug's axis; the stopper is composed of two plates (between which is an india-rubber ring), a screwed tube or spindle in combination with a nut on the spindle's screwed end, bevel gear teeth on the nut, a toothed pinion gearing with the nut wheel, and a spindle to carry the toothed pinion. For supplying stoppers, such as are composed of inflatable bags, to drains delivering into traps of the "Buchan" type, is contrived a metal rod having a clip at its lower end for attachment to the bag, and having its upper end screwed for the attaching of an ordinary malacca drain rod; on the metal rod are projecting guides to receive an operating rod capable of motion parallel thereto; the operating rod is screwed at its upper end for malacca drain rods, whilst its lower end is bent somewhat and pivoted to a connecting link, which is pivoted to a lever arm, which is jointed at one end to the metal rod.

#### NEW APPLICATIONS.

July 25-30.

16,135, Niblett & Sutherland, Electrical Heating Apparatus. 16,139, J. Thompson, Pounding, Crushing, and Pulverising Clay and similar material. 16,151, Kershaws, Whirling Clay and similar material. 16,152, C. D. Circular-Saw Fence. 16,157, Lingard & Pacey, Union Joint. 16,171, J. E. Hill, and 16,223, W. & E. T. Fitch Co., Window-sash Fasteners. 16,173, La S. A. des Ciments et Plâtres de Vilvorde, Belgium, Portland Cement. 16,178, A. Gray, Removal of Scale from Brazed Articles. 16,184, Schneider & Smith, Kilns for Burning Portland Cement. 16,187, W. Gurtler, Expanded Metal for Constructional Purposes. 16,207, D. J. Dickinson, Key Guards or Holders for Locks and Latches. 16,203, R. Allan, Automatic Window Lock. 16,215, J. Twigger, Steelyard. 16,217, Spences, Treatment of Sewage. 16,225, J. Boardall, Weather-bar for French Windows. 16,226, C. D. Richards, Locks and Latches. 16,234, R. J. Moss, 16,366, Billie & Drivet, 16,457, H. R. Berger, 16,479, Williams & Clarke, 16,487, J. S. Legge, and 16,559, R. Williams, Generation of Acetylene. 16,238, M. Marchant, Expandible Plugs for Straight-way Valves. 16,241, J. Wagner, Self-closing Door Hinge. 16,242, A. J. P. Frichard, Burglar-proof Safes and Screens. 16,257, J. R. Garner, Starting Switches and Regulators for Electric Motors. 16,261, B. A. Mordaunt, Sliding-Window Sash Fastener. 16,270, C. Chapman, Joiners Cramps. 16,271, R. Eberlein, Calculating Apparatus. 16,278, R. L. Morgan, Screw Taps and other Tools and Tool-holders. 16,284, W. H. Coe, for applying Metallic Leaf for Decorative Purposes. 16,286, B. C. Battchell, Pipe-boring Machine. 16,288, E. D. Richards, Polishing Wheels. 16,295, W. P. Riss, Moulding Pottery. 16,300, M. Kohl, Alternating Current Transformer. 16,311, W. Lindemann, Smith's Hearts or Forges. 16,317, Moore & Karr, Anstey's Gas Lamps. 16,319, Sir John Benjamin Stone, Knt., Apparatus for Excavating, Mining, Quarrying, &c. 16,324, L. L. Morane, Shrinking Hoops around Pipes, &c. 16,334, M. Cramby, Pattern Cutters. 16,335, R. C. Staley, Kilns for Earthenware Fireclay Goods, &c. 16,347, W. Thorne, Treating Clay for Making Bricks, Tiles, &c. 16,345, G. H. Taylor, Bradaws, &c. 16,348, S. M. Rutnagur, Water-waste Preventers. 16,352, Macfadyen & Ferguson, Incandescent Electric Lamps. 16,358, Leggros, for Regulating Sky-lights. 16,359, E. Walker, Cold-lined Lead or Composite Pipe Connections. 16,378, E. Wulff, Reversible Stage for Theatres, Circuses, &c. 16,385, H. A. Olsson, Electrical Fire-alarms. 16,387, P. Kistner, for Indicating Deficiency or Stoppage in the Flow of Liquid Through Pipes. 16,401, W. P. Freble, Turning or Shaping Wood and other Materials. 16,410, I. Coombes, for Lifting, or the like, of Alexander, Brick-making and Pressing Machines. 16,417, H. Burridge, Kilns or Ovens for Firing Bricks, &c. 16,421, W. Muirhead, Manholes, Sludge, Mud-hole, and Similar Doors. 16,423, H. F. Atkins, Elliptic-grooves. 16,433, N. N. Haigh, Wood Moulding and Planing Machines. 16,439, E. Cooling, Bath-room Lavatory. 16,444, L. Renters, Water Wheels. 16,454, H. Boddy, Slating Roofs. 16,458, T. P. Levey, Hanging and Fixing of Blinds. 16,470, A. J. McLean, Tar Pavements. 16,476, T. R. Ablett, Drawing Boards. 16,486, G. F. Belling, Steel Cutter for Lead or other Soft Metals, Linoleum, &c. 16,489, W. Olshewsky, Artificial Stone. 16,499, G. G. Cawwood, Concrete Stove and Steam Generator or Vapouriser. 16,515, C. W. Carter, Lath Chucks. 16,522, R. H. Cunningham, and 16,523, H. Bremer, Arc Lamps. 16,524, R. M. Gloyne, Street or Road Gully with Double Water Trap. 16,527, Kites, and Ventilator. 16,550, A. J. A. Berthelot, Furnaces for Baking Enamels, Glassware, and Porcelain. 16,562, F. Frier, Dressing, Moulding, and Turning Stone, &c., with Circular Rolling Cutter. 16,563, O. G. Door Holders. 16,598, O. Hoffmann, Purifying and Humidifying the Atmosphere in Buildings. 16,604, C. H. Palethorpe, Roofing Slates. 16,611, G. T. Epstein, Fireplaces or Stoves. 16,612, G. B. Willbond, Wash Water Closet. 16,618, J. Gibbs, "Wood Fillers." 16,640, M. B. Church, Modelling, Decorating, and otherwise Working in Plastic Material. 16,651, H. C. Osborn, Safety Hook Clamps for



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Shops and Dwelling Houses ..	Fire, earth, Tornado.	Premium, 2500. . . .	Sept. 21
*Municipal Buildings, Fire Station.	Regate Corp. . . . .	Three from Insurance Co. (not stated)	Oct. 6
Police Office, & . . . . .			

## CONTRACTS.

[illegible]

### CONTRACTS—Continued.

[illegible]

### PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Architect Assistant.....	Brockton W. D. C.	\$3. 35. per week	Aug 10 <sup>th</sup>
*Assistant Surveyor (Temporary).....	Aylesbury U. D. C.	.....	.....
*General Foreman.....	Walthamstow W. D. C.	7. 10s. per week	..... do
*Clerk of Works.....	London Asylum Com.	\$5. 5s. per week	..... do
*Architectural Assistant.....	Hatfield Corp.	2. 10. per week	Aug 24 <sup>th</sup>
*Clerk of Works.....	Bethnal Green Vestry	4. 6s. per week	Aug 27 <sup>th</sup>

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, & viii. Public Appointments, pp. xviii, xix, & xxi.

Ladders, &c. 16,652, Georgina S. Browne, Decorative Coverings for Floors, Walls, &c. 16,669, The Berline Kunstdruck and Verlagsanstalt vormals A. & C. Kaufmann, Bricks and Tiles.

### SOME RECENT SALES OF PROPERTY

## ESTATE EXCHANGE REPORT.

July 27.—By ORGILL, MARKS, & ORGILL (at Masons' Hall Tavern).	
Kilburn.—Canterbury-rd., "The Brondesbury Avenue" p-h, at 583 York, f. r. 127, f. 1. 105f.	£2.91
Charing Cross—St. Mark's—p-h, at 105, f. 1. 105f.	4.35
of Lorne "p-h, f. r. 107, of. 5d.	4.35
Camberwell.—5 p-h, 7, Avenue-rd.; also "The Lord Clyde "p-h, and 1, Crownct-rd, f. r.	4.50
137f.	
By BELTON & SONS (at Masons' Hall Tavern).	
City-rd.—123, Britannia-rd., "The Queen's Head "p-h, at 574 York, f. r. 140f, with good will.	13.25
By NEWLAND, DAVIS, & HUNT (at Newport).	
Undy, &c., Mon.—Various enclosures, 43a. 3f.	
29 Pr. f.	1.85

Two copholes, enclosures, 9 a. 3 r. 30 p.	£44
A frehold cottage and 29 p.	118
BY HENRY DUKE & SON (at Bridport).	
Bridport (near) Dorset.—The Woolth Green Estate, 218 a. 0 r. 14 p., f.	10,100
BY HOOKER & WEBB (at Redhill).	
Horley, Surrey.—Enclosures of land, 10 a. 2 r. 22 p., f.	750
Christmas Farm, 13 a. 11 r. 26 p., f.	1,600
BY WOODHAMS & SON (at Hailsham).	
Pevensy, Sussex.—Enclosure of marsh land, 4 a. 2 r. 34 p., f.	215
Wickham, Sussex.—Enclosures of marsh land, 14 a. 1 r. 3 p., f.	510
Convent House holding, 7 a. 3 r. 16 p., f.	450
Brook Farm, 31 a. 0 r. 29 p., f.	960
Hurstmonceaux, Sussex.—Allotment fields, 13 a. 0 r. 9 p., f.	360
New Barn Farm, 45 a. 3 r. 0 p., f.	1,700
Stunts Green Farm, 100 a. 0 r. 16 p., f.	1,000
Stunts Farm, 100 a. 0 r. 16 p., f.	1,000
A frehold farm, 32 a. 0 r. 13 p., f.	350
Fareham Farm, 59 a. 2 r. 3 p., f.	510
Chiltham Farm, 52 a. 1 r. 28 p., f.	470
Chiltham Farm, 52 a. 1 r. 28 p., f.	470

July 28. By CHINNOCK, GALSORTHY,	
& Co. (at Manchester).	
Stot Graham, Cheshire.—A freehold farm, 16a.	L 176
Enclosure of land, 4 a. or 3 p. f.	15
o, Station-rd. and 5 a. 1 r. 32 p. f.	45
o, 7 a. 7 r. 9, Lostock green, f.	43
Moss Farm and Brook House Farm, 251 a. or	115
3 p. f.	20
Hill Farm, 12 a. 1 r. 32 p. f. (under	8
Manor of Holford)	2,005
Graham Farm, 49 a. 2 r. 36 p. f.	8
By                 Hempstead.)	
Emel Hempstead, Herts.—A freehold brickfield,	39
with 100 a. of garden, 10 a. of water, &c.	50
A freehold house and 4 a. 2 r. 9 p.	59
A freehold cottages	80
and 10 a. of garden, 10 a. of water, &c.	50
<i>Contractions used in these lists.—G.r. for ground-</i>	
<i>rent; l.g.r. for leasehold ground-rent; i.g.r. for</i>	
<i>improved ground-rent; g.r. for ground-rent; r. for rent</i>	
<i>of stock; l.c. for leasehold cattle; l.s. for leasehold</i>	
<i>mental rental; u.t. for unexpired term; p.a. for pen-</i>	
<i>sium; yrs. for years; st. for street; rd. for road; sq. for</i>	
<i>square; pl. for place; t. for terrace; cres. for crescent;</i>	
<i>a. for yard, &amp;c.</i>	





**ROUGHDOWN.**—For the erection of a house at Roughdown Meads. Mr. C. H. Row, architect. Quantities by Mr. J. Rockwood—  
 Brightman ..... £5,471  
 Horn ..... 5,294  
 Smith ..... 5,294

**WEST HAM.**—For making up Freeman's-road and other streets, for the Town Council. Mr. Lewis Angel, Borough Engineer, Town Hall, Stratford, E.—  
 R. Ballard, Ltd. .... £4,151 15 8  
 B. W. Glenn ..... 3,975 7 3  
 J. Jackson, Plasterer ..... 3,745 13 6  
 T. Adams ..... 3,663 10 11  
 G. Bell ..... 3,646 3 3  
 \* Accepted.

**SKIPTON.**—For the execution of water supply works, &c., for the Rural District Council. Mr. A. Rodwell, engineer, Skipton. Quantities by engineer—  
 J. Rowland ..... £1,795 12 3  
 Harley & Pickles ..... 888 5 7  
 J. & M. Hawley ..... 846 11 11  
 T. Young & Co. .... 811 0 0  
 T. Kassel ..... 764 1 0  
 \* Accepted.

**WEST HAM.**—For the execution of sewerage works, &c., for the Town Council. Mr. Lewis Angel, Borough Engineer, Town Hall, Stratford, E.—  
 R. Ballard, Ltd. .... £4,151 15 8  
 B. W. Glenn ..... 3,975 7 3  
 J. Jackson, Plasterer ..... 3,745 13 6  
 T. Adams ..... 3,663 10 11  
 G. Bell ..... 3,646 3 3  
 \* Accepted.

**SOUTHALL.**—For the erection of "Bricklayers' Arms" public-house, for Messrs. Sedgwick & Co., Watford. Mr. Chas. P. Ayres, architect, Watford—  
 H. Martin ..... £1,165 11 11  
 T. & S. Co. .... 1,139 11 11  
 A. & B. Hanson, Southall ..... £1,050 11 11  
 \* Accepted.

**WIMBLEDON.**—For making up Ridgway gardens and Edge-hall, for the Urban District Council—  
 J. Mowlem & Co. .... £1,386 11 11  
 J. Mowlem ..... £1,347 11 11  
 \* Accepted.

**STAMFORD.**—Accepted for the supply of broken granite, &c., at the Station yard, for the Town Council. Mr. Jas. Richardson, Borough Surveyor, Stamford—  
 Ellis & Everett, Barton Hill Quarries—  
 150 tons XX ..... 108 per ton.  
 100 tons XX ..... 96 0 0  
 Groby Granite Company—  
 90 tons XX ..... 108 per ton.  
 20 tons XX ..... 108 per ton.  
 20 tons XX, Chille Hill granite ..... 75 7 1/2 per ton.

**WIMBLEDON.**—For making up Ridgway gardens and Edge-hall, for the Urban District Council—  
 J. Mowlem & Co. .... £1,386 11 11  
 J. Mowlem ..... £1,347 11 11  
 \* Accepted.

### TO CORRESPONDENTS.

J. D., G. S. (below our Hall)—J. J. and M. W. C. and W. W. W. G. O. W. and T. H. C. (amounts should have been stated).  
 NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.  
 Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to the Editor; those relating to advertisements and other exclusively business matters should be addressed to the PUBLISHER, and not to the Editor.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances (payable to DOUGLAS FOARD, LONDON) should be addressed to the publisher of "THE BUILDER," No. 45, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (by prepaying at the Publishing Office, 10s. per annum or 4s. 6d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

**W. H. Lascelles & Co.,**  
 121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

**HIGH-CLASS JOINERY,**  
**LASCELLES' CONCRETE**

Architects' Designs are carried out with the greatest care.

**CONSERVATORIES,**  
**GREENHOUSES,**

**WOODEN BUILDINGS,**  
**Bank, Office, & Shop Fittings,**

**CHURCH BENCHES & PULPITS.**

ESTIMATES GIVEN ON APPLICATION.

## THE BATH STONE FIRMS, Ltd.

BATH,  
 FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
 FLUATE, for Hardening, Waterproofing,  
 and Preserving Building Materials.

## HAM HILL STONE DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
 (Incorporating The Ham Hill Stone Co. and C. Trask & Son The Doulting Stone Co.)

Chief Office:—Norton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

**SPRAGUE & CO., Ltd.,**  
 PHOTOLITHOGRAPHERS,  
 4 and 5, East Harding-street,  
 Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

**METCHIM & SON** (9, PRINCE STREET, ST. GEORGE'S WESTMINSTER)  
 "QUANTITY SURVEYORS' DIARY AND TABLES"  
 For 1898, price 6d. post 7d. In leather 1/- Post 1/4 [ADVT.]

**Ernest Mathews & Co.**  
 61, St. Mary Axe, E.C.

**SLATES, SLABWORK,**  
 Enamelled Slate,  
 Marble,  
 Permanent Green Slates.

WORKS:  
**Bow, London, E. and**  
**Aberllefenny, North Wales.**

BRANCH HOUSE:  
**37, Victoria-street, Bristol.**

**PILKINGTON & CO**

(ESTABLISHED 1838),  
 MONUMENT CHAMBERS,  
 KING WILLIAM STREET, LONDON, E.C.  
 Telephone No., 2751 Avenue

Registered Trade Mark,

**Poloncean Asphalte.**

PATENT ASPHALTE and FELT ROOFING.  
 ACID-RESISTING ASPHALTE.

WHITE SILICA PAVING.  
 SEYSEL ASPHALTE.

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT,  
 TEAK, VENEER, and TIMBER MERCHANT,  
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
 HATTON GARDEN, and 29, RAY STREET,  
 FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS DRY, AND FIT FOR IMMEDIATE USE.  
 Telephone No. 974 Holborn. Tele. Address: "SNEWIN, London."

# BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

### DIRECTORS.

**CHARLES CREMER, Esq.,** Faversham, Kent, Brick Manufacturer.  
**R. L. CURTIS, Esq.,** 120, London-wall, E.C., Brick Manufacturer.  
**GEO. H. DEAN, Esq., J.P.,** of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.  
**E. W. GOODENOUGH, Esq.,** 37, Walbrook, E.C., Brick Manufacturer.  
**A. J. KNIGHT, Esq.,** Rainham, Kent, Brick Manufacturer.  
**HY. PACKHAM, Esq.,** of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.  
**A. BUTTER, Esq.,** of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
**J. WILLSON, Esq., J.P.,** of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
**GEO. E. WRAGGE, Esq.,** of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—**E. J. COLEBY, Esq.,** 148, Gresham House, Old Broad-street, E.C.



## ILLUSTRATIONS.

"Ashorne Hill House," near Leamington.—Mr. E. Goldie, architect :—	
Principal Front; and Drawing-room.....	Two Single-Page Ink-Photos.
Fireplace in Hall, and Staircase; and Dining-room.....	Two Single-Page Ink-Photos.
Chancel Screen, All Saints' Church, Fulham.—Mr. A. H. Skipworth, architect.....	Double-Page Ink-Photo.
New Buildings, St. Paul's Churchyard.—Professor Banister Fletcher and Mr. B. F. Fletcher, architects.....	Double-Page Photo-Litho.

## Blocks in Text.

Exhibition Building, Brisbane.....	Page 164	Sketches of London Street Architecture. No. XXVII.....	Page 169
Queensland National Bank, Brisbane.....	" 165	South Entrance Door, St. Helen's, Bishopsgate.....	" 171
"St. Martin's Church, Canterbury." Plans.....			Page 174

## CONTENTS.

Brisbane.....	163	Ashorne Hill.....	173	General Building News.....	176
How to Become a Successful Contractor.....	165	Chancel Screen, All Saints' Church, Fulham.....	172	Sanitary and Engineering News.....	177
Notes.....	166	Nos. 76, 77, 78, St. Paul's Churchyard.....	173	Foreign.....	177
Architectural Societies.....	168	The Cambrian Archaeological Association.....	173	Miscellaneous.....	177
King's Weigh House Parsonage.....	169	Books Received.....	174	Capital and Labour.....	178
The Architectural Association.....	169	St. Martin's, Canterbury.....	174	Legal.....	178
Magazines and Reviews.....	170	Regate Municipal Buildings Competition.....	174	Meetings.....	179
South Doorway, St. Helen's, Bishopsgate.....	171	The Students' Column: Soud, Light, and Heat.—VIII.....	175	Recent Patents.....	179
Archaeological Societies.....	172	Obituary.....	175	Some Recent Sales of Property.....	179

## Brisbane.



LIKE all the other cities of Australia, Brisbane, the capital of Queensland, has suffered severely from the crisis of 1893, but on revisiting it after an absence of a few years the

effects are not so apparent as in some of the other capitals, for quite a respectable number of new buildings present themselves to the eye of the observer. It is probable that some of these were erected or arranged for anterior to 1893, and so give an air of progress not quite warranted by present conditions. But by all accounts trade is reviving throughout the colony, and an era of quiet but sound expansion is anticipated.

This is all the more satisfactory as, in addition to the crisis, severe floods afflicted the city, and almost the whole of the business section was under water, while in South Brisbane two-story houses were submerged and many swept bodily away. The havoc at the time was great, but of this little or no trace now remains except the temporary bridge and the fine new one, of which half is completed. This is a creditable piece of engineering work, and we understand the whole of it is of Colonial manufacture. When completed, there will be two roadways separating the traffic, both vehicular and tram, and two spacious footways. At the end of each footway is a well-designed arch of stonework.

But to return to the flood. Some amusing incidents are vouched for by good authorities. In Queensland most of the houses are of wood, framed together on the top of piles (locally called stumps) and kept from 4 ft. to 10 ft. above the soil. The stumps are each covered with a galvanised iron dish or "stump cap" to prevent the white ants penetrating into the house framing, and therefore when the flood came many were lifted off their stumps and floated away to sea. In one case a cottage was thus washed away, but another cottage was washed down at the height of the flood, lodged on the vacant stumps and remained fixed there when the waters fell. The owner of the land and stumps claimed the derelict cottage, as it was his

freehold. The owner of the errant cottage claimed his home. The dispute was settled for 25*l*, and each was satisfied, for the one got a new house, and the other could not remove it, whatever legal right he may have had. It is shown at the present time, and the proof of the truth of the story is that the new cottage is somewhat askew, and is 5 ft. larger each way than the old stumps. In another case at Ipswich it is reported that a cottage floated astride the roof of the Congregational Church, and so remained for several hours; and in Brisbane large vessels were floated into and left high and dry in the Botanic Gardens by one flood, and then floated off again by the second. To give an idea of the rush of waters it is also asserted that at Mogil Ferry, about six miles below Ipswich, the waters rose the enormous height of 97 ft.

There have been many proposals to cope with future downfalls, mostly by straightening the river and giving a more direct exit to the sea; but this means that Brisbane would be left without a river unless locked, and the expense and trouble of this frightens the Government and the citizens. An essentially modern scheme is to impound the flood waters up among the hills in a vast reservoir, and use it for generating electric power; but the question is, whether the game is worth the candle. Something, however, will have to be done, for as the city grows each great flood will be more destructive. Another, and even more necessary public work, is the drainage of the city. At present earth closets are universal, and a universal nuisance, for the climate is sub-tropical, and the odours pungent. Sydney and Adelaide are both sewered, Melbourne is in the hands of drainage engineers and contractors, so Brisbane will not lag far behind.

But it is time to consider the buildings, and foremost among those of recent date stands the fine pile of Government Offices facing the river and the new bridge. Commenced several years since, these buildings have been gradually extended, till now a good idea can be obtained of the general design and grouping, though a considerable time will no doubt elapse ere the whole block is completed. They occupy, or will occupy, a full city section, bounded by four streets, and are built of an excellent cream-coloured stone, which, so far, is standing well. Italian Renaissance is the style

adopted, and it is carried out with correct and, in parts, even refined detail. The most noticeable characteristic is the skill shown in grouping, and the effect of light and shade obtained by simple and natural means. The adoption of the somewhat commonplace arrangement of a rusticated basement, Doric ground story, and Ionic first story is not so satisfactory, but a little freshness is imparted to the upper story by the alternation of small and delicate pilasters in the lower portions, with the usual Corinthian in those that are higher and more accentuated. The centre of the site will be an open court, and this might have been made a charming feature, but probably for reasons of economy it is at present finished off in cement in the most vernacular style. The general sky-line is varied, but there is no striking feature, such as tower or dome, and it is improbable that any such is contemplated. The completed building will, therefore, lack piquancy, though it will probably possess quiet dignity, and suggest its purpose.

Continuing along the street towards the Parliament House, a row of picturesque but rather fussy dwellings, called "The Mansions," is very noticeable from the combination of red brick, white stone dressings and slated roofs, but they deserve credit as showing an honest attempt to treat verandahs constructively. The designer has, however, failed to realise that a good composition cannot be made by combining two totally diverse modes of treatment—the vertical and horizontal. One must dominate. In the present case the arcades of the ground and first floors are strongly horizontal in tendency, whereas the second floor features stick through vertically and make too harsh a contrast.

Turning down Charlotte-street a new building, St. Stephen's Catholic School, catches the eye, but painfully rather than pleasantly, for its light-coloured brick and painted cement dressings are about on a par with the lean and wiry pseudo-Gothic design. It is not even homogeneously bad, for the flanks and rear of the building are treated in the baldest builder's vernacular with wooden balconies of common type.

It is a pleasure to get back to Queen-street, the principal artery of the city, and note another new building of much more satisfactory design. This is the Queensland



Exhibition Building, Brisbane.

Investment Company's offices, a simple composition of three semi-circular arches on the ground story, with Doric three-quarter columns on the first story and Corinthian on the second. The deeply-recessed central archway on the ground story, with its wide, panelled soffit and wrought-iron gates, is particularly good, and the dark woodwork of the staircase hall, though free in design, indicates considerable thought and skill.

Another building worthy of notice is the Queensland Deposit Bank, at the corner of Adelaide and Albert streets. It is, however, cemented, like the majority of buildings in Australia, but the detail is original, and shows a combination of late French Gothic, corbelled window heads and arches, foliated pilasters, the sunk and projecting square bay windows, with round corners, popularised by Mr. Colcutt a few years ago, and large eaves filled with good cast ornament. This eclectic composition is modified and fused together into a fairly harmonious whole on Renaissance lines, and piquancy is secured by the addition of an effective turret at the angle.

The large, bald, and bare-looking Baptist Church on Wickham-terrace demands attention if only for its prominence, as from its commanding position it dominates the town. It is said to seat 800 and to have cost 15,000/. The seats are arranged in a semi-circle, radiating from the platform pulpit; there is only an end gallery at present, but from the two tiers of windows it looks as if galleries all round were contemplated at some future time. In its present condition the acoustics are not good, and as it will probably be many years ere greater seating accommodation is required, it is a very open question whether this mode of extension is desirable, especially in a sub-tropical climate. Externally, the principal feature is a solid-looking square tower, which, however, is wrongly placed,

being on the upper side of the site, so that the lines of the building fall away *with* the hill instead of contrasting with it. Plastered within and cemented without, flat and uninteresting in treatment, the building makes one regret that so fine an opportunity has been missed of erecting a striking and yet useful church for Nonconformist worship.

A short distance away, in Herbert-street, is the Servants' Home, founded by Lady Musgrave, wife of a late Governor of the colony. It is a building of irregular plan, carried out in red brick and cement dressings, wooden gables, and high pitched iron roofs. There is a good deal of picturesqueness in the composition, and the large angle block covered with an iron curved roof, and a look-out on the top, is an original feature. Over the central block there is also a *flèche* of ordinary type. The design is perhaps a little crude and forced in parts, but the general effect is rather pleasing than otherwise. To English eyes the corrugated iron roofs and cement dressings are an eyesore, but in a new country with limited resources one has to tolerate much that in the old country would be deservedly reprobated.

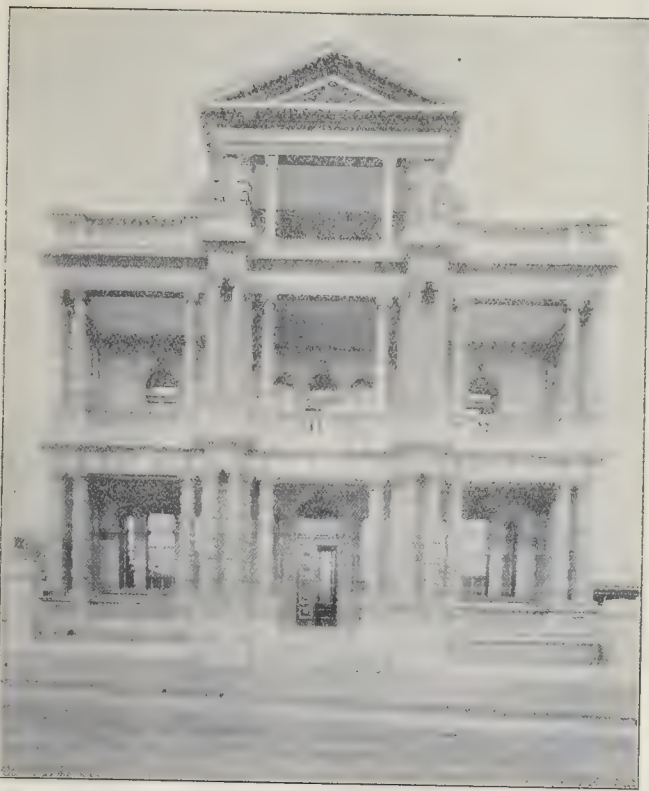
Farther away to the north-east, on a prominent site sloping towards the town and river, the Exhibition Building may be seen, and from a distance the effect is excellent. On nearer inspection, of course, the details show the cheapness that seems inseparable from this class of structure, but it is, nevertheless, a very creditable design and infinitely superior to those of Sydney, Melbourne, and Adelaide. The plan consists of two large naves at right angles to one another, in the shape of the letter T. The wing represented by the upstroke is shorter than the cross one, and is devoted to a very spacious concert hall of somewhat square form, with a gallery all round it, and a large platform orchestra and organ at the

rear. The other wing internally is simply a huge, bare brick exhibition hall, but as the flank of this overlooks the sports ground the opportunity has been seized to attach a loggia of dignified proportions, which will form a charming lounge and promenade. Externally the design is well studied, the ends of the nave being well accentuated. At the bottom end of the upstroke of the T there is a fine carriage porch, and at the right hand end of the cross stroke are the entrances to the Exhibition hall. Gables of moderate size diversify the flanks, but the roofing is the universal corrugated iron. A modern treatment of round arched Romanesque is the style that has been adopted, though in parts some crudities of Gothic origin make their appearance. But on the whole the building is one of which the inhabitants may be proud.

Returning to the town via Fortitude Valley, the branch office of the Queensland National Bank, with its bold loggia treatment of the front, is worthy of notice. There are two lofty stories of three bays carried up in red terra-cotta of very good quality, and the centre bay is carried up one story higher. The columns and piers are rusticated and fluted. The rustications to the columns are circular; if these had been made square, and the flutings omitted, the whole design would have gained materially in strength. The topmost story is the least satisfactory, looking weak under its heavy pediment. The main face of the building behind the loggia is carried out in cream-coloured brick, with cement dressings, but the flanks and rear are absolutely bare and bald, with no attempt at treatment whatever.

A little farther on, at Eagle Farm, a genuine Japanese house is to be seen, for it was designed and erected in the land of the Rising Sun, taken to pieces and shipped to Brisbane, and there put together again by





Queensland National Bank, Brisbane.

Japanese workmen. It was closed up at the time of our visit, as the owner was away, so we cannot tell what the interior may be like; but the exterior suggests a purely Australian rectangular plan with a detached kitchen. The all-round verandah was closed in by sliding shutters painted white, reaching to within about 2 ft. of the plate, this space being filled by lattice-work and glass. The verandah roof stops against the main walls, and the central block has a slightly higher roof. The roofs are quite straight, instead of being curved, but are covered with brown tiles, something like the Roman in shape but angular. The hips are formed with several layers of tiles and hence stand up prominently, while the lower ends are covered with what looked like repoussé bronze ornament of fine design. The eaves tiles are also beautifully modelled. Altogether, the house is a most refreshing change from the vernacular Brisbane dwelling, and it is to be hoped its artistic influence may be widespread, though, judging by the remarks one heard, it does not seem to have made much way at present.

Hence one gets back to the centre of the city, passing the Custom House on the way, and regretting that its fine dome has not a better substructure. Although passable in design (it is a two-storied building with fluted pilasters carried up the whole height), it is entirely coated with cement of the dirtiest and dingiest hue. Had it been in stone, and the details somewhat modified, it would have formed a picture worth looking at as one sails up the river from the sea.

Brisbane is, however, progressive. It has in many of its buildings done well, and since we last made a critical round of its streets it has done better, so that in its future buildings we may hope it will do better still, and become architecturally worthy of being the capital of a great colony.

#### HOW TO BECOME A SUCCESSFUL CONTRACTOR.

By ALEXANDER MACLACHLAN, ASSOCIATE MEMBER INST. C.E.



UCH is the amount of competition in contracting nowadays, and the complexity, intricacy, and great extent and diversity of work now attempted, that the art of successful contracting has become quite a scientific profession, requiring a liberal education, and calling forth all the best energy, knowledge, experience, sagacity, and skill to be found in the highest ranks of the enterprising contractors of the present day. A few hints from one who has had twenty-five years' experience of contracts and contractors may be useful to the young intending contractor.

The writer may be allowed to begin by observing that a good introduction into contracting on one's own account is to be a timekeeper, clerk, or cashier with a contractor; especially if this is coupled with the previously acquired knowledge and experience of a useful trade, such as a joiner, mason, or blacksmith.

An energetic, persevering young man, employed with a contractor for railways, water-

works, or docks, has a capital chance of successfully learning contracting. Many of the best known and largest contractors have had in this way their first training. Timekeepers, clerks, or cashiers get to know so thoroughly the ways, manners, and methods of workmen, their rate of wages, and their capabilities, and also of the prices of materials, plant, &c., that, although they are called timekeepers or clerks, yet they fulfil many duties pertaining to those managing the business of a contractor, and so gradually gain such a knowledge and experience as enables them, with a little capital and credit, to start for themselves.

There are many successful contractors who have once been joiners, masons, or blacksmiths, and some who have been in trades not at all constructive, who, through having a genius for such work, make a fair competency out of contracting. Some who have been architects and civil engineers succeed better as contractors, their experience being of great service to them. These last, it can well be understood, if they do not make much of a fortune for themselves, yet from their knowledge of construction and materials, turn out good substantial work for their employers.

The general knowledge necessary for the young intending contractor is extremely wide and varied. Many contractors send their sons, after they have passed through the university, for a year or two to civil engineers' offices, in order to learn a little of the technique of their profession or calling. This experience is of great use to young contractors in the future. They have a chance of getting a notion of setting out of work; of surveying and levelling and the use of instruments; and of plans, specifications, estimates, schedules of quantities, contracts, tenders, &c.

The whole knowledge required by the successful contractor may be summed up in: a knowledge of men, materials, and prices. He should be a man of great perseverance, energy, and endurance; honest, strong-hearted, and strong-minded; not to be set aside from his purpose by any number of obstacles. With a good name and possessing the above admirable qualities, he will be trusted with the capital of others and be given credit, which to the young contractor, unless he has a fortune of his own, is absolutely essential to him in making a first start in business. He must have a knowledge of all the latest kinds of machinery and plant, working economically, both as to price and saving of labour; of setting out of work, surveying, and levelling; of plans, temporary works, hoarding, fencing, staging, scaffolding, centring, roofs, sheds, workshops, stores, offices, and other buildings; of cofferdams and temporary bridges and roads; of the prices of implements and tools; of barrows, shovels, picks, pinches, jack-screws, rails, chairs, fish-plates, bolts, keys, points and crossings and sleepers; of tank-engines, trucks, wagons; of steam and hand-cranes, steam navvies, excavators, steam pumps, hand-pumps, pulsometers, turbines, centrifugal pumps; of stationary engines and boilers, and piping, and pile driving engines; and of dredgers, punts, lighters, &c. He must have a knowledge of materials, of concrete, rubble masonry, ashlar, and brickwork; of timber, planking, and creosoting; puddled clay, iron and steel work; freestone and flagstone, whinstone, granite, cement, lime, sand, and gravel; asphalt and

pavements, roads and streets, road metalling, macadam, causeway setts, kerbs, channels, wood-paving, drains, pipes, sewers, gully traps, manholes, ventilators, gratings, and covers.

He should know something of horses and what they can do, and of the cost of their upkeep, stabling, harness, &c.; of lorries, carts and carting, and how to buy and sell contractor's plant, materials, and stores.

Above all, he requires to have a knowledge of men and their ways. Not only of the workmen and officials in his employ, of the individuals comprising the companies, boards or trusts, of whom he has the contract, and of the staff of civil engineers or architects superintending his work; but chiefly of the foremen, or clerks of works under them. So much depends on the gentlemen last mentioned that the contractor would do well to enquire carefully who are to be placed in charge of the work in that capacity, as so much depends on their treatment how a contractor will come out of a contract. Some men are needlessly rigorous and exacting, and may ruin an honest contractor willing to make a good job. He must also have a knowledge of the engaging of workmen, and of the proper supervision of men in their work, and know how to keep them at it, and to retain the best workers.

To enable the young contractor to successfully fill up a schedule, in order to send in a tender for work, he should know all about quantities and prices. He should therefore study the taking out of quantities, study decimals, duodecimals, and mensuration, prime costs, rates and prices, wages and materials, and allowances and non-allowances in measurement of quantities of work. He should know something about railway rates, shipping rates, water rates, and of risks, lighting, watching and other contingencies necessary to allow for in making up tenders.

In sending in schedules, great care must be taken to ensure that nothing is forgotten to be inserted; that sufficient and proper rates are given; that the quantities are correctly stated, and that all allowances are enough, and that the extensions are correctly made, and added up, and the total amount of the tender just what the contractor can comfortably do the work for. So many mistakes which are merely clerical are made in tenders, often resulting in the loss of thousands of pounds, that too much caution cannot be exercised to ensure correctness.

He should know something of the law of contracts, and of the many conditions and clauses and restrictions under which he is obliged to execute work; of alterations and additions; of sub-letting, upholding, payments, assignment of plant in case of bankruptcy, delays or stoppages, disputes, arbitrations, cautioners, and how cases are conducted in court; of insurance of plant and of workmen against accidents, compensation, masters' liabilities for injury, protection of machinery, &c.

He must have a knowledge of the different materials found in the several localities in which he may carry on a contract; of the various quarries, and of what kind, quality, quantity, and materials they yield; of the brickworks, pipe-works, engineering shops, factories, timber-yards, coal depots, &c., of the districts or nearest places.

It is often said nowadays that an honest contractor cannot make a living, and that

contractors, who regard their reputation for good work, can now rarely take a contract; tenders being now so cleanly cut, and rates of materials so low. Consequently, contractors wishing to make an honest job, and to obtain a decent profit and living, are thrown out of all competition by others taking contracts at ridiculously low prices. This is often the case, but not always. There are some large contracts that by judicious management turn out paying concerns, even although the rates are very low. Contractors possessed of strong sagacity and foresight often foresee ways of making money out of contracts, though the rates are very moderate. For instance, ashlar freestone may be priced tolerably high in a contractor's schedule, and when doing the contract, he may get excellent stone on the ground, which is also paid for taking out as excavation. Similarly, he may be required to supply puddled clay for the backing of a wall, and may find suitable clay on the site of the works. When the contractors can see none of these likely ways of recouping themselves, they ought not to send in tenders.

A contractor's knowledge of the ground and locality can go a long way towards reducing a tender. A knowledge of access, of railway rates and roads, and of neighbouring works and manufactories—all are necessary to the contractor sending in a safe tender. Want of local knowledge often keeps a contractor's tender from being accepted. He either sends in a tender absurdly low or far too high for him to have a chance of success. It is not always the lowest tender that is accepted. The lowest tenderer may find that he is far too low with his estimate, and wisely retreats before it is too late. The highest tender is sometimes double the lowest that is accepted—double because of the want of skill or local knowledge of the tenderer, the want of a proper idea of the local prices of materials, or of the wages given in the locality. For instance, in regard to sand, he perhaps thinks the kind found in the locality will do, and prices accordingly; he finds that to be up to the specification quality he has to cart it from five miles off, or bring it a long distance by rail. The same with stone; local quarries, he afterwards finds, cannot supply the amount required for the contract, or the quality is inferior, or the prices are unapproachably high, so that he has to open another quarry miles away, besides making railway connexions to the main line.

When a contractor gets to be known as one who turns out good, substantial work—that he is honest, energetic, and enterprising—contracts will be given him almost at his own prices. When he is agreeable and easy to deal with, amicably settling disputes, and correctly and expeditiously doing his work, he has an immense advantage over the contractor who never does a job without blundering, or entering into needless disputes, or making himself disagreeable in some way or another.

On the other hand it must be said that contractors have many just grievances, which with greater care, forethought, and caution, and the exercise of greater skill and judgment on the part of those who superintend them in their work, might be greatly reduced. Contractors are often compelled, by young, incompetent assistant engineers or architects, to execute work in what they know very well is the wrong way for such work to

be done; this often causes the work to be needlessly delayed and brings the contractor into useless expense, which he cannot very well charge in his final account.

Before sending in his tender, the contractor should always carefully read the specification and conditions of contract. Some find, through neglect of this precaution, that they are asked to do such work or come under such stringent restrictions, that all profit is taken out of a job.

If occasion requires, a contractor should be able himself to measure up his own work, no matter how complicated or difficult, to check all quantities and accounts, and certify as to their correctness. He ought to be able to make estimates of the probable cost of any work he may seek to undertake; to correctly order all materials required, and to see that he gets what he ordered, and at the proper time. He ought to see, when a job is going on, that he has as many men engaged upon it as the work well requires, and to go ahead and carry it on without delay to the end.

As to the profits or incomes contractors derive from their contracts, this is a subject on which they are naturally very reticent. Some have confessed to making 1,000*l.* out of a 4,000*l.* job; and some, only one-third of the contract sum satisfies as profit. Others, again, are generally content with ten per cent. on each contract, and at times, if they do not lose, but make five per cent., they are tolerably well pleased. Five per cent. on a large contract, say of 300,000*l.*, is 15,000*l.*, which, if the contract takes five years to do, means, while it lasts, 3,000*l.* a year clear profit from one job alone.

As a rule, there is always plenty of room in any profession and calling for honest men who are not afraid of work, and contracting is no exception to the rule; and honest men with a little capital and determination, patience and perseverance, can still make something even out of contracting, and earn a livelihood and, perhaps, something more. When the possibility of an honest contractor ever existing is mentioned in certain quarters, the idea is often met, as the novelists say, with "derisive laughter," and cries of incredulity and unbelief. It may, however, be stated in conclusion that the writer has found many honest and conscientious contractors, who did their work most faithfully, and to the entire satisfaction of the engineers in charge. It is to be hoped that rising young contractors of the future will follow in their footsteps.

#### NOTES.

Malmesbury Abbey. THE Bishop of Bristol recently held a conference with the Vicar and Churchwardens of

Malmesbury Abbey, and the Mayor of Malmesbury, in regard to the undertaking of the repair and preservation of the Abbey, when it was agreed that the following work ought to be undertaken without delay: (1) to make sound and put in thorough repair the six bays of the ancient fabric now used as the Parish Church; (2) to render the interior more dignified as a place of worship (we are not informed what this proposal includes in detail); (3) to protect the ruined portions from further decay. The first and third proposals, it may be said, are of national interest, and public support and subscription towards them may be looked for; the second is more of local interest. Two other proposals, viz.,



to build out a chancel, and to rebuild the three western bays of the nave which are ruined, were negatived at the meeting, though it appears that it is intended to procure an estimate as to the probable cost of these works. As to whether these ought to be carried out or not is a question which depends mainly on the actual requirements of the modern congregation. On any other but practical grounds they would be indefensible. If however, the congregation is increasing and is too large for the existing portion of the nave, it seems better that the ruined portion should be rebuilt; but it is a kind of operation only to be undertaken on this ground and after careful consideration, so it is just as well, at all events, that it should be postponed for the present.

**Buildings for the Paris Exhibition.** THE Minister of Commerce has finally approved of the design submitted by M. Mewes, the architect, for the building for the congress and exhibits of the Social Economy section, to be erected on the Cours la Reine, with a front towards the river. He has also approved of the designs for the palaces for Forestry, Field Sports, and Fisheries, and for those of Navigation and Horticulture. The two former will be built on the quay on the left bank of the river, on either side of the Pont d'Iéna. The architects, MM. Tronchet and Rey, have designed effective models for these, with façades towards the Seine, broken up by projecting loggias. M. Gauthier, who has designed the Horticultural building, has contrived to give to this immense greenhouse, for such it essentially is, a certain degree of architectural character.

**The Architectural Association Lectures.** THE curriculum of the Architectural Association for session 1898-99 has just been published, and we are glad to note that excellent educational facilities continue to be offered to architectural students, and that the work of the last session is to be carried on in the main by the same able lecturers. The list of Visitors consists of over twenty of the most accomplished architects of the day, and students are fortunate in having an opportunity of working under their guidance. The lectures to be delivered at the ordinary general meetings of the Association are likely to be of more than ordinary value and interest, as will be seen from the following list:—"Excavations at Thebes," by Mr. J. E. Newberry; "Arts and Crafts," by Mr. H. Wilson; "Oriental and Bay Windows," by Mr. Paul Waterhouse, M.A.; "House Planning from the Esthetic Point of View," by Mr. H. H. Statham; "The Position of Architecture Among the Arts," by Mr. E. T. Hall; "Ancient and Modern Buildings in Palestine," by Mr. Beresford Pite; "Stained Glass," by Mr. Christopher Whall; "Colour Decoration," by Mr. Cole A. Adams; "Public Baths," by Mr. A. Saxon Snell; "Reflections on the English Renaissance," by Mr. Reginald T. Blomfield; "Modelling as Applied to Architecture," by Mr. F. W. Pomeroy; "Specifications," by Mr. F. W. Macey; and "Soil and Aspect in Relation to the Dwelling-House," by Dr. G. V. Poore. It is to be hoped that the attendances at the meetings will be large; they certainly should be.

Hampton Court and Wolsey's Leaden Pipes.

THE Office of Works are digging up, presumably for the sake of the silver they contain, the leaden pipes laid by Cardinal Wolsey for supplying his palace with pure water. For that purpose he collected the springs at Coombe Hill, about three miles distant, into conduits, with a junction near Kingston Lodge, whence the water ran in two pipes laid 3 ft. 6 in. below the ground to Surbiton, being conveyed across the Fair-field, beneath Hogg's Mill stream and through Woodbines, and thence across the bed of the Thames at a spot opposite the Swiss Cottage on the left bank, 780 yards above Kingston Bridge, and so through the Home Park to the Palace, wherein were many "baynes," or baths, and other conveniences. The rain and other refuse water he carried into the Thames through brick sewers, 5 ft. high and 3 ft. wide. The drainage served until 1871, when, in compliance with the requirements of the Thames Conservancy Board, a new system, withdrawing the outfall from the river, was devised. Five years afterwards, their sources having become contaminated with sewage from an adjacent farm and some buildings near Kingston Hill, the conduits were discontinued, and a new supply for the Palace was drawn from the Cardinal's (or Queen's) River, a branch of the Colne, the drinking water, separately carried, being filtered at New Hampton. Wolsey's leaden pipes were moulded in lengths of about 25 ft.; the seam and joint were made by an overlay. The two main pipes are nearly 4 in. in diameter, with a bore of about 2½ in. Their weight varies from 15 to 16 lb. to 1 ft.; it is estimated that about 250 tons of lead were used at a cost of 50,000*l.* (present money). Three conduit-houses are yet standing, but the old red-brick plug-house, near the footbridge between Denmark and Grange-roads, has been pulled down. The fall to the final trap (in front of the Palace) from the highest, or Gallow's-hill, conduit is 126 ft.; from the Coombe and Ivy conduits it is a few feet less.

Liability of Public Bodies.

THE case of Penney v. The Wimbledon Urban District Council, which is reported in the current number of the "Law Reports," may be regarded as a useful reminder of the legal position of public bodies in respect of work which they let out to contractors. In this instance the Wimbledon District Council had employed a contractor to sewer, level, and pave a road which was not repairable as a public road, but which the Council had thought to require the owner to repair, &c., and which, as he refused to do the work, the Council were entitled to take in hand. The contractor, in the course of carrying out his contract, turned up the surface of the road and left the material in heaps. The plaintiff fell over one of these heaps and was injured. Mr. Justice Bruce held that the District Council was liable for damages solely because they had some control over the work; and secondly, because, having employed a contractor to do work on a road which they knew was being used by the public, they had a duty cast on them to see that proper protection was afforded to the public. The case is a good instance of the position of public bodies, though there can be no question that the actual legal principle was finally decided in 1896 by the Court of Appeal in the case of

Hardaker v. The Idle District Council. The case again goes back to even broader principles, namely, that a person who orders work to be executed from which injurious consequences to his neighbours may be expected to arise must take all proper precautions. We reach, in fact, the common-sense maxim that a man must do his work without negligence.

**Obstructions by Public Works.** THE legal year which has just concluded has given us in its last days, in *Martin v. The London County Council*, a decision of some interest. The plaintiff sued the County Council for damages, because, as he said, he had suffered damage by reason of the Council having blocked up a street for the purposes of certain work, which street was at the end of that in which the plaintiff had his shop. The weakness of the plaintiff's case lay in the fact that there was not only no evidence that the County Council had carried on their work in an unreasonable manner, but also that he had not shown that he had suffered any special, direct, or substantial damage. In other words, public improvements cannot be done, as a rule, without some inconvenience to the public generally. Mr. Justice Kennedy distinguished this case without difficulty from a previous one, in which a hoarding had been kept up after it had ceased to be necessary. This comes to the same thing as saying that he could see no evidence of negligence. While it is no doubt desirable that public bodies should not be liable for damages when they are doing public work, unless a very clear case of having done special damage and acted unreasonably and negligently is made out, it must also be admitted that oftentimes the public is put to greater inconvenience than is necessary.

**Restrictive Covenants as to Buildings.** IN some ways it is difficult to follow the conclusion of Mr. Justice Stirling, in the case of *Holford v. The Acton Urban District Council*, but we will leave it to speak for itself. The Acton Local Board acquired land in High-street, Acton, for the purpose of widening the street. After this had been done some surplus land remained which had to be sold, and this was put up in several lots. The plaintiff purchased lot 2, and lots 3 to 7 were not sold, and subsequently the District Council, which had succeeded to the position of the Local Board, decided to erect a fire-engine station on lots 4, 5, 6, and 7. This seems straightforward enough. But the ninth condition of sale, when the plaintiff bought his lot, stated that the purchasers of lots 3, 4, 5, and 6 shall in their respective conveyances enter into covenants with the vendors to erect within two years from the day of sale, upon each of the lots bought by them, a shop and dwelling house of not less value at prime cost than 800*l.* To the ordinary mind this would certainly seem to imply that shops such as described should be built and maintained on the property. Mr. Justice Stirling, however, was of opinion that a purchaser might after the shops were built throw them into one building and use it for a purpose other than a shop. Therefore, he reasoned that he ought not to consider this a negative stipulation, and that accordingly the District Council were at liberty to build a fire station on these lots. We confess the reasoning seems too subtle, and we think



that the decision is rather a dangerous one, since a person might well buy property believing it would ultimately be in a street of shops, and he might find himself in a thoroughfare that was not a business one at all.

Mr. E. W. Wimperis is No. 47, Leicester square, appointed architect for the new premises which Messrs. Puttick & Simpson are about to build upon the sites of Nos. 47, 47½, and 48, on the west side of the square. Sir Joshua Reynolds bought No. 47 in 1761, removing thither from No. 5, Great Newport-street, which still stands, having been originally the central portion of a house since subdivided into Nos. 4, 5, and 6. He spent 1,500*l.* in improvements of the house. He built some stables, and a corridor and painting-room on the mezzanine floor at the rear. It is commonly said that the sale-room was Reynolds's painting-room, but that, we are authoritatively informed, is not the case. The painting-room, octagonal on plan and 15 ft. high, was removed for the large apartment built about sixty years ago by the Western Literary and Scientific Institution, and converted for their own purposes ten years later by Messrs. Puttick & Simpson on their removal from Piccadilly. Reynolds remained here until his death in 1792, when the house was occupied by the fifth Earl of Inchiquin and first Marquis of Thomond, who, in 1762, had married Mary Palmer, Sir Joshua's niece. Apart from its associations the house presents but few features of interest. The carved marble mantelpieces in the dining-room, now divided into offices, on the ground floor, and in the drawing-room above, together with the carved newels and the railings of the stone stairs up to the first floor, will be preserved. The stair-railings, of iron, and square in section, are belied out to afford more space for the ladies' hooped dresses. The property belongs to the Tulk family who have granted a lease of the site. The estimated cost of the new buildings is about 18,000*l.* When Reynolds settled in London on his return from Italy in the autumn of 1752, he occupied a house by St. Peter's-court, opposite May's-buildings, St. Martin's-lane, which he quitted for Great Newport-street.

OUR attention has recently been called to the neglect of quarry waste and Portland Cement. To turn their rubble limestone and limestone waste generally to profitable account by employing it in the manufacture of Portland cement, or at least a serviceable building cement. The utmost the average freestone owner can be got to do in this direction is to have samples of the stone burnt to see if it will make a good lime. One burning usually suffices to convince him either one way or the other. It hardly ever occurs to him that if the material fails to turn out a good rich lime the stone may yet be valuable for making cement. It very frequently happens that substantial clay deposits occur in the vicinity of the quarry, which, together with the limestone waste, might be employed in experiments for producing the cement. There is, of course, some difficulty in arriving at the proper proportions of these materials to be mixed together to get the best results. The limestone and clay should be carefully weighed (not measured) and several sets

made up in differing proportions, the effect of the burning on each being noted. The sets may be sent to a properly qualified cement-burner, who will probably be able to give a hint or two to the quarry-owner. The main cause of the failure of the experiments to produce a good cement is usually the want of proper preparation of the samples treated. Both the limestone and the clay must be ground exceedingly fine passing through several sets of stones for the purpose; when finished an impalpable mud should be the result. Then the cement-mud should be carefully dried before being burnt. After that has been accomplished, and good clinker produced, the latter has still to be ground very fine before its qualities as a cement can be properly gauged.

Decoration of the Panthéon, Paris.

THE interior decoration of the Panthéon at Paris will probably be completed in the early part of next year. The only portion now remaining to be completed is that which was entrusted to M. Puvion de Chavannes after the death of Meissonier, and which will be on the opposite wall to the composition of M. J. P. Laurens representing the death and obsequies of Ste. Geneviève. M. F. Humbert has just completed his paintings intended for the chapel of Ste. Geneviève, which include four compositions—"La Divinité et La Consolation," "La Famille et La Prospérité," "La Patrie et La Victoire," and "L'Humanité et La Devotion." In the centre of the chapel, in the place formerly occupied by the altar, will be placed an allegorical group in marble, by M. Mercier, representing "the Generals of the Republic"—a change certainly highly characteristic of modern France.

Proposed Municipal Buildings, Reigate.

THE advertisement of the Corporation of Reigate, printed in our advertisement columns last week, contained no suggestion of the absurd and preposterous conditions of competition referred to in our correspondence columns. The Corporation are prepared to spend 15,000*l.* on "the erection of municipal buildings, fire station, police offices, &c.," and, in order to secure designs, premiums of 50*l.*, 30*l.*, and 20*l.* are to be given respectively for the three designs which the "assessors" shall consider best in order of merit. Even if all the other conditions were satisfactory this in itself would be enough to deter a good many architects from competing, but when, in Condition 5, we read that the three successful designs shall become the property of the Corporation and that their authors shall have no further claim upon them, we feel that to the Corporation the response to their advertisement will be far from satisfactory. In that event the "assessors," who appear to be the Council, do not bind themselves to give the three premiums before-mentioned, "but only such as they may consider merited!" From another condition it will be seen that the Council, who do not guarantee to carry out any design, reserve to themselves the right "to modify, combine, alter or amend any of the prize designs which they may think fit, and in the event of any of the designs being carried out, no further payment will be made to the author." We should advise the Corporation to try again, for no qualified and self-respecting architect

will compete unless the conditions are very much modified.

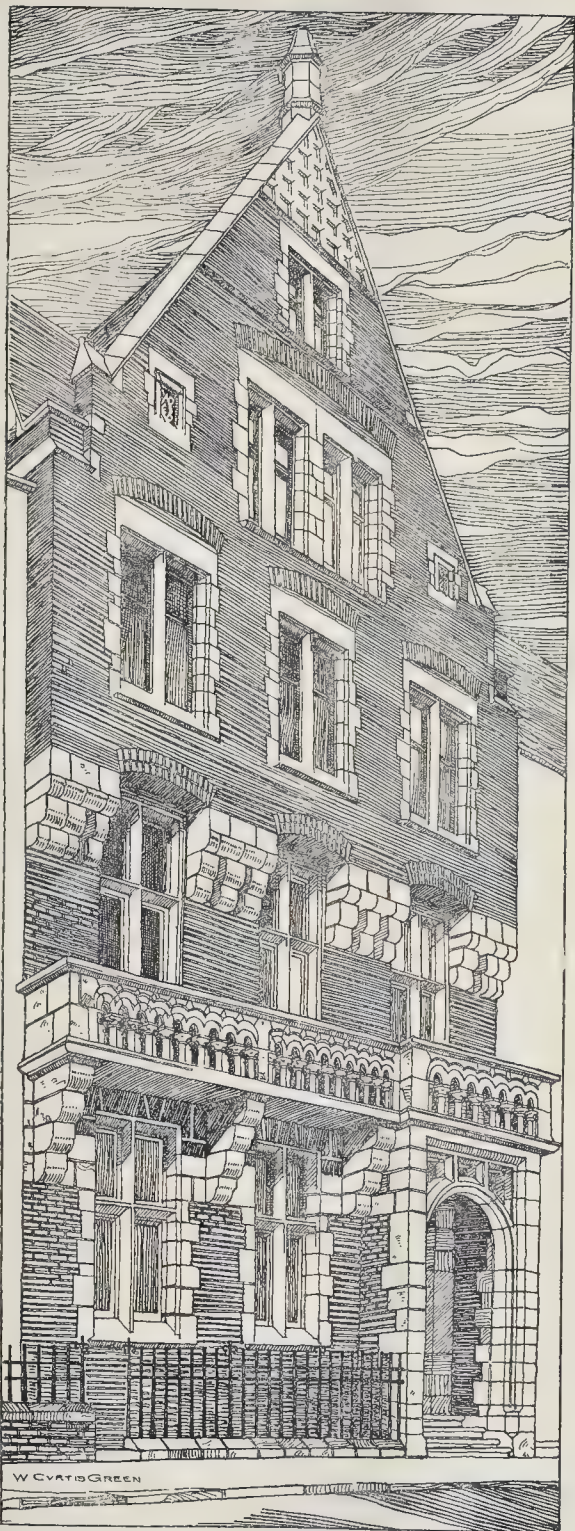
#### ARCHITECTURAL SOCIETIES.

LEICESTERSHIRE ARCHITECTURAL AND ARCHEOLOGICAL SOCIETY.—At the bi-monthly meeting of the Leicestershire Architectural and Archaeological Society, held at the Library, Old Town-hall, Leicester, Major Freer, hon. secretary, reported that a very successful excursion had been made to Bath and Bristol on June 30 and July 1 by twenty-six members and friends. He also read the correspondence that he had had with reference to the Roman pavement. The Town Clerk had informed the members that the Borough Authorities would do all in their power to keep the Roman pavement from being ruined by the wet. Major Freer also reported the discovery of a fresh Roman pavement near St. Nicholas' Church, at present only partly laid open, and asked the Society to pass a resolution earnestly requesting the owners, Messrs. E. Shardlow & Simpson, to preserve the pavement *in situ*. This was agreed to. Colonel Bellairs, hon. secretary, read the following notes on the Trinity Hospital in the Newark, exhibiting a plan of the ancient building:—"Some time ago I read a paper before this Society on the Trinity Hospital. I wrote it in anticipation of what is now decreed, that is, the destruction of the building, which, though much mutilated and altered, is the very extensive remains of one of the finest fourteenth-century halls ever existing in this country; and the recent destruction of the west end of the building has revealed the ancient plan very clearly. It was a large hall, consisting of a nave and side aisles, the nave being divided from the aisles by an arcade of sixteen arches on each side. At the east end was a chapel (or chancel) divided from the nave by a fine large chancel arch and screen. The side aisles were also screened off and divided into separate rooms for the hospital. At the west end were, as is usual in all old mediæval halls, three doors leading to the kitchen, butteries, and cellars, and over these doors was the minstrels' gallery—as is still seen in our Old Town-hall and many other old halls at our universities and elsewhere. I have never heard of a hall of the grand dimensions of this, which was a princely gift of the Lancastrian branch of the Royal family of England to the town of Leicester. This hospital was well endowed and cared for till the revenues were confiscated at the Reformation. As I mentioned in my first notice, this building was said by the misleading, if not false, inscription placed over the modern door, to have been rebuilt by George III., who, I dare say never heard of it, but it was only altered and the floor raised about 2 ft., and an upper story constructed for the women. At the same time two arches adjoining the chapel or chancel were taken down and destroyed, and the space converted into an open room something like a false transept, which forms with the chancel the present chapel. If the brick and mortar work of George III. were taken down, and the upper story removed so as to leave the arches and stonework visible and intact, it would show what it was, and sketches, drawings, and photographs could be taken. And better still, if it could be restored to its original state and converted into an extra museum, which will very soon be wanted, it would be one of the most interesting objects to be seen in Leicester. The present pointed doorway entrance to the chapel is original, though the mouldings have been destroyed—the ground outside having been raised about 3 ft., and inside 2 ft. When excavations are made no doubt the original floor will be discovered." Major Freer moved that Colonel Bellairs be authorised, on behalf of the Society, to take such steps as may be necessary to preserve drawings and plans, &c., of the old hospital. Mr. Hartopp seconded, and the motion was carried. *Leicester Advertiser.*

NEW HOSPITAL, ALFORD, N.B.—A new hospital for infectious diseases has just been completed near Alford, Aberdeenshire, from designs by Messrs. Jas. Duncan & Son, architects, Turin.

DRINKING FOUNTAIN, STOKE BISHOP.—The drinking-fountain erected in the village of Stoke Bishop to commemorate the Queen's Diamond Jubilee was opened by the Duchess of Beaufort on the 18th inst. The structure occupies a three-cornered site fronting the main road in the village, and the work has been carried out by Messrs. Cowlin & Sons, under the direction of Mr. C. A. Rowley, architect.





Sketches of London Street Architecture. No. XXVII.—The King's Weigh House Parsonage, Thomas-street. Mr. Alfred Waterhouse, R.A., Architect.

#### KING'S WEIGH HOUSE PARSONAGE.

THE house front in Thomas-street of which we give an illustration is that of the minister's house attached to the King's Weigh House Chapel, which was designed by Mr. Alfred Waterhouse, R.A. in 1889. Like the rest of the buildings, it is faced in red bricks and buff terra-cotta, and was built by Messrs. Shillitoe, of Bury St. Edmunds, the terra-cotta being supplied by Burmantofts, Limited.

#### THE ARCHITECTURAL ASSOCIATION:

TWENTY-NINTH ANNUAL EXCURSION: LEAMINGTON AND NEIGHBOURHOOD.\*

Wednesday.

THE third day of the excursion looked rather threatening for rain in the morning, but the excursionists were fortunate in suffering no more than the loss of the sunshine, for which the water-colourists of the party yearned, as although the sky was very overcast, the rain did not come down. The railway was utilised to get to Stratford-on-Avon, from which a long drive took the party to Honnington Hall, where the chief attraction was the Queen Anne house, now the residence of Mr. Frederick Townsend. Several alterations were made in the house towards the end of the 18th century, as is evidenced by an engraving of "Honnington Hall, in the county of Warwick, the seat of Joseph Townsend, Esq., M.P.," by Samuel and Nathaniel Buck, 1731. The alterations were made under an architect of the name of William Jones, and completed about 1765. The octagon drawing-room, the projection of which is shown to the left of the illustration in our issue for August 6, was then formed on the south-west front, with a portico in front of it, which has, however, since been moved and set up to form an open loggia in the garden. Under William Jones several new plaster ceilings and wall decorations were inserted which are excellent in design and execution, although decidedly French in feeling and rococo in motif. The estate of Honnington, or, as it is called in the Domesday Book, "Hynitone," at one time belonged to the monks of Coventry, but was for many generations in the possession of the Parker family, by whom the existing house was built. The house is a charming example of the later English Renaissance of early eighteenth century, or possibly even late seventeenth century date, and received much admiration from the members of the party, who seemed delighted with its bad proportions and coarse detail and sham windows. There is also a small formal garden with fountain, which, of course, came in for a considerable share of attention. The north-east or approach front is that to which the original designer of the house appears to have given most attention, together with the garden front shown in our illustration of August 6. The circular winged wall with columns and arches, which screens the stables on the right, was probably intended to have been balanced by a similar construction on the left, but this does not appear to have been carried out.

The church, which is in close proximity to the house is very interesting, and was rebuilt, with the exception of the tower, at the end of the seventeenth century by a member of the Parker family of Talton, Shipton-on-Stour. The interior is very pleasing, the nave arcade in particular being worthy of study. A new lych-gate, designed by Mr. Guy Dawber, adds to the attractiveness of the church and received its due measure of admiration.

So enamoured were the members of the charms of the later English Renaissance that the whole day was practically devoted to Honnington House, it being decided not to carry out the programme by visiting the village of Darlinscote. A short halt, however, was made at Tredington Church, dedicated to St. Gregory, which is mainly Transitional in character, with thirteenth-century chancel, and tower and spire, the steeple being of well-proportioned and graceful design—much of the tracery of Early Decorated character in the church, and particularly in the chancel, being especially beautiful. The clearstory of the nave is Perpendicular, together with the nave roof, on which traces of colour still exist, and other interesting Perpendicular woodwork is seen in the very good collection of fifteenth century

\* Continued from last week.



pews. The Perpendicular work was probably carried out during the restorations of Richard Cussy, whose brass bears the date 1427, and Henry Simpson, date 1482. A chained Bible and eighteenth century chair are amongst the curiosities in the vestry, and a good seventeenth century pulpit is amongst matters worthy of study.

#### Thursday.

Again the railway was utilised, and train taken to Solihull, from which station the party drove to the charming village of Hampton-in-Arden, where the first visit was paid to the church of St. Mary the Virgin and St. Bartholomew, formerly belonging to the abbey of Kenilworth. The chancel was built in the twelfth century, the nave and aisles in the thirteenth, the clearestory and tower in the fifteenth; but to the visitors the most interesting fact was the restoration which was carried out in 1878, under the direction of the late W. Eden Nesfield, at a cost of 3,543*l.*, and, as might be expected, is as admirable an example of what a church restoration ought to be as can be desired. The design of the organ case, built in 1884, deservedly received much admiration.

Amongst the noteworthy objects of interest in the church are a stone seat along the wall, the earliest form of church seating, a "Heart Shrine" of a Knight Templar, consisting of an Early English trefoil arch in the south wall of the chancel, enclosing an angel bearing a shield with two lions passant, the arms of the Erdington family. There is also a mutilated brass, which is probably that recorded by Dugdale as commemorating Richard Broke, Bailiff of Hampton-in-Arden, and Isola, his wife.

Close by the church and adjoining the churchyard is an old half-timbered farmhouse with a porch, surrounded by traces of a moat, which was formerly the manor house of the Ardens, and which proved the attraction for the water-courists.

From the church the party proceeded to Hampton House, the residence of the Right Hon. Sir Frederick Peel, P.C., K.C.M.G., by whom the visitors were received and shown the house. This was built originally by Sydney Smirke, but considerable additions and alterations were made by W. E. Nesfield, notably the clock tower, characteristically adorned with the signs of the Zodiac, dormers, and gables. The stables and lodge are also by Nesfield, as are several houses and cottages in the village. These, as well as some later work by Mr. W. H. Bidlake, make Hampton rich in some of the very best work of the present century.

Joined at Hampton by a contingent of the Birmingham Architectural Association on bicycles, the excursionists then made their way through typical Warwickshire lane scenery to Coleshill, where they were entertained at luncheon by the Birmingham A.A. A distant view only was all that the time permitted of the admirably proportioned tower and spire, built by Simon de Montfort, lord of the manor, in the reign of Henry VI., and most strikingly situated on the top of the hill about which the town is built.

From Coleshill the party drove on towards Birmingham, halting at Castle Bromwich, visiting first the house, built by Sir Edward Devereux, Bart., only son of Walter, Viscount Hereford, in the reign of James I. The estate was sold in 1657 to John Bridgeman, the ancestor of the present owner, the Earl of Bradford. Over the entrance porch, shown in our illustration\*, are the arms and monogram of Sir John Bridgeman. The house is, with the exception of the entrance, simply treated in brick with stone-dressed mullioned and transomed windows. Internally there is much that afforded the visitors material for study of eighteenth century detail, the principal staircase in particular coming in for a large share of attention. A notable feature of the house is the long gallery, of which the projection over the entrance porch forms an alcove or bay.

The next object of interest at Castle Bromwich is the Church of SS. Mary and Margaret, apparently a red brick and stone building of eighteenth-century English Renaissance, excellent of its date and admirable in both its internal and external aspects. An inscription records that "This Chapel was begun to be rebuilt the year of our Lord 1720, and finished in the year 1731." The somewhat peculiar wording of this inscription, as well as some vague traditions in the village, led Mr. C. E. Bateman to

make careful investigations. He has discovered that the eighteenth century building encloses a still existing earlier timber edifice, the original nave roof and clearestory still remaining, as well as the posts that formed the pillars of the nave, though now encased in plaster columns, with segmental arches between them. A capital set of drawings by Mr. Bateman hangs in the vestry, showing what still exists as well as a "restoration," in the French student's application of the term, of the probable original appearance. Little time remained for roaming through the village, as the excursionists, who by this time were reinforced by a large contingent of members of the Birmingham A.A., accepted the hospitality of Mr. Bateman, the father of Mr. C. E. Bateman, at the new house recently erected from the son's design, an architect's home in which the maximum of effect is obtained by skilful design at the minimum of cost. Leaving Castle Bromwich, the members drove to Acock's Green station, and so by train to Leamington.

#### Friday.

Once more by rail to Stratford-on-Avon, and then a long drive to Salford Hall, brought the members to the tit-bit of the excursion, at any rate in external grouping and colour, which lost nothing from want of sun on one of the most brilliant days of the present summer. The sketch in our issue for August 6 shows the entrance front, and over the doorway is an inscription, "Moderata Durant, 1662." The date is said to be a mason's error for 1602, but although this latter is nearer the date of the house, it is quite possible, from the character of the work, which appears clearly of a different stone to the main building, that the present doorway is a later insertion, and that the date is quite correct. The hall is within the manor of Salford Priors, bestowed in 708 by Kenred, King of Mercia, on the Abbey of Evesham, but it is not for this circumstance that the popular village name of the "Nunnery" has been given to the house, but rather to the fact that from 1808 to 1838 it was the asylum of some Benedictine Nuns, who fled from the troubles of the French Revolution. At the dissolution of the monasteries, Salford was granted by Henry VIII. to Sir Philip Hoby, and by him was sold to Anthony Littleton, who disposed of it to John Alderford, by whom the house was built. The high portion of the building on the left of our sketch is the end of a fine piece of composition towards the garden; a long front with three lofty bays carried up and finished with gables to the main roof. The lower buildings surround a small courtyard which contains some very picturesque grouping of stone and half timber.

On the way back to Stratford a short halt was made at Bidford, where a long string of eager sketchers made an attack on the old "Falcon Inn," where Shakespeare is said to have caroused "not wisely but too well." Some few of the party visited the church of St. Lawrence, of which the tower only is of interest, the church having been completely spoilt in the rebuilding of 1835. A glance at the picturesque bridge over the Avon, and the party returned to Stratford-on-Avon. Here the magnificent church of Holy Trinity, apart altogether from its presumptive connexion with the memory of Shakespeare, is of great architectural interest, the chancel especially being a remarkably fine example, both in design and execution, of late Perpendicular work. Then the Memorial Theatre, the work of Messrs. Dodgshun & Unsworth, was visited, and although criticised as being unsuitable in style to the *genius loci* of Stratford-on-Avon, was yet admitted to be a very meritorious design. The birthplace of the poet was glanced at by most of the members, although it was too late to see the interior, now utilised as a museum of relics connected with the poet and his times. Then by railway the party returned to headquarters, where in the evening the usual election of committee, display of sketch-books, music and songs heralded the close of the excursion.

#### Saturday.

The morning was devoted to a visit to the ruins of the grand castle of Kenilworth, interesting for its Norman keep, but still more for its association with Robert Dudley, Earl of Leicester, and the various buildings and historical connections of its successive owners, from Geoffrey de Clinton to Simon de Montfort, John of Gaunt, and Robert Dudley. Architecturally the most interesting portions are now

the great hall, built by John of Gaunt, and the gate house, built by Dudley. This latter has been altered to make a private residence and is still inhabited. The members were kindly permitted to view the interior, which they did with much interest. With Kenilworth the programme ended, and a very successful and enjoyable excursion came to a close.

#### MAGAZINES AND REVIEWS.

THE *Art Journal* has an interesting article on Norwegian wood carving, with a number of illustrations from photographs, which show the general form of the objects carved and the mass effect of the carving rather than its detail. A monograph on Reigale, illustrated from drawings by F. J. Kitton, gives us some idea of the picturesque character of this old Surrey town. Mr. C. R. Ashbee advocates the more artistic designing of challenge cups, shields, and trophies—a branch of metal work which we may truly say has been characterised more than any other, except, perhaps, personal jewellery, by an absence of art-feeling—an' illustrates his arguments by photographs of some very excellent work executed from his own designs. The Art Metal Exhibition, recently held at the Royal Aquarium, is also noticed, and illustrated with a certain amount of discretion.

The *Magazine of Art* has a memorial notice of the work of Sir Edward Burne-Jones, with illustrations from his pictures and studies, and an article on the Queen's treasures of art at Windsor Castle, with illustrations of art objects which, on the whole, may be taken as an antithesis to Mr. Ashbee's designs referred to above. Short notices of artistic bookbinding, stencil designs by Mr. Rottmann, and Mr. Gilbert Marks' silver work, all of which are illustrated, show the influence of the arts and crafts movement. This magazine also has an article on the metal workers' exhibition, by Mr. Starkie Gardner, the illustrations being of seventeenth-century and earlier work.

The *Illustrated Topographical Record of London* is the first series issued by the Organisation Committee of the London Topographical Society and contains illustrations of old buildings in London which were altered or pulled down during the years 1880 to 1887, and which are rather of antiquarian and topographical interest than architectural.

The *Artist* contains an article, with illustrations in line, of the rood screen and lectern of Ranworth Church, in Norfolk. The illustrations can hardly be considered as a complete record of the marvellous work which has been more completely performed in the Transactions of the Norfolk and Norwich Archaeological Society, but are sufficient to give an indication of the high character of the work to be found in the beautiful screen, whose pre-eminence in East Anglian colour decoration is scarcely challenged except by that of Southwold. Illustrating an account of art in Vienna is a view of the Romanesque west end and the upper part of the spire of the Cathedral of St. Stephen. An interesting but short account of the technique of Gothic wood carving is based upon demonstrations given by Mr. W. H. Grimwood at the South Kensington School of Art wood carving. Mr. Stuart W. Proverbs' lecture on design for wall papers is continued, with some illustrations. The Art Metal Exhibition has also a short notice.

The *Architectural Record* (New York) is very full of interest, commencing with a critical examination of the principles of architectural composition, a subject which we fear is by many designers too little studied at the present time, in which old and modern works are alike used to illustrate the points brought out by the author, Mr. J. B. Robinson. "A Study in Evolution, Persistence, and Reversion in Ornament Motives" deals with these characteristics of the trefoil and palmette, showing how these features have constantly found a place in decorative design from the work of Assyria and Egypt to the time of the Renaissance. Mr. Barr Ferree continues his account of French cathedrals, and in the current number deals with the domed cathedrals of Périgueux. Some interesting illustrations of examples of recent French architecture give an idea of the modern treatment of detail by Parisian architects at the present day. "An Architectural Experiment" is an account of an attempt to build a Japanese house in America. The result is instructive. "The owner has found it

\* See the *Builder* for August 6.



impossible to live in the West after a taste of Eastern civilisation, and is now a citizen of Tokyo. The house is dismantled of all its treasures, the rooms are empty, the little garden is running wild, and the bare shell alone remains, a forlorn relic of a delightful attempt to graft an alien civilisation on a tree grown weak with too vigorous life, and already showing signs of decay." Good things in modern architecture may, we think, be justly open to question.

In the *Antiquary* an account is given of recent excavations at Silchester, Cirencester, Andover, and elsewhere. Amongst other archaeological subjects of more or less interest to our readers are the continuation of Isabel Stuart Robson's account of hand-made lace, an article on "Bishops' Gloves," and another on the Shield Wall and the Schilttrun.

The *Engineering Magazine* has several articles of considerable interest to those connected with building, first amongst which we notice one on "Neglected Considerations in the Arrangement of Steam Piping," which is well worth careful study. An article on "The Heating and Sanitation of Public Institutions" gives an account in detail, fully illustrated, of the fitting up of the Brook Hospital on Shooter's Hill. Under the title of "Fire Resisting Construction—The Regulations in Force in London," Mr. Middleton points out how these affect the construction of buildings in general and places of entertainment in particular.

The *Essex Review* continues its accounts of Essex churches, that in the present issue being the church of St. Peter and St. Paul, Standon Massey, by Mr. Fred Chancellor, illustrated by his son, Mr. Wykeham Chancellor. Markshall, near Coggeshall, is also illustrated and described, with an account of the Honywood family and their connexion with the house.

The *Pall Mall Magazine* continues its series of monographs of old houses with "Huntercombe and its garden," admirably described and well illustrated; the garden especially being very fully dealt with. Under the title of "A Cotswold Village," we have a sympathetic account of typical Gloucestershire domestic work of which there is so much scattered up and down the slopes of the Cotswolds. There is a description also in this magazine of some of the Royal Plate at Windsor Castle with admirable illustrations.

The *Strand Magazine* has a description by Mr. Harry Turner Hems, junior, of the method of taking a cast from the living subject, under the title of "Making a Life Mask."

The *Gentleman's Magazine* contains an interesting historical account of Oxford, and an article on the Tudor Garden, which points out the virtual commencement of the garden as a place for pleasure and rest in England.

The *Quarterly Review* has an article on "The Spade in Prehistoric Greece," with special reference to Mycenæ and the influence which the discoveries there made have had upon our knowledge of ancient Greek life. Another article on "The Evolution of the Charter" is a capital introduction to the study of mediæval documents.

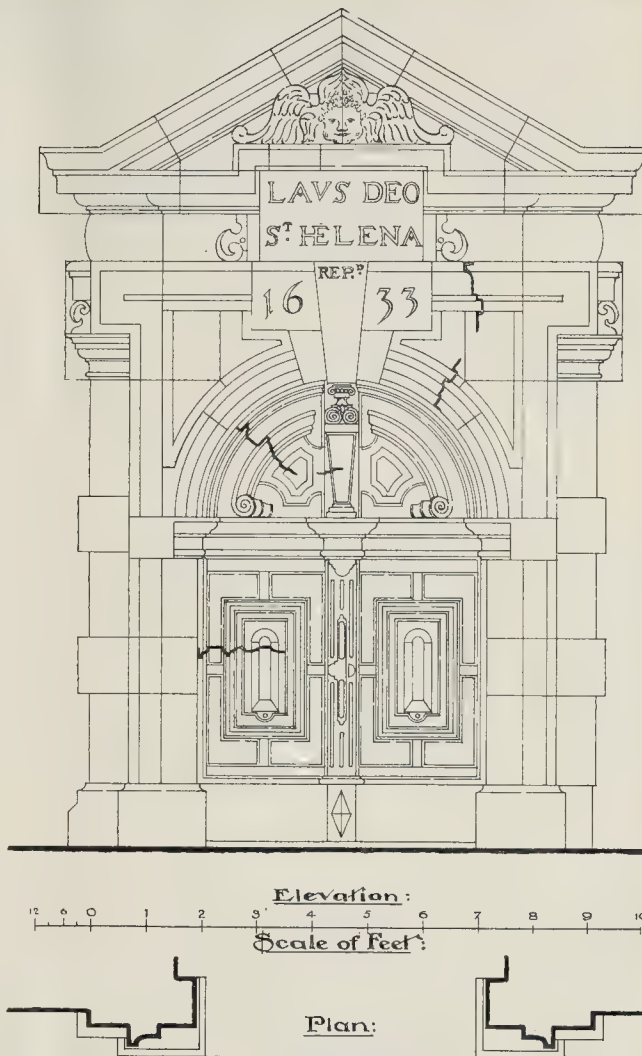
The *Century Magazine* has an account of the statue of Zeus at Olympia and the mausoleum at Halikarnassos, with an imaginary design of the approach to the mausoleum, thus dealing with two of the seven wonders of the world as recognised by the ancients.

#### SOUTH DOORWAY, ST. HELEN'S, BISHOPSGATE.

THIS doorway is believed to be a portion of the work carried out in 1631 under the direction of Inigo Jones, who was called in to carry out various repairs to the church, at a cost of 1,300l. The work done at this time included also the internal oak porches at the south and west, the pews, communion-rails, and a reredos, or "altar-piece," as it was called.

The doorway has been measured and drawn by Mr. J. G. P. Meaden.

OPEN SPACES.—The London County Council notify their intention, in pursuance of Section 19 of their General Powers Act, 1890, to apply their by-laws to Boundary Street-gardens, near Bethnal Green; to the land adjoining Victoria Embankment-gardens, next York-terrace (formerly known as Villiers-walk); to the Nelson Recreation Ground, Bermondsey; to Hely Trinity Church Garden, Rotherhithe; and the Pimlico Shrubberies.



South Entrance Door, St. Helen's, Bishopsgate, Measured and drawn by Mr. J. G. P. Meaden.

#### ARCHÆOLOGICAL SOCIETIES.

SUSSEX ARCHÆOLOGICAL SOCIETY.—The annual excursion of this society took place recently, when Ashburnham and Battle were visited. The programme had been arranged by Mr. H. Michell Whitley, the honorary secretary of the committee. At Ashburnham Place the visitors were received by the Earl of Ashburnham and conducted to the church, the archaeological treasures of which were exposed to view. These included the communion plate, and the parish registers dating from 1538. In memory of Jane Countess of Marlborough, who married into the Ashburnham family. An account of the church was given by the vicar (Rev. Charles Baker) who said there had probably been a church on the site from the eleventh century, though the present edifice was built in 1663. The special features of the architecture were the wooden mullions of the windows; the seven steps from the floor of the tower to the nave, and seven steps again from the nave to the chancel, gave the altar a very lofty position. In the hall at Ashburnham Place were to be seen relics of Charles I. The party were also shown Vandyke's portraits of the Duke and Duchess of Richmond, and other family por-

traits. From Ashburnham the party drove to Battle, and at half-past one sat down to luncheon in the Drill Hall, under the presidency of the Earl of Ashburnham. The next move was towards the Abbey, which was thrown open to the visitors by the Duchess of Cleveland. Something like a torrent of rain fell at this time, and Mr. W. H. St. John Hope, who had undertaken to describe the building, found it convenient to open his remarks in the shelter afforded by the gateway. The Abbey, he explained, was founded by William the Conqueror, as the tardy fulfilment of a vow made before the Battle of Hastings. The site was on the very scene of the battle, and the high altar was supposed to have been placed on the very spot where Harold's body was found. The later history of the abbey was practically nil, except such as was written on its stones, for though part of it had been destroyed, sufficient remained to enable them to put together a fairly intelligible story. The abbey he described as of the normal Benedictine type, and he identified the remaining portions of the building as the guest house, the refectory, dormitory, infirmary, &c., pointing out the special features of each. He particularly called attention to the fine gateway, the beautiful twelfth century work on the exterior of the guest



house, and the ruins of the dormitory. The principal points on the field of battle were to have been pointed out by Mr. W. A. Raper, but owing to the continuous rain this portion of the programme was omitted, and the archaeologists filed into the church, where the Norman font and the monument to Henry Anthony Browne, Master of the Horse to Henry VIII., were inspected. The Very Rev. Dean Currie gave a description of the church from the historical point of view. He thought it improbable that there had been, before the Conquest, a parish of St. Mary of the Wood, as had been said. The original Norman building, parts of which remained in the present church, was erected in 1187, as the monastic records showed, for the people of Battle, whose attendance at the church of St. Martin, in the abbey, had caused to the monks "certain inquietude, which they were unable to suffer without breach of order." Mr. J. Lewis Andre read an interesting paper on the architectural features of the buildings, and the party proceeded to the Deanery, where they were entertained at tea by the Dean and Mrs. Currie. Another drive took the archaeologists to St. Leonards, arriving at about six o'clock.—*Sussex Advertiser*.

### Illustrations.

#### ASHORNE HILL.

**H**IS house stands on a hill about five miles from Leamington, and commands views over Stratford-on-Avon, Warwick and its Castle, Chesterton Mill, said to be by Inigo Jones, and Edge Hill, where the quarries supplying the walling stone, of which the house is built, are situated. The dressed stone is from the Milton quarries, and this, though at first rather yellower than Bath stone, tones with the weather so that it harmonises well with the grey and brown of the walling. The tiles are local red ones.

The outside woodwork and that of the hall, staircase, gallery, and dining-room is of oak. The panelling of the drawing-room is painted. The ceiling was executed by Messrs. Jackson & Son, from designs by the architect. The carving of this room and throughout the house has been done by Messrs. Martyn, of Cheltenham.

The hall fireplace, which is 6 ft. high to the underside of the hood, is of Portland stone to the level of the height of panelling and above this of Beer stone. The two windows open into a small room with entrance from the gallery, and the front of the hood is designed to show the world with the waters under it and the heavens above.

The contractors were Messrs. J. Parnell & Son, of Rugby; the clerk of works Mr. Chappell; and Mr. E. Goldie, 31, Upper Phillimore Place, Kensington, W., was the architect.

The plan of the house and interior of the hall were published in our issue for December 14, 1895.

#### CHANCEL SCREEN, ALL SAINTS' CHURCH, FULHAM.

We have not received from Mr. Skipworth a description of this screen, and all we are able to say is that the drawing was exhibited in the Royal Academy this year.

#### Nos. 76, 77, 78, ST. PAUL'S CHURCHYARD.

THESE premises have been erected on the site of some old buildings which have been occupied by James Spence & Co., the well-known drapers, for fifty years. They have a frontage of about 70 ft. to St. Paul's-churchyard and a side frontage to London House-yard. The view is taken from the steps of St. Paul's Cathedral by the west door. The older premises were pulled down just before the Jubilee in order to make way for the large stand which was erected by Mr. Maskelyne, the seats being let out at large prices to view the Jubilee procession and the ceremony in front of St. Paul's Cathedral. The plan of the new structure calls for no special comment. It consists in the basement of the packing and country order rooms. The ground, first and second floors are devoted to show rooms, a portion of the second floor being used as a factory. On the third floor are the dining-rooms and on the fourth the kitchens and bedrooms. The building is fire-resisting through-

out: the interior is carried on steel stanchions, and the floors are of steel girders and coke-breeze concrete by Messrs. Homan & Rodgers. The principal staircase is of oak 2 in. thick, which under the London Building Act is taken as fire-resisting. The walls and ceilings are covered with asbestos plastering. As to the exterior, the façade above the ground floor has four projecting bays, the stonework of which is assisted by steel girders cantilevered over the main girders resting on the piers; at the top is a deeply-projecting cornice covering the bays and crowned with balustrade. Ketton stone has been used because it has been found to resist the London atmosphere. The mullions are fitted with the N.A.P. reversible steel casements. The design has been kept quiet and simple, the first, second, and third floors having no mouldings whatever. On the ground floor rusticated Ionic pilasters have been used. These support consoles carved with medallions representing Europe, Asia, Africa, America coming to do honour to the Queen's Jubilee. The centre console is carved with a head of the Queen. The consoles support sculptured lions supporting shields. The stonework has been executed by Messrs. Flint Bros., of Kensington. The rain water from the roof is collected into three large cast lead heads, and the square flat rain water pipes have ornamental eaves. The roof is covered with green Westmoreland slates in diminishing courses. The architects have attempted to grapple with the shop front difficulty by treating the space between the piers as lightly as possible, treating it as a bay window with a large amount of glass, so that the weight appears to come, as it really does, on the piers beneath the wall space. The electric lighting has been executed by Messrs. Sage and Messrs. Laing, Wharton, & Down. The shop front, of gun metal, is by Messrs. Francis to the architects' designs. Messrs. Sage & Co. are responsible for the shop fittings, Messrs. W. J. Fraser & Co. have executed the lifts and the heating apparatus. Mr. John Greenwood is the general contractor. The building has cost about 15,000l. The architects are Professor Banister Fletcher and Mr. Banister F. Fletcher.

#### THE CAMBRIAN ARCHEOLOGICAL ASSOCIATION.

THE fifty-second annual meeting of this Association was held at Ludlow during the week commencing Monday, August 8th. Though beyond the present bounds of Wales, the Cambrians, in fixing upon Ludlow, were not intruding upon the province of the two English archaeological societies, the marches of Wales having always been recognised as falling within the bounds of their activity; a tiny point in itself, but one not without its importance to the busy antiquary who wishes to turn to the particular set of journals or transactions likely to contain the information he requires with the least expenditure of time. The Association met at Ludlow forty-six years previously, and it may be interesting to record that of the members who then attended three were present last week. Lord Windsor occupied the presidency, which in 1852 was filled by his grandfather, the Hon. R. H. Clive, the author of the well-known work entitled "Documents Connected with the History of Ludlow."

The first excursion was taken on Tuesday morning, the 9th inst., the very sensible plan being adopted of commencing with the town and its immediate neighbourhood. The visitors proceeded to the Castle, where they were taken in hand by Mr. C. Fortey, the honorary curator of the local museum. Ludlow Castle has been the subject of a careful paper by the late Mr. G. T. Clark, reprinted in his "Medieval Military Architecture," and it is therefore unnecessary to attempt the quite impossible task of conveying an idea of the architectural characteristics of the building in the space at command. Suffice it to say that the castle was originally planned upon a somewhat larger scale than that ordinarily adopted in strictly Norman times. This was probably due to the favourable conformation of the ground, which admitted of the enclosure and fortification of a fairly large area, and the separate distribution of certain departments of an early castle that are ordinarily found united or in close juxtaposition. A further circumstance in the case of Ludlow is the unusually extensive additions and alterations which the requirements of suc-

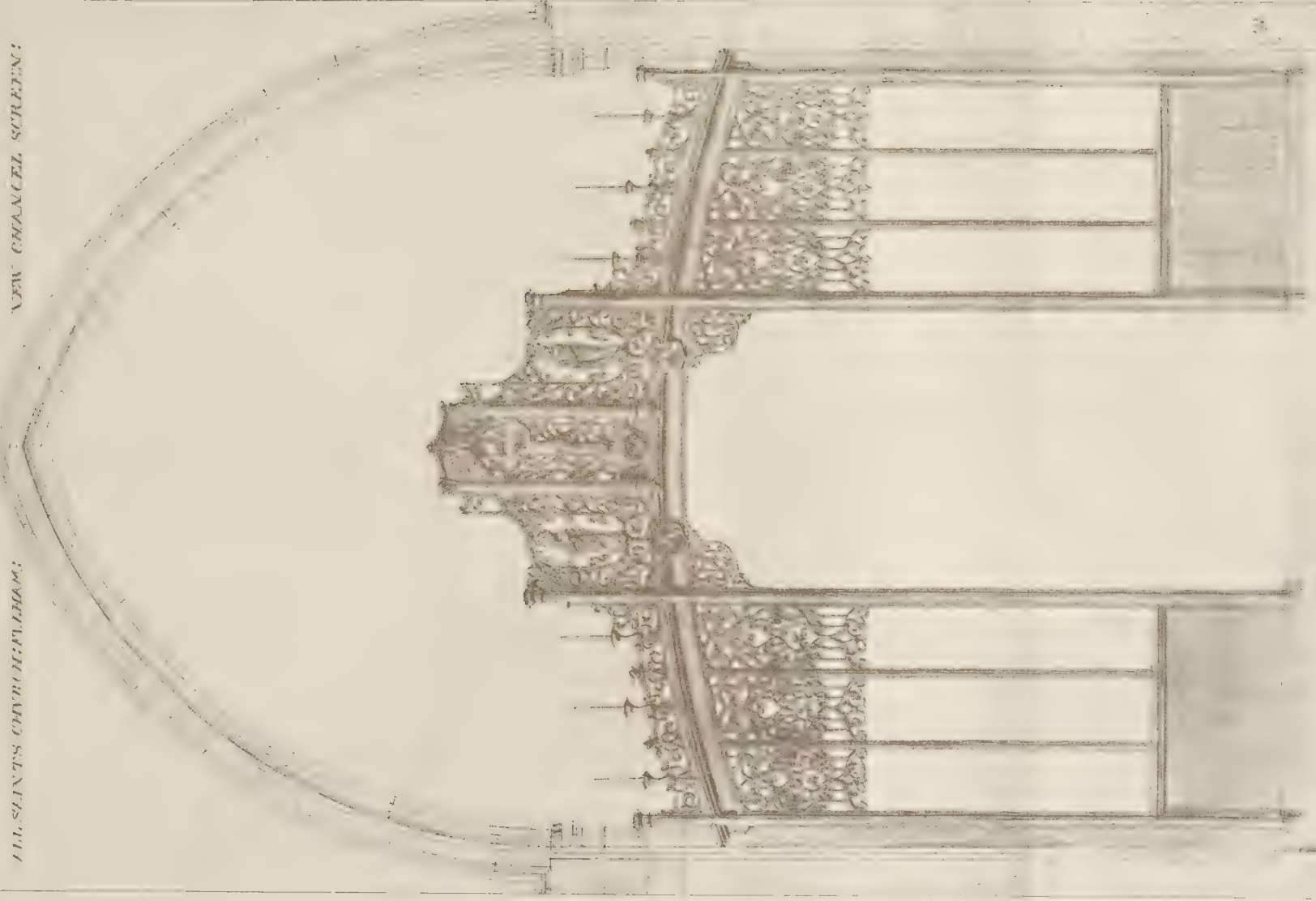
cessive generations have wrought in the original pile. It must be remembered that about the period when a number of castles were being deserted for more comfortable dwellings, or had been rendered useless for further occupation in the baronial quarrels of the first half of the fifteenth century, Ludlow Castle started upon a career of dignity that soon demanded large structural changes. The establishment of the Council of the Marches of Wales at Ludlow had no military significance whatever; it was a politic act of that most politic of sovereigns, Henry VII., and was intended as much as a centre of attraction for the nobles of the marcher district as a menace to the disorderly elements of society fostered and protected by the marcher lords. Ludlow became the centre of a small court, no doubt very much after the style of the court of Dublin Castle at the present day, and it may well be that with a wealthy and magnificent President of the Council, the earlier buildings of the Castle would be subjected to continual tinkering for the purposes of adapting features that suited the rude requirements of a Plantagenet noble to the more refined tastes of an exquisite of Elizabeth's spacious times. Thus the present ruins of Ludlow Castle range through successive stages of architectural progress and decline, and its long and unbroken history warns us against dogmatism too emphatically upon the date and the reason for many puzzling features that meet the antiquary in his survey of the pile. Next to the splendid keep, whose enormous strength has preserved its Norman form and principal features, modified in its upper floors in Decorated and Perpendicular times, the most interesting part of the castle is the chapel. This stands out in the centre of the middle ward. Internally it is 28 ft. in diameter, and is divided into an arcade of fourteen arches, seven on each side of the western doorway and of the eastern archway that once led into a chancel which was standing in the reign of Charles II. The present circular building, therefore, became the nave of a larger structure which united it to the eastern curtain wall. No traces exist from which the form of the original east end of the church can be conjectured. A drawing of the seventeenth century shows the chancel to have then had two Tudor windows in its north wall, and windows in the roof. Of no building is it more desirable to obtain its full documentary history than Ludlow Castle. Surveys made at different times are preserved in the Public Record Office, and it is sufficient to point to the changes effected in many parts of the castle during the governorship of Sir Henry Sidney (1560-1586) enumerated in a document quoted in Clive's "Ludlow" to make clear the necessity for further researches amongst the public records.

Much the same may be said of Ludlow Church, but here the chances of eking out the architectural history of the structure by contemporaneous documentary evidence are considerably less. The church, as well known as one of the finest in England, its extreme length being 203 ft., with a breadth of 130 ft. across the transepts. The tower, a magnificent specimen of Perpendicular, rises 130 ft. There first came a Norman church, which was followed by an Early English building, and traces of the former are said to be discoverable in the walls. The church is said to have been rebuilt in 1199, the string course at the west end and around portions of the transepts being of this period, as well as parts of the east wall of the chancel. Later on the north and south nave aisles were rebuilt, the tracery of the windows, which are extremely good examples of the Decorated style, being covered with the ball flower ornament. The transepts were also rebuilt during the same period. About 1450 large changes took place which transformed the church to, in the main, a Perpendicular building. The east window is a beautiful specimen of the style, kept, as was not always the case, within the bounds of grace and proportion. The glass is also extremely beautiful; it illustrates various incidents in the life of St. Lawrence, the patron of the church. There are two transeptal chapels. The northern, dedicated to St. John, has a baldachino or canopy of unusual height, and the glass is exceedingly fine. The other chapel is dedicated to the Virgin. Below the east window is a small window of more elaborate character than those generally found in this position. The porch is hexagonal, similar to, but earlier than, that of St. Mary



DESIGN FOR  
NEW CHANCEL SCREEN:

ALL SAINTS CHURCH, FULHAM:



J. H. P.  
1864

122 to 77 to 79 JAMES GARDYARD & Co  
 FROM BANIER, PICTOR, BE' MEY'S SE'ND  
 BANIER & PICTOR, ARCHT





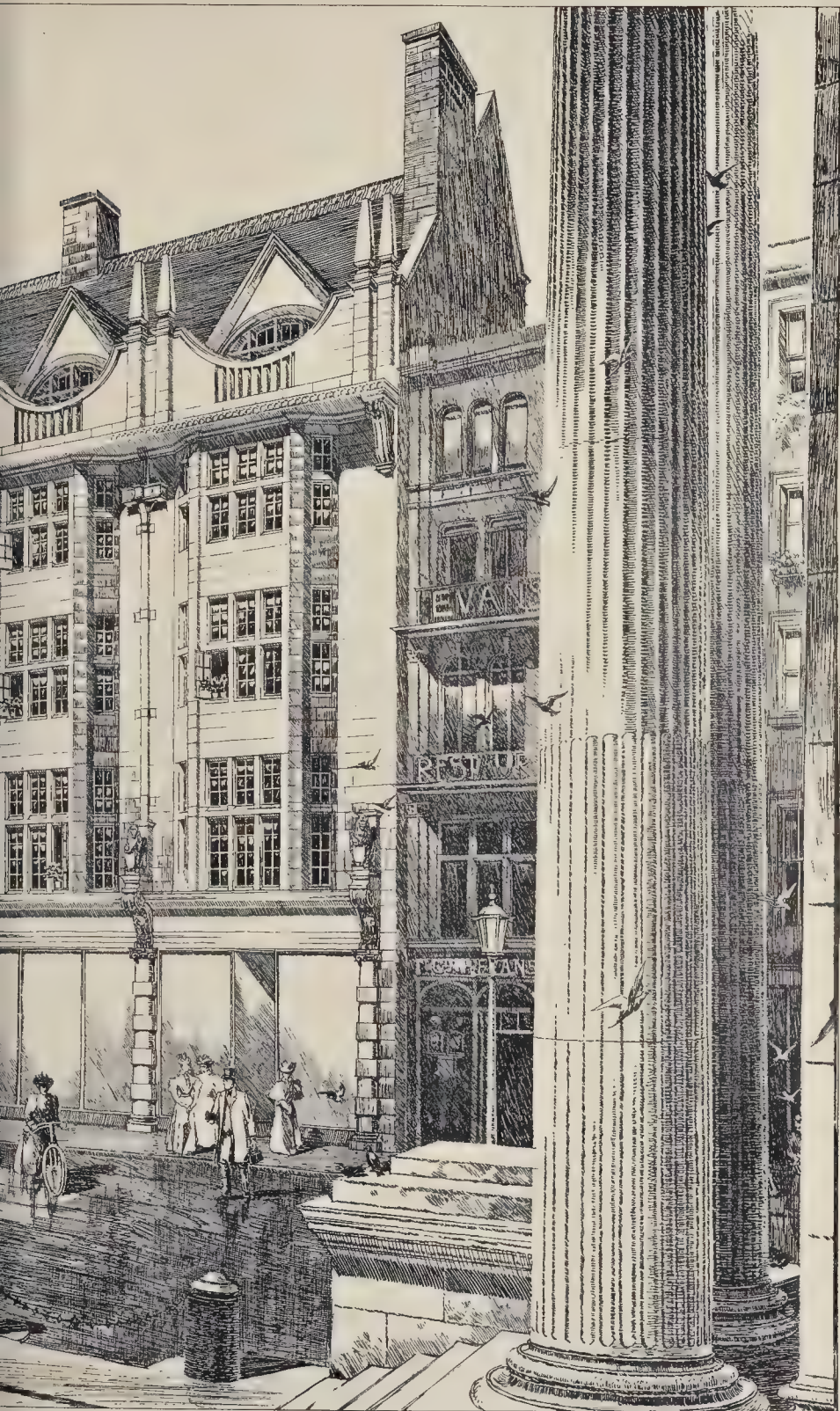
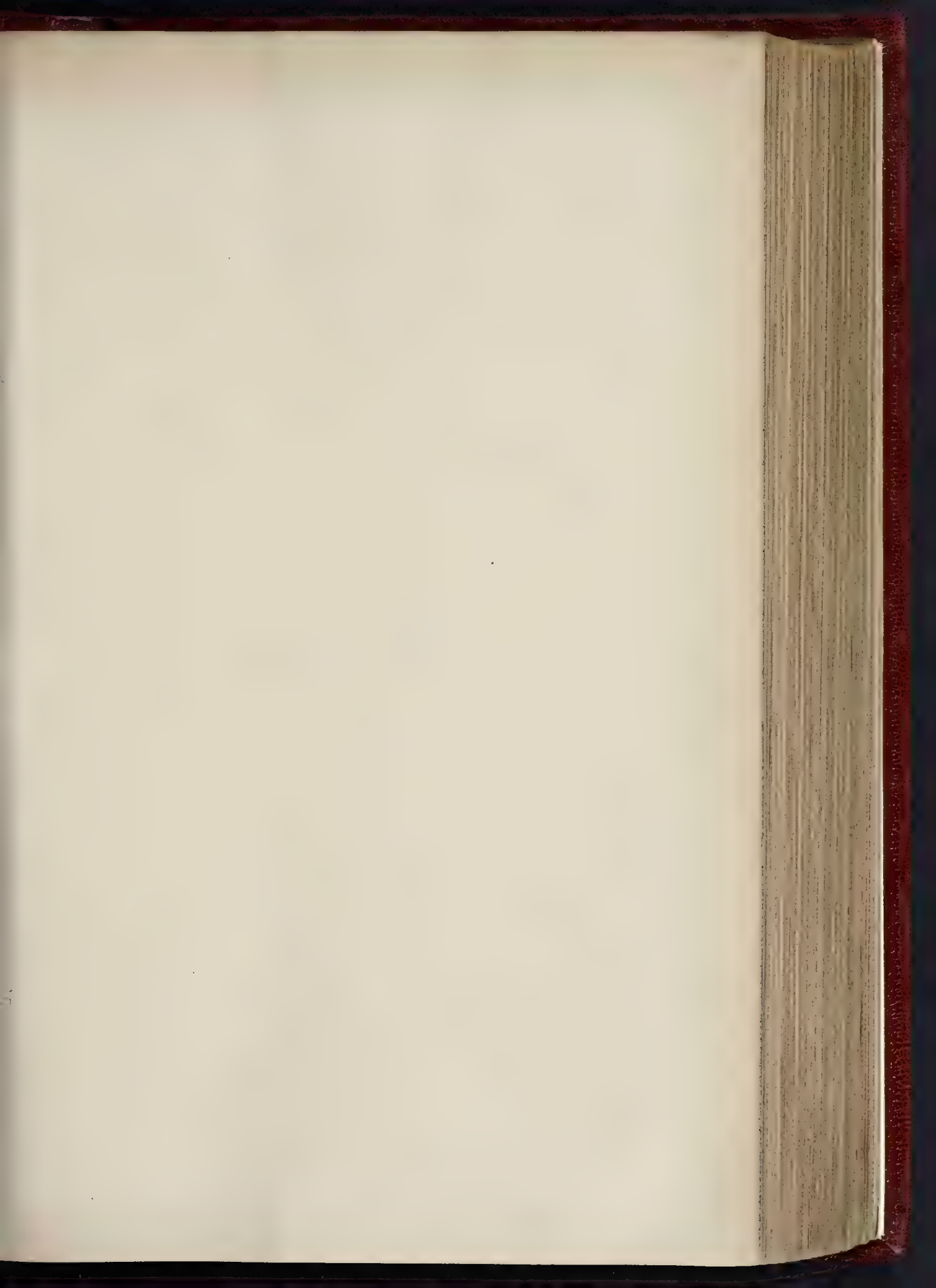


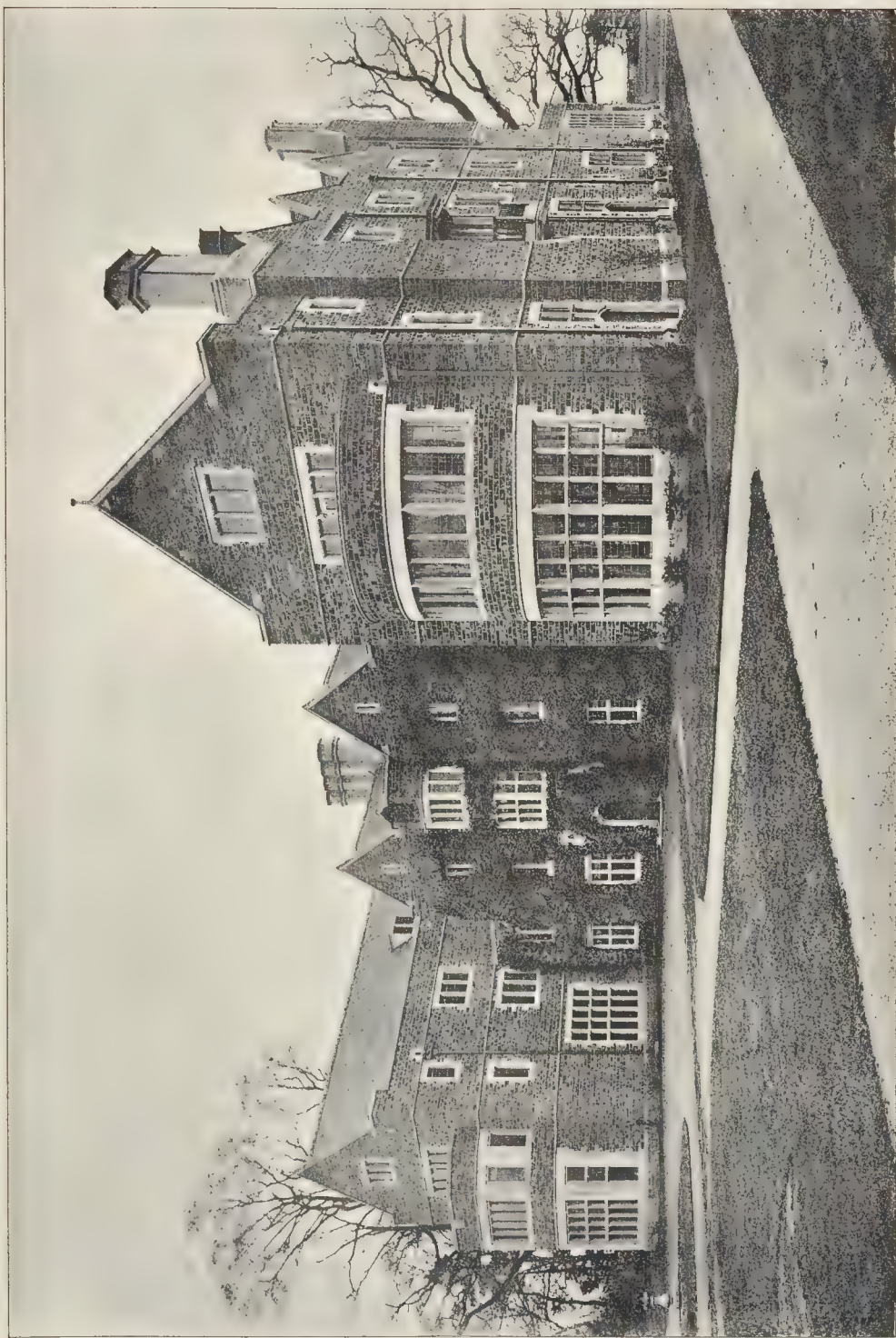
PHOTO LITHO SPRAGUE & CO. 45 EAST HARDING STREET PETER LANE 5 C



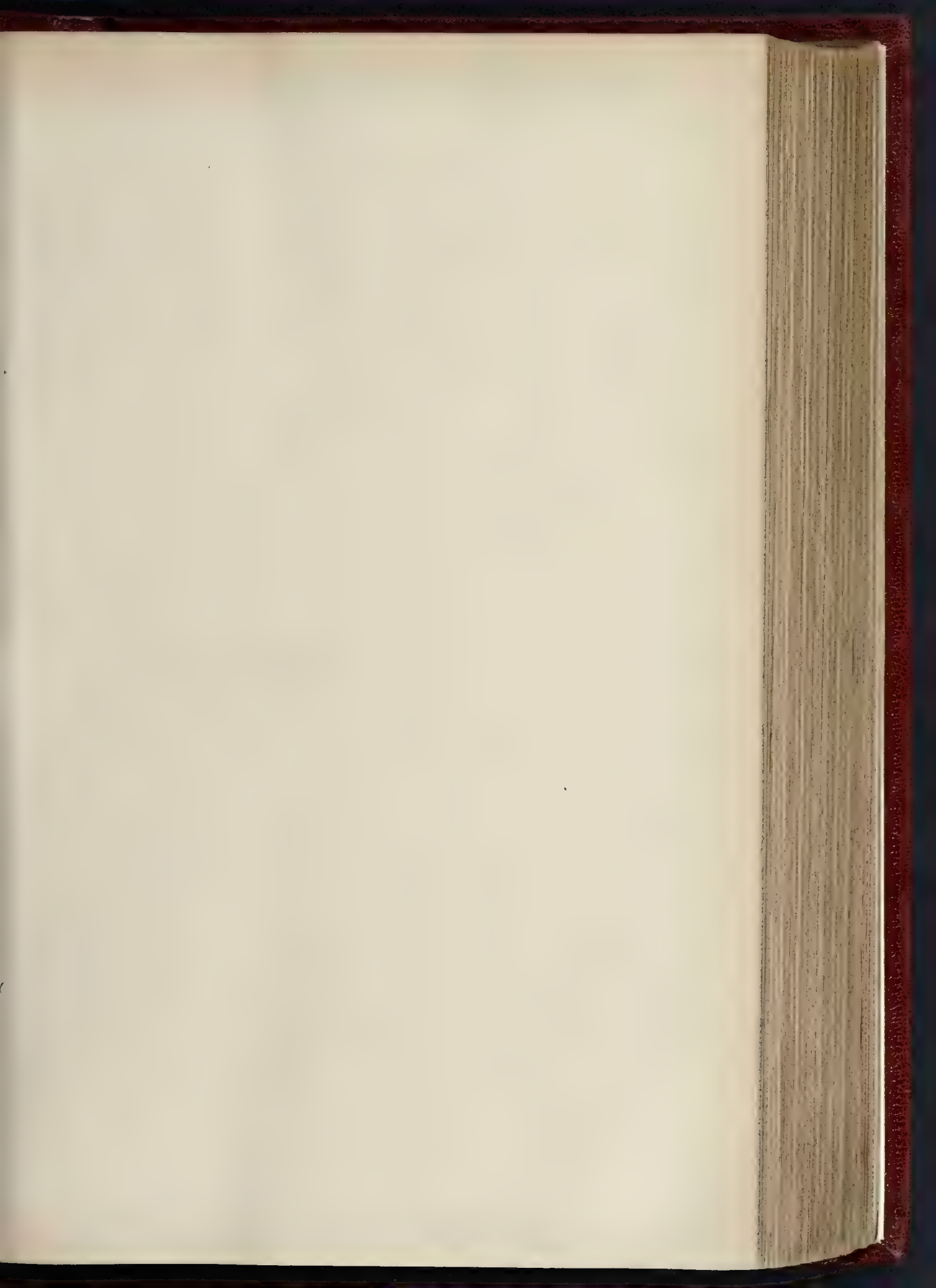




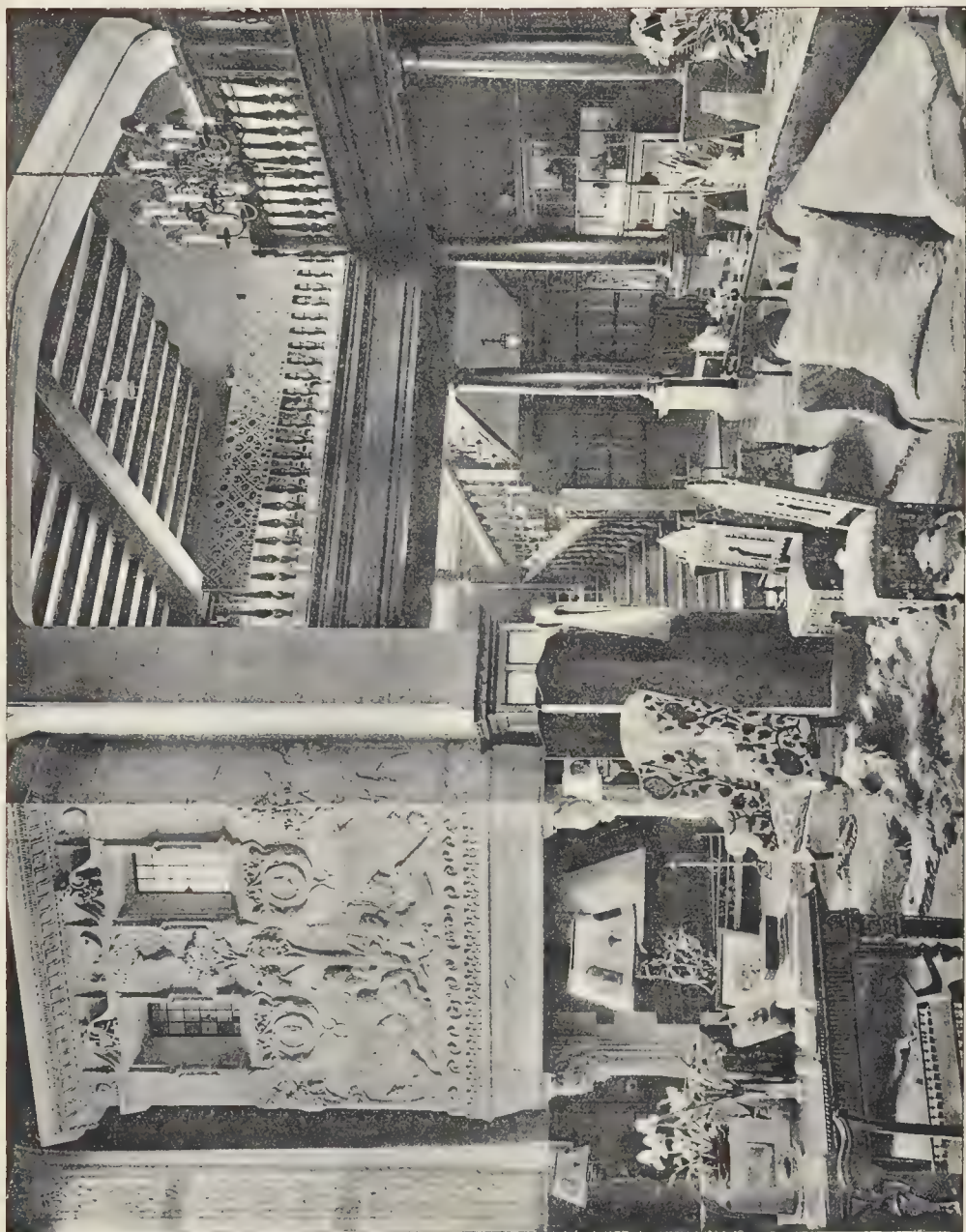
THE BUILDER, AUGUST 20, 1898.







THE BUILDER, AUGUST 20, 1898.







"ASHORNE HILL HOUSE," NEAR LEAMINGTON DINING-ROOM —MR E GOLDBE, ARCHT. (C)







NEW PHOTOGRAPHY, A.C. 11, 14 & 15 EAST WARD ST. JERSEY CITY, N. J.

"ASHORNE HILL HOUSE," NEAR LEAMINGTON DRAWING-ROOM. LOOKING INTO BAY—MR. E. GOLDBIE, ARCHITECT





Redcliffe, Bristol. It is vaulted—the only example of vaulting throughout the edifice—and has a chamber above. The stalls contain splendid examples of modern as well as medieval carving, and the usual quaint devices upon the subcellia are exceedingly interesting. The church was collegiate; the residence of the reader, bearing the date 1616, is still standing just without the precincts of the church, and portions of the collegiate buildings are traceable in a neighbouring structure termed Hosier's Almshouses. It need hardly be said that Ludlow contains a number of interesting examples of sixteenth and seventeenth century domestic architecture, which are deserving of attention. The "Feathers Hotel," an exceedingly fine specimen of a black and white timbered Elizabethan house, contains much good oak; the dining-room is a delightful and well preserved apartment. The "Bull Inn" is the present home of much of the oak that once decorated the business chamber of the Council of Marches; the panels bearing the shields of the several generations of presidents and members of the Council have been used to wainscot one of the rooms of the inn. The Ludlow Museum contains several objects of antiquity, amongst them a curious money-box of the Company of Stitches, which has been figured in the journal of the British Archaeological Association, Vol. xxiv, p. 332, and an instrument of torture intended to compress the head, which also has been described and illustrated (*Arch. Journal*, xiii, 269). The Grammar School, said to be the first school of that kind established in the kingdom, dates architecturally from the late fifteenth century. At Ludford House is what seems to be an authentic portrait of Richard III. Should this ascription be correct, the painting is of the highest historical interest, apart from its artistic value, which is considerable. In 1687 Sir Job Charlton, Speaker of the House of Commons, entertained James II. here in great state. Ludford Church has a brass to the memory of William Fox, who died in 1554. The town was walled and pierced by three gates, of which the only existing one, the Broad Gate, has lost most of its distinctive features by incorporation into modern dwellings. A chapel of St. Catherine once stood on the bridge that spans the Teme, but of it and of the adjacent priory of the Knights of St. John, who probably served the little bridge chapel, no traces now exist.

Tuesday's excursion led first to Stanton Lacy Church. The controversy that so long raged over the question whether there was such a thing as Anglo-Saxon architecture has subsided, the generally-accepted opinion being that there still remain a few edifices which possess certain peculiarities not found in any buildings of admitted post-Norman date. One of these is Stanton Lacy. The church is known to most ecclesiastical antiquaries; it has been described by the late Mr. Petit in the *Archæological Journal*, iii, 207. On the south side at the ground level of the external walls are four monumental arches of fourteenth-century work; one effigy seems to be in civilian dress though wearing a sword, the other is apparently that of a priest; both are indistinct. The remaining arches cover slabs, one showing a very early rude cross with the cross-head within a circle. The small cross over the closed Norman doorway in the north side of the nave is deserving of notice; it is equal-armed and probably occupies its original position above a doorway that has given place to the usual round-headed Norman portal. The eastern and western tower arches are ornamented with the ball-flower, but the corresponding north and south arches opening into the small transepts have plain chamfers and their capitals are without decoration. The church is dated 1609. The registers commence in 1561; they contain under 1643 a record of the construction of the still existing bridge over the neighbouring Corve. Culmington Church consists only of nave and chancel, divided by a poor Perpendicular screen. On the south side of the chancel is a double piscina, with a beautiful trefoil head. A Decorated niche has been made in the south wall of the nave, but the effigy is absent. The octagonal spire, which no doubt was of wood, has been destroyed, and clumsily replaced by a low zinc extinguisher. Diddlebury is an interesting parish church. There was probably a church here in Saxon times, which is borne testimony to by a rude piece of sculpture apparently representing Adam and Eve in the Garden of Eden, now built into the lower portion of a

closed window. The footings of the building consist of three shallow steps, and the wall rises directly from the upper step. This uncommon and primitive method carries the erection of the building back to a period anterior to the introduction of Norman. On the other hand, no long-and-short work is perceptible. About the commencement of the twelfth century a western tower was built. This soon showed signs of collapsing, and to strengthen it clumsy buttresses were placed at the angles, cutting through the Norman corbel table. The south wall of the interior contains some herring-bone masonry. The roof has been slightly altered in pitch. The north door, now closed but visible on the outside, is Norman, with a starred form of ornament. Corham Castle, which, with the manor of Corham, was granted in 1178 by Henry II. to Walter de Clifford, father of Fair Rosamond, is a name and naught else. Holgate, on the other hand, has antiquities of exceptional interest. Earliest in date is the mound, which may have been British, but which in external appearance more resembles those artificial earthen mounds that are termed Saxon. It is very perfect, and has suffered little from the operations of more peaceful times. The mound was at the angle of an enclosure, the line of which is perfectly clear, and which was itself within a larger enclosure. On the inner enclosure a Norman or Plantagenet built a castle, of what dimensions it is useless to speculate. But later still a prosaic Englishman entered into the labours of his predecessors, Briton, Saxon, and Norman, and built himself a farmhouse of quite insignificant appearance. With the practical utility and absence of sentimental considerations which are characteristic of the product of that racial amalgam, and finding his Norman predecessor's dwelling to be sound and strong, he incorporated a tower into his house, where it forms a striking testimony to the continuity of English life. The same Norman, or at any rate some other Norman, proceeded to build a church within a dozen yards of the stone castle and of the Saxon earth mound. There was no doubt a church already there, for the Norman's forerunners were just as devout as himself. The eastern gable contains a deeply-played late-Saxon window, of good proportions, slightly widening towards the foot, and having the splay so pronounced that the light has an external width of not more than 4 in. This building was probably almost entirely taken down; a tower was added, and entrance into the church obtained through a doorway of three orders in its western face. The tower has a plainly rounded string-course, below which its base is slightly battered. The font is the only other object of early date. It is a fine example of the fonts of the Norman period, and is in excellent condition. It rests upon a circular pillar, rising from a square cushion, which in its turn rests at right angles upon a square base; beautiful little carved figures occupy the angles. The upper edge is surrounded by a cable moulding. The body of the font is ornamented with zoomorphic designs formed by the intertwining of two dragons, some of the convolutions running into narrow strap work bearing a dot or stud pattern. The font and doorway are illustrated in Anderson's "Shropshire."

The next place of call was The Heath, a little church standing upon high ground, and far from the present haunts of men. Reference has frequently been made to the existence in the Shropshire churches already described of details of the architecture introduced into this country by the Norman barons. Whatever hesitation may still exist in accepting the claim of Saxon for some of them, there can be none in regarding all as having been worshipped in, if not built by, the earlier or later stocks of Norman baronage. Domesday Book was not intended to be a record of churches, but churches when they owned land came into the great register. Domesday was compiled in 1086. As bearing upon the question What was the character of the churches of Shropshire in 1086, whether built by Saxon or by Norman, the statement of Domesday in relation to one of the churches seen during the week is of prime importance. Of the church of Bromfield, under the heading, Quod tenet Ecclesia Sancte Marie [de Bromfeld], it is stated: "The same church holds Brunfelde, and there it is built. Here are now x hides, and in demesne vij ox teams, and there are xij neatherds, xv villiens, and xij boors with vij teams. It is worth 50s. annually to the canons,

and Nigel the physician has 10s. annually from this manor. In this manor there were in King Edward's time xx hides, and xij canons of the said church had the whole. One of them, Spirtes by name, had alone x hides, but when he was banished from England King Edward gave these x hides to Robert Fitz Wimarch, as to a canon, but Robert gave the same land to a certain son-in-law of his, which thing, when the other canons had shown to the king, forthwith the king ordered that the land should revert to the church, only delaying till at the court of the then approaching Christmas he should be able to order Robert to provide other land for his son-in-law; but the king himself died during those very festive days, and from that time till now the church hath lost the land. This land Robert now holds under Earl Roger, and it is waste. One part with another, the arable land is sufficient to employ liij ox teams." Here we have a church which T.R.E. (which, of course, does not make it, architecturally considered, a Saxon church) had twelve canons. Its very existence postulates the contemporary existence of other churches, and their continuance under the Conqueror. The comparatively peaceable reign of Henry I. saw the multiplication of churches, parochial as well as monastic; and there can be little doubt that by 1135, when Henry died, Shropshire was as well supplied with churches as it is now. The mischief is that, so anxious were the lords and abbots of later times to compound for sins they had a mind to by taking down the old churches and rebuilding them, that it is difficult to find a perfect example of the parish church in which our Norman ancestors worshipped. The church of the Heath happens to be one, and its neglect at the hands of antiquaries can only be accounted for by its present inaccessibility. The hurried visit of a party of archaeologists is not the occasion upon which justice can be done to such an architectural relic, but it is to be hoped that its introduction to the notice of antiquaries will lead to its careful study. Briefly, it consists of a nave and chancel divided by a plain, double-faced arch, which, on the chancel side, has a pier at the angles of each side resting upon a square base decorated in the regular Norman manner. The windows are original, with the exception of one Tudor insertion. The interior is structurally the same as when first built, save that the chancel has been ceiled with a flat roof which cuts the top of the eastern window, and the roof screen is to be partially traced amongst the timbering of the pews. The latter are all of oak, and have an ornamental Tudor rose within a lozenge carved upon each panel. The piscina is rude—no doubt the original—as is also the font, with its pattern of half circles running partially around it. The string course is carried below the sills of the windows, and is perfect, both externally and internally. The external walls have flat buttresses which are carried up to the corbel table; the doorway is of the usual character. It is clear that we have here a church which has retained its Norman features unaltered save in unimportant parts. Its preservation as such is a matter of moment. Though the mother church to Stoke St. Milburgh its remoteness led to the discontinuance of services within it except at distant intervals, but the present energetic vicar has re-established the weekly services, and this has drawn forth a perfectly natural call for greater comforts and conveniences than at present exist. The vicar is desirous to conserve the ancient features of the edifice, and at the same time to meet the requirements of the twentieth century. The problem is not a difficult one, but its thoroughly satisfactory solution depends upon the person called in to advise.

From the Heath church most of the party successfully accomplished the climb to the top of Abdon Burf, 1,792 ft. above sea level, where they found a prehistoric camp of the same character as Carn Goch in Carmarthenshire and the Flintshire Gaer. The earthen vallum is well defined throughout, and is protected by a ditch from 6 ft. to 10 ft. in depth. The entrance is guarded by parallel walling. A number of hut circles were discovered within the enclosure, and also traces of more recent excavations.

On Wednesday one section of the party proceeded to Ashford Carbonell. Amid much that is interesting in this well-restored church the most striking feature is the arrangement of the windows at the east end. These consist of two Norman lights of the round-headed, deeply-splayed type, with an oval-shaped or vesica window above. It is asserted that all the



lights are contemporaneous, and if this should be correct the juxtaposition of the round and the pointed arches makes this church one of the earliest examples of Norman Transitional. The true arrangement of the windows was not suspected until a restoration about fifteen years ago. Prior to that date the east end was lighted by a Perpendicular window, the insertion of which had been effected by the destruction of the Norman lights and of the lower half of the oval. The walls were plastered and white-washed, and the upper portion of the vesica showed as though it were the top of an ordinary lancet. The removal of the Perpendicular window revealed the internal angles of the Norman windows, of which sufficient had been preserved, as also of the upper part of the vesica, to admit of the restoration of the whole. The church has three bells, two of which are reported to be of early date. The Lombardic lettering upon one of the latter, dedicated to S. Paulus, is of superior elegance, the angles of the letters being floriated in an unusual manner.

Another party went to Richard's Castle, one of the strictly baronial fortresses thrown up by a Norman follower of Edward the Confessor for the purpose of protecting his estates from the Welsh. The castle is built on an earlier artificial mound, and the ruins consist of little more than the circular keep. The present remains, however, seem to be of later date than the Confessor. The church is close to the castle. It is an edifice of Decorated character, with fragments of Norman and Early English work. The tower is detached, a very unusual feature in this part of the country. The party reunited at Orleton. The church is an interesting example of transitional Norman. The two eastern lights are lancets under round-headed openings. The south windows of the nave are Decorated, with beautifully proportioned tracery. The Norman font is of very large size, and has the bowl divided into nine compartments, occupied by figures of the apostles. The figures are in strong relief, and the detail is unusually clear. The churchyard cross has the regular slender shaft, but is without the head. The chalice is pre-Reformation. Shobdon was formerly the seat of a priory whose church, if it was not parochial before, became so after the Dissolution. About a century ago the church underwent restoration. Three beautiful late Norman arches, one probably the chancel arch, and the others no doubt doorways, were removed by the lord of the neighbourhood to the summit of the hill above the church and erected something after the manner of a triumphal arch. The smaller arches are placed on each side of and slightly behind the larger or central arch, and the upper portion of the intervening spaces holds two pieces of sculpture which were once tympana. Mr. J. Romilly Allen, F.S.A., explained the subjects to be (1) Christ in Glory and (2) the Harrowing of Hell. The former subject occurs above a doorway in Ely Cathedral. Every portion of the arches is covered with sculpture, knights in armour, animal forms, and geometrical panels occurring in extraordinary profusion. The whole has an un-English character, which is attempted to be explained by the story that the founder of the church went upon a pilgrimage to Compostella and brought back a few foreign artists. There is a monograph upon these sculptures by Mr. G. R. Lewis. The Norman font has been set up in the churchyard; the bowl is decorated with figures of lions, executed with great spirit. Amyestry church has been well restored. It has a beautiful Perpendicular canopy which has come from some other edifice, traditionally said to have been at Neath or Swansea. One of the visitors observed that at the very period at which the screen was set up in Amyestry Church, the church known as Old St. John's, Swansea, was pulled down. The latter is known to have contained many extremely rich details which were not re-erected in the new edifice. During the restoration of Amyestry Church in 1886 several mural paintings were discovered, but, according to the vicar, neither from their religious or artistic character did they merit preservation. Wigmore parish church was for a short period conventual, but was early deserted for a site several miles distant where are the remains of Wigmore Abbey. The church is a large building, having had a large south aisle added in the Decorated period when the originally Norman church was altered. In the external north wall some good herring-bone work is to be seen. The piscina and sedilia

are interesting. Wigmore Castle occupies a low but, on one side, precipitous height, and commands an extensive plain. A burh is mentioned in the Saxon Chronicle as having been built here in the year 921. This was replaced by a Norman stronghold, which became the chief seat of the powerful family of Mortimer. It was rebuilt, and to some extent remodelled, by the Mortimer who suffered for his too intimate connexion with the widow of Edward II., but it continued to be private property until Edward IV., the heir of the Earls of March, merged it in the estates of the Crown. The castle was dismantled after the war of the seventeenth century, and much of it reduced to shapeless masses of masonry. Pipe Aston Church has a sculptured Norman tympanum. The subject is the Agnus Dei within an aureole, having on one side a winged bull and on the other a griffin. The whole is surrounded by a roll moulding; the capitals of the doorway bear carvings of two dragons with highly contorted tails.

The final day's excursion included Leintwardine, where is a large and much-restored church. The chancel is ascended from the nave by five steps, and it is stated, built upon part of the Roman wall, Leintwardine being almost certainly the site of the ancient Bravinnium. A beautiful late Decorated reredos has been ruthlessly cut away to allow of the insertion of a large east window. The last of the five bays of the nave arcade on the north side formed a small chapel of the Mortimer family. The stalls, which are of poor workmanship, are said to have come from Wigmore Abbey. The tower is of great height and of a different character to those of the neighbourhood. Bromfield Church consists of chancel, nave, and north aisle. As has already been shown, a church existed here in 1086, of which there are traces in a Norman loop in the wall between the nave and the north aisle, and in a large rounded arch behind the present altar which was probably the chancel arch of the Benedictine church. The chancel was enlarged and the nave aisle added in the thirteenth century. The church was restored in 1672, when the chancel ceiling was decorated with paintings in the extravagant style of the period. Brampton Bryan Castle was the seat of the Bramptons, whose heiress carried it to the family of Harley. It has been dwelt in by successive generations from the first Edward to Elizabeth, and bears abundant marks of having been adapted to the varying requirements of its occupants. The most perfect portion of the present ruins is the gateway, which dates from Edward III. Some of the details of this period are very fine, and a beautiful little Decorated window in the outer face of the gateway shows that by the middle of the fourteenth century the fear of sudden attacks by the Welsh or by a turbulent neighbour had subsided. The church is situated a few yards from the castle. It is a building of one chamber, having no structural division between chancel and nave, and is of great breadth. It is said to have been erected by Sir Robert Harley, one of the leaders of the Roundhead party. It has a grand hammer-beam roof, which is believed to have come from the ancient castle; but this is not probable, as it is difficult to conceive that the castle contained a room sufficiently large to have borne it. The upper portion is now concealed by modern matchboarding. A monumental effigy of the period of Edward III., said to represent the Brompton heiress who carried the castle to the Harleys, has been placed in a niche in the south wall. Bucknell Church has a fine Norman font. Coxwell Knoll, one of the sites which claim the honour of the last stand of Caractacus against the Romans, was also visited.

The last halt was made at Stokesay Castle, which has been so often described that it need only be mentioned here. The evening gatherings produced nothing of value except an interesting paper upon Bromfield Priory by the Rev. C. H. Drinkwater. The arrangements for the meeting were admirable, plenty of time being, as a rule, allotted to the really important objects of interest.

#### BOOKS RECEIVED.

HANDBOOK FOR GAS ENGINEERS AND MANAGERS. Sixth Edition. By T. Newbigging (Walter King, Bolt-court, Fleet-street, E.C.).  
APPLIED GEOLOGY. Part I. By J. V. Elsdon, B.Sc. (The Quarry Publishing Company, Limited, 5, Arundel-street, Strand.)

## Correspondence.

To the Editor of THE BUILDER.

### ST. MARTIN'S, CANTERBURY.

SIR,—Is there not a much simpler translation of the remains found at St. Martin's Church, Canterbury, than that suggested by the Reverend Canon Roulledge, which is mentioned in your review of his book given in the *Builder* of July 30? Having the plan of Stone-juxta-Faversham at hand induced me to draw out so much of it as was of early date by the scale given with the St. Martin's plan. Thereon a foundation is given in dotted lines east of the conjectural apse, an item which, unless actual evidence is present, may be fairly omitted, seeing that in so far as at least eight-tenths of all Saxon churches have square east ends. Comparison of the plan of Stone-juxta-Faversham with that of St. Martin's will show that the part west of such foundation should have read probably not "first extension" but "first work"; and to that east of such foundation first extension, in which it will be seen to closely follow what is found at Stone church ruins.



Stone-juxta-Faversham.



St. Martin's Church.

A. A. The early buildings in each case.  
B. B. Extension of choir eastward.  
C. C. C. Sites of shallow buttresses destroyed in pointed times to the walls of the church.

The walls extending west of St. Martin's chancel arch merely prove that an extension of the old choir took place westwards into the earlier nave, as well as to eastward of the former choir; consequently a new nave had to be formed (that nave at present shown on the plan you have given). No remains of its west wall having seemingly been recovered, therefore a west wall line is omitted. Nor can such be figured at Stone's early west-end either, for the wooden nave must there have continued until replaced by the flint walling of its latest nave, whose fragments still remain, this so late that the remains of its south door jambs still rest on a threshold slab formed of a reversed coped monumental stone. When we remember that Saxon churches usually descended one or two steps into choir from nave floor (as at Stone-juxta-Faversham and the Saxon Chapel, Bradford-on-Avon), the sectional line given on the plan in the *Builder* of no less than six steps above the nave floor shows how much, even in small churches, as at St. Martin's, are the old rules of Saxon age customs nowadays upset and overthrown.

JAS. T. IRVINE.

### REIGATE MUNICIPAL BUILDINGS COMPETITION.

SIR,—I enclose conditions of the competition for municipal buildings at Reigate—advertised in your last issue—and from a local knowledge of the place, as well as from a professional point of view, I sincerely hope that every self-respecting architect will give the Reigate Corporation a lesson and leave their competition to the contempt it deserves. There is hardly any chance of the scheme being carried out. The site is utterly unsuitable as to its position—at one end of the borough, and it is unpopular with by far the larger half of the ratepayers; in fact, the whole business is a fad. This is proved by the sixth condition:—"The Council do not guarantee to carry out any of the designs, and also reserve the right to modify, 'combine,' alter, or amend any of the prize designs which they may think fit, and in the event of any designs being carried out no further payment will be made to the author." You will thus see the Council very wisely do not guarantee to carry out any design!

The premiums—50*l.*, 30*l.*, and 20*l.*—amount to 100*l.*, for which noble sum the Council hope to buy up three designs, and "their authors shall have no further claim upon them." Then they are going to "combine," alter, &c., the lot! "Combine" is beautiful! Imagine the result—the Reigate Town Council's patent combination design! The "assessors" are mentioned in Conditions 2 to 5, but nowhere is it stated who they will be; but in Condition



6 they give place to the "Council." Are they one and the same persons? Observe the drawings required: "A general elevation," a general section! and three plans! Who will make the other necessary drawings, when the Council have purchased the three most suitable designs? What is a "general" elevation? Is it possible that, having picked the brains of three poor architects, the drawings are to be turned over to the Borough Surveyor to carry out?

Seriously, I sincerely hope that the poor old profession has not fallen so low as to produce three respectable practising architects to respond to these miserable conditions.

ARCHITECT.  
Our correspondent might also have quoted clause 4 of the conditions, which reads:—"The assessors do not bind themselves in the event of only a small number competing to give the three premiums before mentioned, but only such as they may consider merited!"—ED.

SIR.—With this I enclose conditions of competition for the proposed Municipal Buildings, Reigate. The terms offered are so preposterous that it is difficult to conceive that any architect would be willing to compete; yet some plans will, I expect, be sent in.

The Corporation of Reigate offer 100l., divided into three premiums of 50l., 30l., and 20l. This might be a suitable sum for many things, but the Corporation require plans to the one-eighth scale for buildings to cost 15,000l., for which, without competition, they would have to pay an architect 2½ per cent., or 375l.; but for 100l. the Corporation hope to obtain three designs which shall become their absolute property, no further payment to be made to the authors in the event of any design being carried out.

This generous offer is further enhanced by the statement that they do not bind themselves to give three premiums should only a small number compete, but only such as they consider merited.

GEO. HURST STANGER.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—VIII.

SOUND VIBRATIONS.

IN the last article we described an apparatus for determining the velocity of sound in divers substances; and in connexion therewith referred to nodes and vibrations. Let us consider the subject more in detail. If we know the number of vibrations in a sounding body, or which that body makes per second, it is an easy matter to calculate the corresponding wave-length. Assuming in the calculation that sound travels at about 1,120 ft. per second, if a body only made one vibration per second its wave-length would be 1,120 ft.; if it made three, the third, and so on. From this we perceive that the wave-length of any note is the quotient obtained by dividing the velocity of sound by the number of vibrations.

We cannot go into the properties of musical notes at any length; but in so far as the physical theory of music leads us to comprehend the meaning of vibrations and their effects upon each other, it may be discussed. The student will find this matter dealt with in some detail by Atkinson in "Gano's Physics," chapter iii. A simple musical note results from continuous rapid isochronous vibrations, provided the number of the vibrations falls within the following very wide limits. It was thought at one time that the human ear could not perceive a sound when the number of vibrations was below sixteen per second for deep sounds, or above 9,000 for acute sounds. Savart showed, however, that the faculty of perceiving sounds depends more on their intensity than on their height, so that when extremely acute sounds are not heard it arises from the fact that they have not been produced with sufficient intensity to affect the organ of hearing. By increasing the amplitude and intensity of the vibration he produced acute sounds up to 24,000 vibrations per second. Conversely, he made very deep sounds of only 7 or 8 vibrations per second. Despretz succeeded in getting acute sounds audible up to 38,000 vibrations per second, and subsequent observers up to 41,000. To very many people, however, the maxima mentioned would be inaudible, and in any case affected the ear as though the latter had been pricked by a number of sharp points. A graphic method has been devised for determining the exact number of vibrations corresponding to a given note.

Pursuing the subject of musical sounds, which must of necessity fall well within the maximum and minimum limits just defined, it may be stated that musical notes are in most cases of a compound character. Atkinson

remarks that the tone given out by a tuning fork furnished with a proper resonance-box is simple; that yielded by a wide-stopped organ pipe, or by a flute is nearly simple; whilst that coming from a musical string is compound. The "pitch" of a musical note is determined by the number of vibrations per second yielded by the body producing the note; the "intensity" of the note depends on the extent of the vibrations, being, in fact, proportional to the square of the extent, or amplitude of the vibrations; the "quality" is that peculiar property of a note, not at all well understood, which distinguishes a note when sounded on one instrument from the same note when sounded on another. This quality is sometimes known by the term "timbre."

From what has previously been said it will be obvious that if we know the number and extent of vibrations for any particular musical note, we can ascertain through what substances it will travel best, or what will impede it when necessary. When we come to consider the question of reflection of sound and echoes, it will be seen that there is a practical advantage in studying amplitude also, in connexion with the acoustic properties of interiors. A musical note of a definite pitch is produced by a definite number of vibrations, and there is, consequently, a definite relationship existing between musical notes, and this forms a basis for the physical theory of music. Standards have been created by the use of tuning forks, yielding so many vibrations per second. A perfectly accurate standard is, however, a most difficult thing to obtain, for heat acts on the tuning fork by expanding it, and also by diminishing the elasticity of the metal, both effects agreeing in lowering the pitch. With a tuning fork giving out 512 vibrations per second at 20 deg. Cent., the variation is about 0.056 vibration per second for every Centigrade degree either way.

Bodies in a state of vibration can succeed in setting up vibration in bodies at rest under certain circumstances. Thus, if two forks, tuned to give the same note, be set up some few feet or yards away from each other, and one of them be sounded, the other will immediately vibrate in the same way, and emit the same note, even though it were not touched by the sounder. That is distinctly a mechanical result, paralleled in many other branches in physics. It is known as "consonance."

If a tuning-fork suspended in air be sounded, it gives forth but a very feeble note; if the stem of the same fork be held down on a table the sound is far louder and more pronounced. The sound may be reinforced by attaching the sounding-body to a dry, elastic slab of wood, which being vibrated by the sounding-body, communicates the motion to air over a broader field or larger area than the sounding-body itself could. The sound may be considerably reinforced also by the body emitting it being attached to a wooden box. This phenomenon is called "resonance."

Consonance and resonance are closely related to each other, but in round terms they may be distinguished in that, for consonance to be brought into play, it is necessary that two bodies shall vibrate in unison and the sound emitted from that one deriving the sound continues after that given from the exciting body; whilst with resonance the sound of the resonant body is merely reinforced and is practically simultaneous with that of the resonant body. Moreover, with resonance there is no bias in favour of any particular note, except in a very general way, for the sounding board strengthens the sound of a number of widely different and, it may be, complex notes. We have said that the sounding-board must be a dry, elastic slab of wood; obviously, the more readily the vibrations of the sonorous body are taken up the better, so we come to consider the elasticity of different kinds of wood.

Of course, all wood is elastic; the questions are, is it homogeneously elastic? and how far is each principal kind elastic? We are not now so much concerned with sounding-boards for musical instruments as those for large halls and the like. In his experiments on timber Bauschinger ascertained that the elastic limit in tension almost coincides with the breaking point. The coefficient of elasticity was determined from the extension with a load of about one-third the breaking load. The coefficient of elasticity varies with the strength, increasing and decreasing with it. The bending tests on beams of the full useful section of the log showed generally that the strength and coefficient of elasticity varied directly with the density. The same observer found that the

amount of moisture in the timber had a very great influence on its density and strength, so that comparative values could only be obtained by reducing experimental results to an uniform standard dryness, which he did in all future tests.

It was found that pieces cut near the heart of the tree are much weaker than those cut near the periphery; and this is connected generally, but not always, with less density in the wood near the heart. It follows, therefore, that as wood is not by any means homogeneous in structure, and that as the heart neither possesses the strength nor the coefficient of elasticity of those portions of the timber outside, we must, in the construction of a sounding-board, either not use the heart at all, or place it in such a position as that it shall not materially interfere with the sound vibrations induced within the board. This latter is a most difficult problem, for if only one board is to be used it must be a small one unless the heart is to be brought into requisition; the employment of a number of pieces of wood, however ingeniously constructed, cannot be as perfect a resonant substance as one piece. It may be suggested that other materials than wood may be used for the purpose, and so they often can—that largely depends on the class of sounding-board required; the student will see that such a question can only be satisfactorily solved when a true perception of the timbre of the sounding-body is grasped, and that must be taken in conjunction with the acoustic properties of the hall or theatre as a whole. In other words, where an interior has been suitably constructed, and the sound from the stage or platform has only to be slightly fortified (to minimise the effect of echoes, &c.) the sounding-board would not be seriously impaired on being properly made of several pieces of wood.

Returning to the subject of the elasticity of different kinds of wood, the following figures\* may be useful:—

TIMBER.	Coefficient of elasticity for 1 in. sq. in. per sq. in.	Tensile strength along Fibre, tons per sq. in.	Crushing strength along Fibre, tons per sq. in.	Coefficient of bending stiffness per sq. in.
Spruce .....	714	5.54	4.91	4.91
Red Pine .....	750	5.83	5.71	5.71
British Oak ..	656	5.70	4.46	5.27
Indian Teak ..	1,071	6.70	5.30	6.92
Ironbark .....	871	7.12	5.34	7.15
Blue Gum .....	910	8.97	5.15	5.80
Jarrah .....	317	1.31	3.0	4.13

These figures are, doubtless, somewhat in excess of the actual coefficients and strength, as the experiments were made on small pieces of wood without flaws, which were specially selected.

Elasticity of wood, as shown by bending, has often been tested, especially by German observers. These indicate a range for red pine of 654-686 as coefficients of elasticity, 1.28-1.40 as elastic limits in tons per square inch; whilst for spruce we have 438-737 and 0.84-1.66 in tons per square inch respectively. The spruce must, all of it, have been of very bad quality, which clearly shows that where this material is used for lining purposes it must be carefully selected to bring out its acoustic properties to advantage.

American experiments show that yellow pine has coefficients of elasticity varying from 728-1,091 tons per square inch: white oak, 493-781; and old, seasoned white oak from 646-955 tons per square inch.

In selecting wood for sounding-boards the following points should be carefully attended to. Inasmuch as the object is to throw the sound out into the hall, and away from the board, the fibres ought not to be at right angles to the face of the board but parallel with it; in fact, what was said towards the end of the last article respecting the lining of partition walls largely applies here also. The more a body diverges from the form of a plate and approaches that of a rod the more is its resonance limited; it tends to strengthen a few notes only. We cannot get wood without fibre, and the fibres tend to act as rods, or conductors; therefore, *ceteris paribus*, we should search for a wood with as few pronounced fibres as possible. Then, again, seeing that density materially influences elasticity (which is the life and soul of the sounding-board), to get the most satis-

\* Unwin: "The Testing of Materials of Construction," 1888, p. 397.



factory results the wood selected should not only be free from knots, but from the circular and semi-circular graining which ushers in the appearance of a knot.

We cannot enter now into details concerning the micro-structure of wood, but in general terms the microscope may be usefully employed in ascertaining the relative size of the cells forming the main fibres. Practically, all the cells will be found to be elongated, but for the purpose at present on hand, the wood having the least elongated cells in the chief fibres will be found to be best. The sole object is to get the board to vibrate readily, and, as far as possible, all its parts should vibrate in unison; any kinks, knots, or other irregularity of grain (in fact, any want of homogeneity) tend to set up minor vibrations counter to the chief set of vibrations which impair the value of the wood from the point of view of inductive vibrations.

The phenomenon of the "interference of sound" is peculiar in its effects, but may be readily understood. Atkinson remarks that if two waves of sound of the same length proceed in the same direction, and if they coincide in their phases, they strengthen one another; if, however, their phases differ by half a wave length, they neutralise each other and silence is the result. If the notes are different and are not quite in the same phase, they alternately weaken and strengthen each other and are said to "beat" with one another. The beating of sounds affects the sense of hearing in a somewhat similar manner to the eye affected by a flickering light—there is an absence of steadiness. The phenomenon, however, has its uses for the musician—chiefly for tuning purposes.

#### OBITUARY.

MR. J. T. MEREDITH.—The death occurred suddenly, on the 10th inst., of Mr. J. T. Meredith, architect, of Kidderminster. Mr. Meredith was sixty-three years of age.

MR. G. DE NYST CLARK.—On the 10th inst., at Mundesley, Norfolk, the death took place of Mr. G. de Nyst Clark, a partner in the firm of Messrs. Patman & Fotheringham. The business of the firm will be carried on as before.

MR. JAMES F. SINNOTT.—On Monday morning Mr. James F. Sinnott, architect, Liverpool (Messrs. Sinnott, Sinnott, & Powell), was drowned at Eastbourne. The deceased leaves a widow and two children.

#### GENERAL BUILDING NEWS.

ST. CUTHBERT'S CHURCH, MIDDLESBROUGH.—The plans for this church, the foundation-stone of which has just been laid, were prepared by Mr. Temple Moore, of London. The church has been designed with a view to its position at the junction of Newport-road and Ayresome Grange-road. The plan consists of a wide nave and chancel, five bays in length, with narrow aisles and passages on the north and south sides, and round the east end behind the altar. There is also a western aisle of considerable width, into which the doorways of the north and south-western porches open. The Lady Chapel and vestries are placed to the eastward of the eastern aisle or ambulatory, and are designed so as to fit into the triangular piece of ground formed by the junction of the two roads. The organ chamber is placed over the large south-eastern porch. There is no structural division between the nave and chancel, the latter being enclosed by a low screen or wall. The east window, which rises above the arches of the eastern ambulatory, consists of seven lights. There is also a circular west window over the western aisle of the nave. Externally, the church is faced with stone, and the roofs will be covered with stone, slate, and red tiles. The contractors for the work are Messrs. Allison Bros., of Middlesbrough.

PROPOSED RESTORATION OF RUNWELL PARISH CHURCH, ESSEX.—It is proposed to restore this building, under the supervision of Mr. W. F. Unsworth, architect. The work proposed to be done comprises the enlargement of the chancel, the building of a vestry, the opening of the roof (now plastered), the restoration of the rood screen and south porch, &c.

PROPOSED RESTORATION OF ST. GEORGE'S CHURCH, LEEDS.—An appeal has been issued for funds for the restoration of St. George's Church. It is stated that the roof of the church is in bad condition, and it is absolutely necessary that serious structural repairs be undertaken at an early date. Mr. Henry Walker, architect, Leeds, has examined the building, and made a report in regard to it. The restoration scheme comprises: (1) the thorough cleaning, painting, and decoration of the interior of the church; (2) a new roof; (3) new pews for the body of the church; (4) electric lighting; (5) the construction of an apse at the east end (in which the painting by Cope will retain its place over the holy table); (6) more commodious

vestry accommodation; and (7) the rearrangement of the heating apparatus. To carry out the whole scheme, for which the requisite facility has been obtained, will involve an estimated outlay of 5,000l. CATHOLIC CHURCH, HOWTH, CO. DUBLIN.—A Catholic church is being erected at Howth, the architect being Mr. W. H. Byrne.

CHURCH, ACHADOWN, CO. DERRY.—The memorial stone has just been laid of the new Church, St. Mary's, Achadown, in Coleraine parish, county Derry. Mr. O'Shea, Belfast, is the architect, and Mr. J. M. Nally, Cookstown, the contractor of the building, which is constructed of local black stone, relieved with selected Dungannon cut stone dressings.

NEW CHURCH, TRIM, CO. MEATH.—The Church of St. Patrick, at Trim, is now complete except the interior work. The walls and roof were built at a cost of 12,000l. The remainder of the work is estimated to cost about 5,000l. Mr. William Hague, of Dublin, is the architect, and the contract was given to Mr. Patrick Nolan, of Monaghan.

WORSTED CHURCH, NORFOLK.—It is proposed to restore this building, and Sir Arthur Blomfield, who has prepared plans for the restoration, reports that the work immediately necessary or desirable in the future may be divided into two main sections: first, structural works needed to put the whole building into a thorough state of repair, and as far as possible to arrest the progress of decay; secondly, to carry out works which will have for their object the permanent improvement of the interior of the building. In the first section the first thing to be done is to put the roof throughout into a thorough state of repair. It will require a sum of not less than 3,000l., says Sir Arthur Blomfield, to restore to the church some faint reflection of its former glories.

ST. MARGARET'S CHURCH, FINGLAS, DUBLIN.—The foundation-stone has just been laid at St. Margaret's, Finglas, of a new church. The architect of the church is Mr. G. L. O'Connor. The nave is to be 80 ft. long by 32 ft. wide, with chancel, sacristies, &c., and is capable of accommodating 400 persons. A porch will form the principal entrance at the west side of the church, facing the roadway.

RESTORATION OF ST. MARY'S CHURCH, COVES, Isle of Wight, has just been completed. The work was carried out under the superintendence of Mr. Herbert R. Lloyd, architect, of Birmingham.

EPISCOPAL MISSION CHURCH, DUNDEE.—A new church is to be erected for St. Paul's Episcopal Church, Dundee. The church is on the level of Blackcroft, in which is the main entrance. Seated for about 300, it will have a small chancel at the south end, with organ chamber and vestry. At the north end the plans show a recessed baptistry and two mission rooms, with caretaker's house above. Below the church, and entering from Foundry-lane, there will be a hall with the same accommodation as the church, and provided with retiring and cloak rooms. The building is to be carried out in a combination of red brick and stone, with green slates. The architect is Mr. T. M. Cappon, Dundee.

WESLEYAN CHURCH, OVERSTRAND, CROMER.—Several memorial bricks of a new Wesleyan church have just been laid at Overstrand. Building operations are in the hands of Mr. G. Riches, jun., of Cromer, and Mr. Edwin L. Lutyens is the architect. The chapel will be of red brick.

WESLEYAN SUNDAY SCHOOL, EMBAY, YORKSHIRE.—The memorial stones have just been laid at Embay of a new Wesleyan Sunday school. The following are the contractors: builder, Mr. S. Witham, Crosshills; joiner, Mr. T. Thornton, Skipton; slater, Mr. T. Throup, Cononley; plumber, Mr. G. H. Mason, Skipton; plasterer, Mr. T. Bailey, Skipton. The architect is Mr. J. Hartley, of Skipton.

WESLEYAN CHURCH, SCUNTHORPE.—On the 10th inst. the foundation-stones of a new Wesleyan church were laid at Scunthorpe. The cost of the land and building is 6,293l., and the contract for the work is let to Messrs. Kelsey & Son, of Goole, for 4,103l., the architect being Mr. J. M. Dosser, of Hull.

FREE CHURCH HALL, LAURENCEKIRK, KINCARDINESHIRE.—A new free church hall is to be erected at Laurencekirk. Mr. D. Wishart Galloway, of Brechin, is the architect. The hall will be 36 ft. by 22 ft. 6 in. The contractors for the work are as follows:—Mason, Mr. David A. Crabb, Brechin; joiner, Mr. Dunbar, Laurencekirk; plumber, Mr. Rae, Laurencekirk; plasterer, Mr. Hood, Laurencekirk; and slaters, Messrs. James Scott & Sons, Brechin and Montrose.

SCHOOLS, MIDDLESBROUGH.—New Board schools are being erected at Middlesbrough at the corner of Marton and Borough roads. The frontage to Marton-road is about 130 ft., that to Borough-road about 65 ft., and that to the street running parallel to Marton-road, 275 ft. The architect of the building is Mr. J. Mitchell Bottomley, of Middlesbrough. The site has been divided into two sections, and the more southern part has been reserved for the erection of a separate infant school. The building now being erected on the northern and larger part of the site is for a school for about 1,000 children, in a part of which the infants will be accommodated for the present. The new school is built of brick, with dressings of red stone. It is two stories in height, and is on the central hall principle. The classrooms are arranged along the sides of the halls, and

are lighted from the north and south; the entrances, of which there are four, are placed at the ends of the building, the ground floor being entered immediately from the playgrounds, and the first floor by wide stone staircases. Lavatories and cloak-rooms are provided closely adjoining the entrances. The whole of the class-rooms are lighted from the left side, and are fitted with dual desks. The class-rooms are divided from the central halls by piers and arched openings, which are fitted with glazed partitions. Glazed bricks are used round the walls to a height of 4 ft. above the floors, and above this height the walls are covered with non-absorbent plaster. The warming is by low-pressure hot-water system, and has been executed by Messrs. Dinning & Cooke, of Newcastle-on-Tyne. The ventilation is provided for by extract flues carrying the foul air into the ventilators fixed in the turrets on the roofs. Open fireplaces are provided in each class-room. Rooms are provided for the head and the assistant teachers in the mezzanine floors. The playgrounds have been covered with asphalt by Mr. Mullen, of Middlesbrough. Covered play-sheds are provided along the east boundary, together with latrines. The contract for the whole of the work, amounting to 17,173l., was secured by Messrs. Allison Bros., of Middlesbrough; the plumbing work has been done by Messrs. Baker Bros., the plastering by the late Mr. Tomlinson, the slating by Mr. Tyreman, and the painting by Messrs. Taylor & Sons. Mr. John Johnson, of Middlesbrough, has acted as clerk of the works.

ST. POLYCARP'S SCHOOL, EVERTON.—Alterations to these schools have just been carried out, and the buildings have been reopened. The boys' school-room has been divided into class-rooms, and Wilk's "climax" sliding partitions have been provided, so as to make the school-room available for meetings. In addition to this, a flat roof, or ceiling, has been put in, together with new ventilating apparatus. A new system of heating has also been fitted throughout the whole schools. The ventilating and heating arrangements were carried out by Messrs. Dargue, Griffiths, & Co., Limited, of Liverpool. The whole of the work was carried out under the supervision of Mr. T. Taliesin Rees, architect, of Birkenhead.

BOARD SCHOOLS, WEST STANLEY.—The new Board schools which have been built by the Tansfield School Board in Front-street, West Stanley, have just been opened. There is a total accommodation for 777 scholars. The plans were prepared by Messrs. Davidson & Bendle, Newcastle; and the contracts were carried out by: Mr. A. Routledge, West Stanley, mason work; Mr. T. Robinson, Burnopfield, joiner work; Messrs. Wilkinson & Co., Newcastle, the concrete work; and Messrs. Dinning & Cooke, Newcastle, the hot-water apparatus. The total cost is about 3,000l.

ALTERATIONS TO RESTAURANT BUILDINGS, ABERDEEN.—For some time alterations have been in progress on the buildings at the corner of Union-street and Back Wynd, Aberdeen, occupied for many years as the Queen's Restaurant, &c. The alterations involve the reconstruction practically of the whole interior, as well as some considerable changes to the exterior of the buildings. Henceforth the three floors, besides the basement, are to be devoted to the purposes of a first-class restaurant and catering establishment. The architect for the alterations is Mr. A. Marshall Mackenzie, A.R.S.A.

NEW CHURCH, WREXHAM.—New open choir stalls have just been dedicated at St. Mark's Church, Wrexham. They have been erected by Messrs. Harry Hems & Sons, of Exeter, the architect being Mr. J. H. Swainson, of Wrexham.

PUBLIC BATHS, LOUGHBOROUGH.—The public baths, which have been erected in Island House Park, Loughborough, as a memorial of the Queen's Diamond Jubilee, have just been opened. The building has been faced externally with local red pressed bricks, supplied by Messrs. G. Tucker & Son, with terra-cotta dressings from Ruabon, North Wales. The structure is covered with small grey slates. The principal entrance to the baths is from the centre of the front elevation, through a vestibule having a panelled ceiling, and divided from the inner hall by a glazed screen. From this entrance-hall, which is paved with Hopton Wood stone, access is obtained to the large swimming bath, and to the corridors leading to the private slipper baths, the office being arranged on the left-hand side at the entrance. There are nine private slipper baths—four first-class being to the left of the hall, and five second-class to the right. These private baths are divided by pitch-pine partitions, each having a separate window and ventilating Tobin tube. At the end of the first class are the laundries. There are three ironing rooms arranged, whilst at the end of the second-class baths is an emergency exit, together with a staircase leading to the gallery for spectators in the large bath. The swimming bath has a water area of 80 ft. by 30 ft., with a depth varying from 6 ft. to 3½ ft. It is surrounded by a cement concrete bath, having a coloured concrete kerb. There are thirty pitch-pine dressing-boxes on one side and end. The dimensions of this hall are 94 ft. by 42 ft. The roof is an open pitch pine one, supported by light iron principals, and surmounted by a lantern light the full length of the building. There are windows on each side. The bath is lined throughout with white glazed bricks, having at intervals lines of blue glazed bricks. A diving stage has been erected at



the deep end, and at the opposite end over the dressing boxes is a pitch pine gallery capable of holding about 150 people. At the east end of the swimming bath are soap and spray baths, boys' dressing-room and lavatory. The two latter are lined with glazed bricks, and have floors of concrete. At the rear of these auxiliary departments is the boiler house, with an octagonal chimney stack 60 ft. high, and a stove yard. The several contracts for the baths were entrusted to Messrs. T. Barker & Son, the contract for the heating was placed with Messrs. Messenger & Co., Limited; and the baths have been designed and carried out under the personal supervision of the architects, Messrs. Barrowcliff and Allcock.

**HOTEL, MULLION, CORNWALL.**—A new hotel has just been opened at Mullion Cove, Cornwall. It has been erected from plans prepared by Mr. Sampson Hill, architect, Redruth. It has three sea frontages. The hotel is lighted by electricity, which has been laid on by Messrs. Veale & Co., Limited, St. Austell. At the rear of the main building there is a large picnic room 42 ft. by 16 ft., with coal stores, &c., below, and extra bedrooms above. The building has been erected by Messrs. Winn & Son, of Helston.

**NEW THEATRE, MARGATE.**—This theatre—the Grand—is situated in Cecil-square and Cecil-street. The building, which has undergone many external and internal alterations, was, till recently, the Royal Assembly Rooms. Sitting accommodation has been provided for 1,800 persons. The decorations are in bold and light blue, and the mosaic ceiling is similarly ornamented. Front seats are an uninterrupted view of the stage, which is 60 ft. wide by 40 ft. deep can be obtained. The decoration and seating are by Mr. Dean (Birmingham). Mr. Hope was the architect, and Mr. Davidson the contractor.

**PAVILION HOTEL, FOLKESTONE.**—The Royal Pavilion Hotel, Folkestone, has been considerably extended, and on the 6th inst. the addition was opened. Accommodation is now provided for 200 guests, and when the remaining wing is rebuilt there will be room for thirty more visitors. The furnishing and decoration have been carried out by Messrs. Maple & Co., of Tottenham Court-road. Colonel R. W. Edis, F.S.A., is the architect.

**CARDIFF CUSTOM HOUSE.**—The new Custom House, Cardiff, which is in course of erection in Bute-street, near the Pier Head, will be completed about the end of next month. The building is being erected at a cost of about 4,800, by Messrs. W. Thomas & Co., of Cardiff, from the design of Mr. Tanner, architect to H.M. Office of Works, London. It is three stories high, the front which faces Bute-street being in Portland stone, while the side and rear are in white brick, partly relieved with Portland stone dressings. The entrance is from Bute-street, by means of a fore-court at the side nearest the pier head. On the ground floor in front is situated the office of the Chief Preventive Officer and Surveyor, having immediately behind it the boot-room. At the rear of the premises on the same floor, and reached by a corridor leading from the entrance hall, are the Queen's warehouse and watchers boatmen-room, while a yard at the rear of the premises opens on to the West Dock. The first floor is devoted, in front, to the testing room, which overlooks the street, and to the store-room immediately behind, and at the rear to the collector's office and long-room. The top story has been set apart for the caretaker and domestic offices, while in the basement are the heating-chamber, wood and coal stores, &c. The offices on the ground and first floors are laid with wood block flooring, and on the ground floor the entrance hall and corridors are laid with York paving. The clerk of the works is Mr. M. Pickett.

**BUILDING IN RAVENSTONDALE, WESTMORELAND.**—A house, with stable, has been built in this village for Mr. Carter, who is now building model cottages. A new hotel, which will follow immediately, will be built of stone, on the lines of the old "Manor houses" in the neighbourhood. A stone staircase leading from the roadway to a public room for sales, &c., will be made a feature, having an oak gallery over. Homesteads and farm buildings for the estate have also to be built. The work is in the hands of the architect, Mr. Robert Walker, of Windermere.

**VILLAGE HALL, HALKYN, FLINTSHIRE.**—This building has just been opened by the Duchess of Westminster. The hall, a building of local stone, is from a design by Messrs. Douglas & Minshull, architects, Chester, the contractor being Mr. A. B. Lloyd, builder, Flint. The cost of the building was about 950.

**DOWN DISTRICT ASYLUM.**—The building of the new wing to this asylum is, says the *Belfast News-Letter*, rapidly approaching completion. The building, which is similar in general appearance to the present west wing, is built of red brick, obtained from the Lagan Vale estate. The new works comprise a dining hall, with a wagon roof of pitch pine; dormitories, padded rooms, water and engine-house, foul laundry, with patent hydro-extractor. All the floors of the sanitary annexe are of concrete, supported by iron beams. The large dormitories measure 60 ft. by 24 ft. The architect is Mr. P. C. Cogan, C.E., Mr. Samuel Heron is the clerk of works, and Mr. J. A. Gordon, of Newtownards, is the contractor.

**EXTENSION OF THE SHIREHALL, WORCESTER.**—The extensions recently carried out at the Wor-

cester Shirehall provide some fifteen additional offices and rooms. This added accommodation is gained by raising the wings on the north and south sides one floor, and extending the south wing eastward. The floors and roofs are of fireproof construction, by Messrs. Homan & Rogers, and the roof is covered with asphalt. A complete system of fire mains and appliances has been laid down in connexion with the entire buildings. The whole of this work, also the heating generally, was carried out by Messrs. Ward & Son. The offices and corridors are lighted by electricity, the installation and work connected therewith being carried out by Messrs. Keen & Co. The builders' work has been executed by Messrs. J. Wood & Sons, of Worcester, and the work generally has been carried out from plans prepared by and under the superintendence of Mr. A. E. Rowe, on behalf of the County Surveyor, Mr. Henry Rowe.

**NEW POLICE-COURT, PENGE.**—On the 16th inst. a new police-court was opened at Penge. Mr. G. Elkington was the architect. In addition to a large court-house there are offices for magistrate's clerk, consulting-room for solicitors, &c.

#### SANITARY AND ENGINEERING NEWS.

**SEWERAGE DISPOSAL, CHELTENHAM.**—Colonel J. T. Marsh, R.E., Local Government Board Inspector, held an inquiry at Cheltenham on the 12th inst. into an application by the Cheltenham Town Council for sanction to borrow 15,400, for purposes of sewerage and sewage disposal, and for the appointment of an inspector to make an inquiry into the matter of certain works of sewerage and sewage disposal, which the said Council propose to construct, without the limits of the borough, and into certain objections which have been received thereto. Mr. Hall, Borough Surveyor, stated that in 1896 he reported on the state of the sewer from the Arle tank to the Barnham. He found the pipes unjointed and the gradients irregular. Roots had penetrated the joints, reducing the carrying capacity of the sewer by two-thirds. Complaints had been made by the tenant of the farm of the diminution in the supply of sewage, and compensation had been granted him. The improvements proposed would increase the carrying capacity to 1,350 gallons per minute. Similar facts were cited in connexion with other parts of the scheme. The inspector afterwards visited the districts affected.

**NEW RAILWAY STATION, ELGIN.**—A new railway station is to be erected at Elgin according to plans by Mr. P. M. Barnett, C.E., Engineer-in-Chief to the Great North of Scotland Railway Company. The contractors are: Masons' work, W. Jamieson, Elgin; carpenters, A. R. Dunbar, Elgin; slater, John Barclay, Buckie; plumbers, Blaikie & Sons, Aberdeen; plasterer, Mr. Gray, Elgin.

**SEA ENCROACHMENT AT DEAL.**—The Corporation of Deal have had under consideration for some time the question of the sea encroachment, and they have now decided to proceed with new works of sea defence near Sandown Castle at the north end of Deal. The Surveyor to the Corporation stated that unless these works of defence were undertaken at once the encroachment of the sea would undermine the existing wall and cause it to collapse. The urgency of the case was also emphasised by the Town Clerk, who said he had visited the spot, and the state of things so alarmed him that he had written to the Board of Trade pointing out that the whole of Deal was likely to be submerged if the wall went. The sea wall was much damaged by the heavy gales of several months ago, which carried away a shingle to such a depth as to leave the foundations exposed.

**A DERBYSHIRE WATER SUPPLY.**—During the past few months negotiations have been proceeding between the Belper Urban District Council and Mr. J. B. Marsden-Smedley, J.P., proprietor of the Dethick estate, for the acquisition of a water supply. It will serve the villages of Holloway, Crich, South Wingfield, Pentrich, and probably others. The population is about 7,000, and provision has to be made for 60,000 to 70,000 gallons per day. Mr. Marsden-Smedley is the engineer concerned, and he has gauged two springs on the Dethick estate, which yield about 200,000 gallons per diem. The agreement was laid before a special meeting of the Belper Council recently, and received the seal of the Authority.—*Nottinghamshire Guardian*.

#### FOREIGN.

**FRANCE.**—The Paris Municipality have not found any private contractors willing to take up the work for the Metropolitan Railway, and have determined therefore to have it carried out by their own staff of the "Voie Publique" service.—The railway station at Vincennes is being enlarged in view of the traffic for the Paris Exhibition, and it is expected proposed to establish an annexe of the Exhibition there.—The General Council of the Seine have under consideration a scheme for a canal between the Marne and the Seine.—A new Post and Telegraph building is to be erected at Orléans.—In carrying out some building work near the Prefecture at Angers, a carved stone coffin of the sixteenth century has been discovered.—Some paintings of the fifteenth century have been discovered on the walls of the

cathedral of Saint Dié, which have been previously concealed by woodwork of a later period. They are unfortunately much decayed.—At Bar-le-Duc, on Sunday last, was inaugurated the statue of Maréchal Exelmans, the work of MM. Roussel & Peynot, sculptors.—The landscape-painter Eugene Boudin, has died at Deauville, at the age of 73. He was born at Montpellier, and was a painter of great merit, who devoted himself almost entirely to painting the coast scenery of Normandy and Brittany.—The death is also announced at the age of 78, of a now almost forgotten artist, Eugene Gluck, who had however a reputation in his day. He attracted a good deal of notice in the Salon of 1844 by his picture of "the Jews and the Amalekites." He subsequently devoted himself to landscape, and also painted subjects for tapestries and falence.—The Historic Society of Passy intended to commemorate the arrival and reception of the Emperor and Empress of Russia in Paris by a monument to be erected near the railway station at Passy, for which M. Gustave Michel had already made a model. The Municipality, however, have refused to grant a sufficient site, and there is only to be a commemorative tablet erected on the spot where the Imperial party were received on leaving the railway.

#### MISCELLANEOUS.

**ST. BARTHOLOMEW'S HOSPITAL, OXFORD.**—The Charity Commissioners have lately held an inquiry into this ancient charity. They are of opinion that the authorities of Oriel College are still bound to provide lodging for the almsmen, to repair the hospital, and find a chaplain, and that the college, after paying the almsmen certain sums specified in the grant of 1328 and discharging other obligations, will be entitled to share in the profits of the property. The Commissioners have negotiated in the matter with Oriel College, and in the result have stipulated that the hospital chapel shall be reserved for such uses as they may by scheme provide; the other hospital buildings—whose site the college proposed to devote to building purposes—will, it appears, remain for the present, though without returning to their former uses as an almshouse.

**ELECTRIC LIGHT, SALFORD.**—Lieutenant-Colonel Albert C. Smith, representing the Local Government Board, held an inquiry at the Salford Town Hall on the 28th ult. into an application by the Salford Corporation for power to borrow 33,000, for purposes of electric lighting and 2,200, for the construction of storm-water overflows on the main intercepting sewer at Hough-lane, Springfield-lane, and Regent-road. From the opening statement of the Town Clerk and the evidence of the Borough Treasurer, the Electrical Engineer (Mr. C. L. Turner), and the Chairman of the Electricity Committee of the Corporation, it appeared that 37,774, has been already borrowed for the purposes of the electric installation, and that of the 33,000, now sought to be borrowed, £10,000 is required for land for a large new generating station at Strawberry Hill, Pendleton, 10,700, for electrical mains, and 11,300, for three battery sub-stations in the different districts of the borough, together with accumulators and the necessary machinery for charging and discharging the accumulators. With regard to the 2,200, required for storm-water overflows, Mr. J. Corbett, the Borough Engineer, stated that on the intercepting sewer by which the sewage of the borough was carried to the sewage works at Mode Hill there are at present three storm overflows. The additional overflows now proposed to be constructed were for a part of the sewer that was in the most populous part of the borough. At that point there were four and a half miles of intercepting sewer without any overflow to the main sewer, although there were some small overflows to the individual sewers. Frequent complaint had been made about the flooding of the district, and it was felt that something ought to be done to remove all cause of complaint.

**PUBLIC IMPROVEMENTS, ILFRACOMBE.**—Ilfracombe Council has decided to still further add to the recreation grounds of the town by the purchase, for 1,200, of a field at the west end—Bicklescombe—not far from Cairn Top, which will be turned into a sports ground. Having exchanged sites with the Wesleyan body, in order to extend the Ropery meadow in front of the Victoria Pavilion, the Council have been compelled to consider the advisability of widening the present markets, the new Wesleyan chapel having been built on one of the departments. A scheme has been prepared whereby the present markets can be doubled at a cost of about 5,000. There will be two markets, instead of the three as before, the space on the ground floors being increased from 5,800 sq. ft. to 11,700 ft., whilst there will be an additional space of 2,280 ft. provided in a 15 ft. gallery which will run round the second or lower market. The Council will shortly embark upon a drainage scheme, two being submitted by Mr. Mansergh, one at a cost of 20,000, and the other 30,000. **ANTIQUARIAN FIND, WISHAW, LANARKSHIRE.**—There has recently been discovered in the Cammethan Old Churchyard, Wishaw, a number of stones of considerable archaeological value. One in particular is of great interest, as it dates back to the period prior to the Norman invasion. To Mr. Alexander Napier, Wishaw, is due the credit of this



discovery. While searching in and around the churchyard for botanical specimens, he observed stones with quaint carvings. On making further search he discovered, lying half buried, a stone which, from the carvings on it, he concluded would probably be about 1,000 years of age, and of considerable antiquarian interest. The stone is 27 in. high, 16½ in. broad at the base, and 14½ in. at the top. In the centre there is a carving which at first sight appears very like a rude attempt to imitate the familiar coat of arms of the Mans, but instead of three there are four legs, and these are arranged so as to form a square. Underneath this, and standing 9½ in. from the ground, is a group of four figures. At the top is plaited work. Both sides of the stone seem to be similar in design, but it is broken and somewhat defaced.—*Edinburgh Evening Dispatch.*

**CHURCHYARD MEMORIAL, MARWOOD, DEVONSHIRE.**—A monument has just been erected in the churchyard of St. Michael's, at Marwood. The monument, which is to the memory of the late Mrs. Jury, is of white marble, and consists of a base of three steps, upon which stands a Calvary cross, in front of which is a colossal angel, sculptured in a solid block (angel, steps, and cross alike). The statue and its surroundings and accessories have been carried out by Messrs. Harry Hems & Sons, of Exeter.

**ALTAR, ST. MACCULLIN'S CHURCH, LUSK, CO. DUBLIN.**—A new high altar and two side altars have just been dedicated in the Church of St. Maccullin's, Lusk. In the last four years the building has been refitted, new altar railings have been erected, new Stations of the Cross have been placed on the walls, and the sanctuary is now lighted on each side by two lancet windows, from a design by Mr. J. J. O'Callaghan, architect, Dublin. The design and execution of the work in connexion with the high altar was entrusted to Messrs. Early. One of the side altars is dedicated to the Sacred Heart and the other to the Blessed Virgin. Over the altar dedicated to the Blessed Virgin is a picture of the Annunciation, and the altar of the Sacred Heart is also surmounted by another painting.

**COLLAPSE OF AN EDINBURGH BUILDING.**—An accident occurred in Edinburgh on Saturday last at a three-storied tenement, adjoining a building which had been demolished. Suddenly the tenement collapsed, and the wreckage fell on the shops beneath, smashing the stock, but the occupants got out in safety.

**THE KELMSCOTT PRESS, HAMMERSMITH.**—We learn that Mr. C. R. Ashbee has undertaken to design a fresh font of type for uses of the Kelmecott Press, the plant and presses having been purchased by the Guild of Handicraft from the executors of the late William Morris, and that among the first books to be issued will be Mr. Ashbee's translation of Benvenuto Cellini's treatises upon metal work and sculpture, with the illustrations (by arrangement) in M. Eugene Plon's book upon Cellini, the "Pilgrim's Progress," the poems of Burns, an illustrated description of the Guild's work, and accounts of famous buildings, as issued by the Committee for the Survey of the Memorials of Greater London. Morris's birthplace, a house on the Wims Estate, Walthamstow, has just been acquired by the local Council, who will convert the estate into a public recreation ground.

**NO. 10, CARLTON HOUSE-TERRACE.**—This house is offered for sale. It was erected for the late Alfred Morrison, and decorated for him by Jackson & Graham. The decorative work was designed by Owen Jones, who completed it shortly before his death on April 10, 1874. The designs and drawings had been exhibited in the Vienna Exhibition. They constitute the most important scheme of interior decoration carried out by Owen Jones in conjunction with the firm we mention, and may be compared with their joint work, also for Alfred Morrison, at Fonthill House. The scheme comprised the woodwork of the window-shutters, dado, doors, architraves, and panelling in the two entrance halls: the staircases, the ground and first-floor rooms—all being inlaid with different assorted woods: various chimney-pieces, grates, fenders, carpets, and wall-hangings, together with numerous articles of furniture, cabinets, and so on, in the style with which his name is so especially associated. The house is held from the Crown for an unexpired term of sixty-three years.

**THE PROPOSED CARTWRIGHT MEMORIAL AT BRADFORD.**—A meeting of the Cartwright Memorial Committee of the Bradford Corporation was held on the 12th inst. at the Town Hall, Bradford. Four block plans for the proposed new Memorial Hall in Lister Park were submitted by Mr. J. H. Cox, City Surveyor, and it was ultimately decided to submit the whole to Lord Masham for him to select the one of which he approves. The question of site will thus be settled, and it will remain for the Committee to secure competitive designs from architects before carrying out the scheme.—*Yorkshire Post.*

**RUSSIAN ANTIQUITIES.**—A Kiev paper reports some interesting archaeological discoveries recently made in that province on the estate of M. Khanenko, where there are several of the *kurgans*, or turtle-backed burial grounds, so common in many parts of Russia. The chief find was a cup, in form and design identical with the unique cup from Kul'-Ob, and unique itself in that it is of gold. A well-preserved Greek vase, with scenes from the mytho-

logy, and three gold plates for decorative purposes' engraved with, amongst other subjects, strange animals similar to those found on plates dug up in the province of Perm and in Siberia have been discovered. The greater number of the *kurgans* proved to have been already ransacked, but the discoveries, as described by the paper, appear to have been many and important. A Greek bronze helmet, with traces of gold inlaid work, was found close to the skeleton of a Scythian warrior, who lay with his bronze arrows and quiver strewn about him, and a slave lying across at his feet. Several skeletons of women were unearthed, all having ornaments of various metals about them. One lay beside a large oval slab of stone, evidently intended for sacrificial purposes. The largest of the burial places found beneath the *kurgans* has not yet been examined, so it is probable other finds may be made. The above objects, and many others, go to enrich M. Khanenko's private museum.—*Birmingham Post.*

### CAPITAL AND LABOUR.

**THE BRISTOL BUILDING TRADE DISPUTE.**—In connexion with the termination of the Bristol building trade dispute, a specially convened meeting of the Master Builders' Association was held on the 10th inst., at which recommendations of a committee of the Association were considered. Mr. C. A. Hayes presided, and on the motion of Mr. E. Walters, seconded by Mr. George Wilkins, the following resolution was agreed to:—"That, as the Bricklayers' Society has eventually accepted the mediation of his Honour Judge Austin, the members of the Bristol Master Builders' Association are prepared to act upon his Honour's suggestion—viz., to give the rise in wages forthwith; and as the federated trades and the Masons' Society have honourably stood by the award of the Board of Trade arbitrator (Mr. A. A. Hudson), the committee of this Association is prepared, as an act of grace, to recommend its members to grant a similar concession to those trades after next pay day."

**THE LANCASTER STONEMASONS' DISPUTE.**—The strike of Lancaster stonemasons, which has lasted fourteen weeks, has been ended. On Wednesday last week the men received an intimation from the executive of their society that the strike must end, and that no strike payments would be made after last week. A conference of masters and men was therefore held, and adjourned until the 12th inst., when a basis of settlement was agreed to, the lines laid down by the Manchester conference being decided upon. The men are to receive 9d. per hour at once, and an extra ½d. per hour next March, the question of short time in February being left to settle itself according to light.

**SETTLEMENT OF THE BOLTON PLUMBERS' DISPUTE.**—The dispute in the plumbing branch of the Bolton building trade has been settled and work resumed. The dispute had reference to the engagement of a number of Liverpool metallic pipe fitters at the Bolton residence of Mr. W. H. Lever, the Bolton men's allegation being that these workmen were doing work which should only be carried out by a certified plumber. The men from Liverpool were fitting a number of pipes at this particular mansion, and because a Bolton master plumber was doing the other plumbing work there the men were withdrawn from his establishment. The masters contended that this was a clear contravention of the rules agreed to between them and the men's society, and locked out the whole of the men in Bolton. The settlement has been brought about by the withdrawal of the Liverpool men from the job, but the work is being carried out by a Bolton plumber, under the supervision of the Liverpool firm affected. About 100 men were affected by the dispute, and they have been receiving from the society lockout pay.—*Manchester Courier.*

### LEGAL.

#### FELT DAMP-PROOF COURSES.

An appeal by Mr. Smith, a builder, of Edmonton, was heard at a special sitting of the Middlesex Sessions recently. The appellant was fined 5s. at the Tottenham Petty Sessions last May for laying a felt damp course in several houses in a new street off Gilpin-grove, Edmonton, which the Justices held was contrary to the following by-law of the Edmonton Urban District Council:—"Every person who shall erect a new building shall cause every wall of such building to have a proper damp course of sheet lead, asphalt, or slates laid in cement &c." Mr. Kemp, Q.C., Mr. Hume Williams, and Mr. W. Grantham represented the appellants, and Mr. Macmorran, Q.C., and Mr. Glen appeared for the District Council.

The case was re-opened by Mr. Macmorran, who first called the Building Inspector of the Council, Mr. Cross. This witness said he saw the damp-course after it was laid. He had previously warned Smith not to use the felt, as summonses had already been taken out against him for laying a felt damp course in other houses. (These proceedings took place last year, and resulted in the conviction of Smith, but there was no appeal in respect of that.) Witness saw no trace of cement under the felt. He

was of opinion that the felt was not a suitable material for a damp course.

Mr. G. Eedes Eachus, Surveyor and Engineer to the Council, said the felt was an improper material for a damp-course. In his judgment it was not durable and impervious to moisture.

Cross-examined by Mr. Kemp, witness said that in parts of the buildings felt was laid without cement being used, either above or below. He did not know that in other districts felt damp-courses were permitted, but he had not the least doubt that they were used.

The Chairman (Mr. Montague Sharpe) asked witness whether, if the felt were laid in mortar, it would be impervious to moisture?

Witness: It would have to be the very best cement mortar, with very little sand.

Mr. George R. Crickmay, architect and surveyor, Westminster, said he visited the houses in which the felt damp-course was laid. He saw a small trace of mortar, but no cement, near the damp-course. He tested the felt, and was satisfied it would absorb a great deal of water, and would allow moisture to pass through. It would last for only a very short time.

Mr. Gordon, architect, Blomfield-street, E.C., said he immersed a sample of the felt in water for forty-eight hours, and found that it had increased 1½ weight from 1½ oz. to 3 oz. Such a material would neither be durable nor impervious to moisture.

Mr. H. W. Dobb, architect, London Wall, was also called and examined in support of the Council's case.

The defence was that as the houses were not of a very high-class character for letting purposes, money was of importance to the builder consistently with a due compliance with the by-laws. The Surveyor to the Edmonton Council desired that the builder should use an expensive material which was not insisted upon by the surveyors of other Councils, but experts and practical men were of opinion that the material which the appellant was using on the houses in question was perfectly fit for the purpose for which it was required. It was "a durable material, impervious to moisture," which was what the by-laws required.

Mr. John Harrison, architect, was called and said he specified the material for the buildings, as from his experience he thought it was very suitable for small property. It was largely used all over England, and he had constantly used it since 1860. It was used in the Borough of Windsor, at Egham, Fulham, Sydenham, Thornton Heath, Croydon, &c. Mr. Otto Hehner said he had tested the material. One test was to immerse a piece in water for twenty-four hours; then, after hanging it up in the air for a short time, to allow the adherent water to drain off the surface, he weighed the material and found it practically of the same weight as it was before immersion. Another test was to affix a glass tube, 8 ft. long, 1 in. in diameter, to the surface of the material, and then fill the tube with water so that there should be a pressure of water on the material. This test lasted for twenty-four hours, and on examining the material no absorption of moisture was perceptible.

Mr. William Baker, C.E., Mr. Arthur Hogwood, architect and surveyor, Mr. Reuben Knox, builder, and Mr. Wm. Schofield, builder, gave evidence in favour of the material, the latter stating that he had used it in Clapham, Battersea, and in Chancery-lane without any objection being made to it. The superlunant weight of the building would tend to hammer it and make it more impervious and durable.

Evidence of workmen on the buildings in which the appellant had used the material was likewise called to show that it was not laid on the bare bricks, but was embedded below and above in mortar, with which a proportion of cement was mixed.

The court retired for a few minutes, and, on returning, the Chairman said that having carefully considered the evidence for and against they were of opinion that the conviction must be upheld. The appeal would, therefore, be dismissed with costs.

#### ROBERTSON v. THE CORPORATION OF BRISTOL.

The case of Robertson v. The Corporation of Bristol came before Mr. Justice North in the Chancery Division on the 11th inst., on a motion by the plaintiff *ex parte* for an injunction to restrain the Corporation of Bristol from carrying out a proposed alteration of the plaintiff (the owner of a building estate at Bristol) in Robertson-road, St. George's, into the roadway. The Corporation alleged that they had power under Section 150 of the Public Health Act, 1875, to widen the roadway by throwing into it a portion of the footway.

His Lordship declined to grant an injunction *ex parte*, but gave the plaintiff leave to serve notice of motion before the Vacation Judge for Wednesday the 17th inst.

#### WIDDOWSON v. BARNETT.

At the Birmingham Summer Assizes on the 11th inst. Henry Widdowson, of Wilton-road, Aston, asked for an order for 78s. 2s. 6d. from David Barnett, of 51, Aston-road North, for work done. Plaintiff contracted with defendant to repair certain



houses in Oak-lane, West Bromwich. The work was to be done to the satisfaction of Mr. Devall, architect, Birmingham, and he duly gave his certificate that the work had been carried out properly. Defendant, however, contended that it was incomplete, and not according to contract, and refused to pay on the architect's certificate. His Lordship, however, awarded plaintiff the verdict for 70*l.* 18*s.* 6*d.*, the amount due on the contract, without extras.

#### DISPUTE BETWEEN THE OWNER OF A BUILDING ESTATE AND THE CORPORATION OF BRISTOL.

The case of *Robertson v. the Bristol Corporation* came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 17th inst. It was an application by the plaintiff, Mr. Samuel Robertson, for an *interim* order restraining the defendants from interfering with a footway and curbing in a road on a building estate belonging to the plaintiff.

Council for the plaintiff said that in the year 1800 the plaintiff purchased a building estate in the parish of Easton in the jurisdiction of the St. George's Local Board, and he laid out that building estate in roads and various building plots, according to the beacons of the Urban District Council of St. George's, which required plans to be deposited. The plaintiff accordingly prepared and deposited plans, showing how he wanted to lay out his building estate.

His Lordship said that he had read the affidavits which had been filed and from them it seemed to be a very difficult matter to decide.

Mr. Glyn, for the Corporation, said that all the plaintiff wanted was for the Corporation to make the pavement a little wider than they proposed to make it under the provisions of the Public Health Act. The work was nearly finished and he suggested that the Corporation should finish such a pavement as they proposed to be in the wrong at the trial they could undertake to add to the pavement what the Court ordered. He suggested that his Lordship should order the motion to stand till the trial on this undertaking being given.

Council for the plaintiff said that if this course were pursued it would be inconvenient for all parties because, if the Corporation were going to finish the pavement to the width they said they were, they would proceed with the sewerage, channelling, and so forth. It would be exceedingly inconvenient to have the road up two or three times. The learned counsel said that the Corporation were entirely wrong in proceeding under Section 150 of the Public Health Act. The point was this: At the time the plaintiff laid out this estate he was within the jurisdiction of the St. George's Urban District Council, and he deposited his plans and made his roads. Those plans were approved, and then, in 1807, the St. George's Urban District Council was absorbed in the City of Bristol, and thereupon the city without any notice to the plaintiff, commenced to lay out the street in, as it was said, a suitable manner to the City of Bristol. When the plaintiff laid out his estate he had a very good reason to lay out the road in question at the width he did, and which was even at a greater width than the St. George's Urban District Council required. The plaintiff required a handsome entrance to his estate. The whole place was now in a state of uproar and confusion, and if the defendants were allowed to finish the work as they proposed, and the matters in dispute were to stand till the trial, the plaintiff would suffer great inconvenience.

His Lordship said he could not agree with this suggestion of the learned counsel, and after some further discussion it was arranged that the motion should stand till the trial on the defendants undertaking to alter the pavement to the width which the Court should ultimately determine (if necessary).

#### ACTION AGAINST THE AERATED BREAD COMPANY TO RESTRAIN BUILDING OPERATIONS.

MR. JUSTICE PHILLIMORE, sitting as Vacation Judge on the 17th inst., had before him the case of *Stop v. The Airy Bread Company, Limited*, which was a motion by the plaintiff to restrain the defendants from carrying on certain building operations, &c.

Mr. Alexander, Q.C., for the plaintiff, said that Mr. Jennings, who appeared for the defendants, was willing to give an undertaking in the terms of the notice of motion extending over the 20th inst. when the motion would be on.

Mr. Jennings said he would give the undertaking mentioned.

His Lordship: Very good.

Order accordingly.

#### MEETINGS.

SATURDAY, AUGUST 20.

Northern Architectural Association.—Visit to Flour Mills, Dauston.

#### RECENT PATENTS:

##### ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until September 27.

16,780.—**ROOFS AND ROOFING:** *F. Beer, jun.*—To improve the structure of the roof, the parts of the gravel ledge and of the e'g line are enabled to expand and move lengthwise independently of the parts underneath the roofing material, the exposed parts being made of metal soldered together to one another not to those parts which do not expand.

16,818.—**MATERIAL FOR RENDERING DOORS AND WINDOWS AIR-TIGHT:** *E. Mittelsten-Scheid.*—The material is made of list or a band to which a cord, twine, or plush is plaited or woven, and may be, in whole or in part, of wool or cotton.

17,175.—**SAFETY DEVICES FOR CATCHING WORKMEN AND PREVENTING INJURY TO THEM WHEN WORKING IN DANGEROUS PLACES:** *J. B. Fondou.*—The invention, which is particularly applicable for use in glass factories, wherein the workman blows long tubes of large diameter in a series of pits, comprises a device by which suspending supports within the pits, and laying mattresses therein, so that the workman, if he falls, will not injure himself on the broken glass beneath.

17,553.—**MANUFACTURE OF SLABS OR TILES:** *G. A. Marsden & J. Neuton.*—For making what are known as safety-back tiles, with undercut or dove-tail recesses for facing walls, the inventors affix to the top or bottom die one or more straight or curved metallic strips by which the strips being removable when the dies are required for making plain tiles.

17,611.—**DOOR KNOB FURNITURE:** *R. H. McFarland, J. McFarland, & D. S. Frey.*—The die list in developing a spindle which is divided lengthwise to form two halves, triangular in section, each of which has a tapered opening in its opposite end, in which pin-screws work to abut against the flat opposing surface of the triangular half spindle, and pass through vertical openings in the door knobs; the pressure which retains the knobs is equally divided on all sides of the square holes therein, whilst the knobs may be pushed in towards one another, since the pin-screws do not protrude beyond the bases of the triangular pieces.

17,817.—**AUTOMATIC SLUICE VALVE, ESPECIALLY ADAPTED FOR HOUSE DRAINAGE:** *H. W. J. McHardy.*—The special features of the contrivance consist of (1) a slide or door, which is normally retained in its upper or closed position by pawls or levers, and is released in case of lack-water by a float that acts upon the levers, and is guided by a roller into a wedge-shaped guide groove of the water passage; and (2) the partial lengthwise division of the sluice valve into halves for insertion of the inspection and cleaning of the interior whilst the sluice valve is being mounted.

19,001.—**ICE-MAKING MACHINES:** *G. V. Maxted & C. McDermott.*—The machine's main frame consists of, preferably, two heavy plates or heads standing vertically, to which are bolted the mixing or tempering tubs; within form of an archimedean screw, the presses consist of heavy wings, mounted on horizontal shafts within the mill, and are operated by a notched segment which is mounted on the shaft and engages with a pawl at one end of the regulator arm; the pawl is made in two hinged parts so that it may yield under any undue pressure caused by a foreign obstacle.

20,681.—**KITCHENES:** *F. J. Brown.*—The oven is constructed so that it may be lifted in and out through the front plate, and the boiler is constructed so that it can be dropped into position and held firmly without screws; the boiler has a lock cover made in two parts, and its hob has an open space formed through it large enough for the boiler to pass through, with a seating for flanges on the outside top edges of the boiler to rest upon.

20,910.—**PESSING BEERS, TIPS, &c.:** *N. Collier.*—A vertically movable bottom plate is combined with expanding rests or seating together with mired, splayed, or curved joints between the same; the vertically movable bottom plate or die has insular linings adapted to engage a set with springs, in order to vary the thickness of the brick or tile.

21,385.—**WINDOW SASHES:** *J. Hayton.*—To provide ready means for cleaning, repairing, or reversing the sashes, the sashes are each provided with an extra piece, called the "loose stile," whose engagement or disengagement is effected as follows: a pin bolt passes through the inside of the sash stile, and is grooved at one end to engage a slot in a plate recessed in that side of the loose stile nearest the sash stile; the bolt's other end projects from the side of the sash stile in front of the glass, and has a lever or thumb-piece for its rotation; at about its middle length the bolt has a helical groove engaging a set screw in the sash stile, the loose stile is freed from the sash stile by a partial rotation of the bolt; studs or snugs in the side of the loose stile engage in the sash stile and so ensure the former's sliding with the sash, when the sashes are locked together; the sashes are rendered weather-tight by rebating the loose stile to engage with rebates in the side-frames, and the parting slip or lath, the latter being made T-shaped to the parting for removal of the sash an open-ended slot may be formed in the plate which engages the bolt, or the plate may be made in two parts each having a semi-circular hole to fit round the bolt.

21,394.—**URINALS:** *P. Bright.*—For urinals which consist of one or more upright semi-cylindrical compartments or stalls with bases that deliver the flushing water into a gutter in front of the stalls, the inventor makes the channel between the base or floor open and uncovered at the top—in order that it may be more readily cleaned and inspected—and provides a grating, which can be lifted or raised on a hinge, to lie over the gutter and the open channel.

21,623.—**ELECTRICAL CONNECTING DEVICES, APPLICABLE TO LAMP-HOLDERS, WALL PLUGS, &c.:** *C. L. R. E. Menges.*—A feature of the invention is that the force is obtained by screw action, whilst the plug of the ordinary bayonet holder may be employed; the holder has a moveable sleeve fitted with helical surfaces or slots with which the projecting pins on the plugs engage, so that by turning the plug whilst its end-face bears upon the contacts in the holder, it screws the sleeve up so as to compress or extend a spring on the latter, and thus presses together the contacts for transmission of the current; in order to prevent the plug from turning back again of its own accord, small recesses are formed at the extremities of the helical surfaces, which act (in a measure) as oppositely inclined screw-threads and, under the spring action, tend to prevent the plug to screw itself still further in, without however rendering it impossible for any one to unscrew the same by hand.

21,671.—**WATERPROOF (CAVITY) JOINT FOR ROOF AND OTHER BOARDS:** *J. Wilson.*—Water entering the upper section of the joint is carried away on the bed of the channel-like joint; a raised nib prevents water from passing through the joint's lower section, and the waterproof joint is completed by the circumstance that the water has not follow up the other (hanging) nib which is not allowed to come into contact with the raised nib.

18,981.—**EASSELS:** *E. Dyonnet.*—The apparatus comprises two adjustable stands, which may be connected by an extensible cross-bar, and have pivoted clamping frames to hold the block or canvas in position.

19,721.—**SUSPENDED ELECTROLYTIC:** *J. G. S. Cunningham.*—The framework is a fixture. Each of the lamps is carried by a conducting cord running over a pulley on an arm of the electrolyte and over a pulley fixed at the top of the frame; each cord is then looped and in the loop is received the pulley of a weight. As a modification, each of the conducting and suspending cords is caused to take a direction parallel to that of the electrolyte's hanging rod and arms by being passed under an additional pulley which may be on the electrolyte's central boss.

#### NEW APPLICATIONS.

August 2-6.

16,670, H. M. Darrah, Cut-outs for High Voltage Currents. 16,680, R. Whitfield, for Removal of Pitch from Paving-stones, Blocks, &c. 16,697, Kossborough & Fife, Treating Clay for the Manufacture of Bricks, Tiles, &c. 16,700, G. J. E. Copping, Ventilators. 16,701, J. B. Williams, for Augmenting the Delivering Capacity of Gravel, for Water-supply Mains. 16,706, E. Wilson, Electric Supply Meters. 16,714, C. P. Steinmetz, Electrical Distribution. 16,713, E. Evans; 16,884, J. Varon; 16,894, J. V. M. de Montis; 16,903, M. de Montis; and 17,008, Read, Holliday & Sons, and Another, Generation of Acetylene Gas. 16,734, H. G. Carleton, Electric Locks. 16,743, E. Breshner, Keyless Locks. 16,746, Miller Lock Company, U.S. Latch Locks. 16,765, Stillman & Statham, Kitchen Ranges. 16,766, Orme & Howarth, Gas Meter Prepayment Mechanism. 16,770, W. Furnival, Automatic Lighting of Street (Gas) Lamps, &c. 16,777, A. Patrick, Cement. 16,783, J. Robertson, Square for Use upon Mouldings, &c. 16,785, H. O. Strong, Gas Stoves for Heating. 16,791, Wassermann, Coverings for Floors or Walls. 16,801, J. Hampton, sen., Tools for Centring Cylindrical and other shaped bodies. 16,802, H. W. Hill, Automatic Calculating Machine. 16,818, R. F. Fitch, Lock Casing and Fitting same. 16,819, L. McNair, Ventilation of Mines. 16,820, D. Noble, Friction Clutches and Another, Generation of Acetylene Gas. 16,834, C. U. E. Peterse, Automatically Regulated Charging of Electrical Accumulators. 16,835, E. Oberlander, Latent Work, &c. 16,845, Phillips & Glass, Circular Saw Guards. 16,850, D. Roche, Structure for Use for Decorating, Painting, and Similar Purposes. 16,870, J. Kerr, Brush Holder for Pencil's Use when Working with a Side Aid of a Pole. 16,875, E. Schattner, Electricity Meters. 16,882, M. Hansen, Heating and Cooking by Electricity. 16,915, Payne & Edwards, Moulding Bricks, &c. 16,916, P. Brennan, Portable Winch or Hauling Appliance. 16,918, A. J. Andrews, Fences and Guards for Circular Saws, Applicable to other Machines. 16,919, MacLaren & Gale, Flexible Joints for Cast-iron Pipes. 16,922, Draper & Others, Builders' Doors. 16,923, Partly Applicable to Fireproof Doors for Buildings. 16,927, Dodd & Bagnall, Arc Lamps. 16,948, Brachvogel & Müller, Water-Raising Apparatus. 16,972, T. McEwan, Joining-boxes for coupling up and insulating Electrical Wires. 16,973, General Electrolytic Company and Others, Electrical Conductors and Anodes. 16,974, T. W. Twyford, Sinks, Lavatory Basins, Slip Hoppers, &c. 16,981, D. Maxwell, Electric Wiring for Lamp Circuits. 16,989, Daws, Feed Mechanism of Percussive Rock Drills. 16,991, W. Branford, Flooring-cramp. 17,000, H. Harrison, Kilns for Bricks, &c. 17,005, Metal Tube Joining Company and Another, Tool for Knurling the Interiors of Tube-sockets. 17,016, L. M. Waterhouse, Iron and Steel Tube Manufacture.

#### SOME RECENT SALES OF PROPERTY

##### ESTATE EXCHANGE REPORT.

July 28.—By MESSRS. SPELMAN (at North Walsham).  
North Walsham, Norfolk.—Freehold residence and 2 a. 3 r. 23 p. ..... £2,000  
By WORSFOLD & HAWWARD (at Dover).  
Dover, Kent.—Park-pl. (rear of), two sets of stabling, u. l. 72 yrs. 3 r. 19 s. .... 365  
River, Kent.—A freehold building site, 27 a. 1 r. 37 p. .... 1,500  
Enclosures of land, 45 a. 2 r. 24 p. f. .... 1,550  
Alkham, Kent.—Enclosures of land, 38 a. 2 r. 30 p. f. .... 300  
By COOPER & PREECE (at Ross).  
Weston-under-Penyard, Hereford.—The Seabrook and Wigmore Estate, 105 a. 1 r. 17 p. f. .... 3,750  
By ARTHUR BLACKFORD.  
Holloway.—23, 91, and 95, Marlborough-rd., u. l. 69 yrs. 3 r. 18 s. .... 900  
Barnsbury.—36 and 38, Dorinda-st., f. .... 700  
By DRIVERS.  
Holloway.—40, George-st., u. l. 36 l. .... 500  
By HAMILTON & MIALl.  
Holborn.—3 and 4, Devonshire-st., u. l. 22 yrs. 3 r. 13 p. .... 120  
Peckham.—33, Hill-st., u. l. 27 yrs. 3 r. 41 p. 38 l. .... 205  
By G. B. HILLIARD & SON.  
Fryerning, Essex.—Lyndsay's Farm, 46 a. 3 r. 32 p. c. .... 1,450  
An enclosure of land, 72 a. 3 r. 21 p. c. .... 370  
By DEBENHAM, TEWSON, & CO.  
Lewisham.—211, High-st., area 15,300 ft. f. .... 3,050  
Marylebone.—16 and 17, High-st., u. l. 244 yrs. 3 r. 26 p. f. 235 l. .... 2,610  
Eastbourne, Sussex.—Silverdale, Freshfield, f. 1,800  
Brentwood, Essex.—Brook-st.-hill, f. 40 l. 10 s. reversion in 69 yrs. .... 1,000  
By FARRERBYR, ELLIS.  
Dagenham, Essex.—Horse Shoe Corner, an enclosure of freehold land, 34 a. 3 r. 13 p. .... 3,000  
Abbey Wood, Kent.—Hospital, Old Park and 13 a. 3 r. 38 p. u. l. 15 yrs. 3 r. 23 s. 6 d. l. 100 l. .... 500  
By C. C. & MOORE.  
Mile End.—49 and 51, Grafton-st., u. l. 51 yrs. 3 r. 94 p. f. 64 l. .... 735



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. supplied by.	Time for delivery.	Nature of Work or Materials.	By whom Required.	Form of Tender, &c. supplied by.	Time for delivery.
By the North London Ry. Co.	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	Street Works (several lots)	Buckhead Corp.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	*Surface Water Drains	Cumtender U.D.C.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	*Electric Light Station Buildings	Bury St. Edmund's	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	*School Buildings	Walsingham S.B.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	*Agricultural (mills)	Birmingham Corp.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	*New Ward at Hospital	Epiphany D.C.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	*Additions, &c. at Workhouse	Walsingham S.B.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	Church, &c. at Workhouse	Walsingham S.B.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.	Boundary Walls, &c. at Workhouse	Walsingham S.B.	By the North London Ry. Co.	By the North London Ry. Co.
Water Main	London Ry. Co.	By the North London Ry. Co.	By the North London Ry. Co.				

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Appointments to be made.
Chief Clerk of the Court	By the Court	£1,000 per annum	Aug. 22
Chief Clerk of the Court	By the Court	£1,000 per annum	Aug. 22
Chief Clerk of the Court	By the Court	£1,000 per annum	Aug. 22
Chief Clerk of the Court	By the Court	£1,000 per annum	Aug. 22
Chief Clerk of the Court	By the Court	£1,000 per annum	Aug. 22

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. 19. vi. and vii. Public Appointments, pp. xvii. xviii. &amp; xix.

Limehouse—33 to 43 (odd), Farnace-st., u.t. 46 yrs., g.r. 161. 108.	£1,215	Barking.—Longbridge, &c., 115 plots of building land, f. (in lots) July 29.—By H. F. RUSSELL (at committee).	£5,450	Three enclosures of land, 18 a. 2 r. 12 p. f. ....	£378
90 and 108, St. Paul's-rd., u.t. 61 and 75 yrs., g.r. 101.	690	July 29.—By H. F. RUSSELL (at committee).		Westleton, Suffolk.—Various enclosures, 26 a. 2 r. 12 p. f. ....	330
4, Aston-st., u.t. 28 yrs., g.r. 36.	235	By F. W. BECK (at East Dereham).	2,900	August 4.—By R. & A. G. THOROWGOOD (at Bishop's Stortford).	
Upton Pk.—Rutland-rd., two building plots, f. 1.	375	By F. W. BECK (at East Dereham).	1,300	White Roothing, Essex.—Kingston's Farm, 8 a. 0 r. 38 p. f. and c. r. 450.	£560
Hackney—142, Amhurst-rd., u.t. 68 yrs., g.r. 61, r. 60.	600	By CLIMPTON & JOHNSON.		Berden, Essex.—Two freehold cottages, r. 181.	280
Commercial-rd., E.—No. 359, u.t. 39 yrs., g.r. 304, r. 80.	600	By CLIMPTON & JOHNSON.		Stepney.—182 and 184, Stepney Green, f. r. 681.	1,000
West Ham—10, 12, 14, and 16, Dirleton-rd., f. ..	685	By CLIMPTON & JOHNSON.		By GIDDY & GIDDY.	
Puckhurst Hill—2, 3, 4, and 4, Alpha-rd., u.t. 85 yrs., g.r. 187, r. 101.	625	By CLIMPTON & JOHNSON.		St. Marlow, Bucks.—The Lyric and 1 acre, u.t. 53 yrs., g.r. 87.	700
Bethnal Green—122, Cambridge-rd., f. r. 301.	610	By DOWSETT & MANN.	255	By D. L. GOUGH.	
Tottenham—3, Grove Park-rd., u.t. 84 yrs., g.r. 61.	280	By DOWSETT & MANN.	590	Thorton Heath—36, Parchment-rd., f. r. 281.	480
90 and 11, Newton-rd., u.t. 76 yrs., g.r. 91.	160	By DOWSETT & MANN.	415	Anerley—100, Croydon-rd., u.t. 97 yrs., g.r. 131, r. 651.	820
Tottenham—Riverdale-ter., f. g.r. 361, reversion in 99 yrs.	950	By A. & A. CLARK.	2,400	By MORGAN, BAINES, & CLARK.	
Bethnal Green—10 to 20 (even), Church-row and 1, Wood's Close, f. ..	3,570	By A. & A. CLARK.	845	Feicham, Surrey.—Fifty Cottage, &c. ....	300
Limehouse—35 to 40 (even) and 48, Eastfield-st. and 57a, 70 and 72, Aston-st., f. ..	2,240	By A. & A. CLARK.	1,700	Woking, Surrey.—Maybury-rd., The Firs, f. ....	670
By NEWCOMB, EDWARDS, & SHEPARD.		By A. & A. CLARK.	1,200	Wotton-rd., four plots of building land, f. ....	272
Holloway—64, Drayton-pk., u.t. 76 yrs., g.r. 101, r. 701.	960	By A. & A. CLARK.	600	August 5.—By G. B. HILLIARD & SON (at Chelmsford).	
Islington—8, Union-st., u.t. 38 yrs., g.r. 51, 55.	355	By A. & A. CLARK.	245	Billerica, Essex.—Two enclosures, 7 a. 0 r. 16 p. f. ....	400
Halls Pond—63, Poppy-bury-rd., f. r. 261.	335	By A. & A. CLARK.	400	By J. HOWELL, THOMAS & SON (at Whitland).	
Barbary—46, Connaught-st., u.t. 44 yrs., g.r. 41, f. 301.	830	By A. & A. CLARK.	1,130	Kiffing, Carmarthen.—Three building sites, 2 r. 10 p. f. ....	110
King's Cross—46, Connaught-st., u.t. 44 yrs., g.r. 41, f. 301.	830	By A. & A. CLARK.	380	Trevingham Farm, 18 a. 3 r. 37 p. f. ....	5,390
Bowes Park—10 and 20, Myddleton-rd., f. r. 761.	900	By A. & A. CLARK.	5,370	Middleway Farm, 90 a. 0 r. 4 p. f. ....	2,775
Stepney—374, Commercial-rd., East, f. r. 451, r. 701.	1,400	By A. & A. CLARK.	140	Great Pale Farm, 48 a. 2 r. 31 p. f. ....	6,400
Chelsea—25, Walton-st., u.t. 44 yrs., g.r. 91, r. 701.	3,800	By A. & A. CLARK.	330	Cwmcolly Holding, 12 a. 1 r. 10 p. f. ....	400
Holloway—130 and 132, St. James's-rd., u.t. 45 yrs., g.r. 131, r. 1131.	1,400	By A. & A. CLARK.	140	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
By SIMMONS & SONS.		By A. & A. CLARK.	140	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Drury-lane—33, 34, and 35, Great Will-st., f. ..	1,850	By A. & A. CLARK.	435	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Newington—127, Newington-causeway, u.t. 65 yrs., g.r. 61, r. 251.	600	By A. & A. CLARK.	380	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Brixton—30, Crowhurst-rd., u.t. 63 yrs., g.r. 91, r. 631.	600	By A. & A. CLARK.	1,650	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
13, Pope's-rd., u.t. 70 yrs., g.r. 51, r. 341.	610	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Blackfriars—57, 59, and 61, Gray-st., u.t. 37 yrs., g.r. 101, r. 101.	560	By A. & A. CLARK.	790	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Horne Hill—131, Dulwich-rd., u.t. 48 yrs., g.r. 101, r. 601.	300	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Horne's—2 and 4, Enfield-rd., u.t. 79 yrs., g.r. 81, 108.	400	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Balham—8, Drakefield-rd., u.t. 91 yrs., g.r. 81, Fulham—88 and 90, Sherbrooke-rd., u.t. 84 yrs., g.r. 111.	430	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Norbury—12, two plots of land, f. ....	600	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Walworth—47, Penrose-st., f. r. 341.	755	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
30 and 31, South-gate, f. ....	580	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Lambeth—40, Lambeth-rd., f. r. 451, f. 451.	670	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
By RENDELL & SYMONS (at Newton Abbott).		By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Lustleigh, Devon.—Barne Court Estate, 113 a. 1 r. 13 p. f. ....	1,995	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310
Enclosure of land, 13 a. 1 r. 30 p. f. ....	470	By A. & A. CLARK.	1,555	Brumant Farm, 85 a. 3 r. 30 p. f. ....	310



**CARLISLE**.—For the erection of lodging-house, Lower street, near the Grosvenor Hotel, Grosvenor Company Limited. Mr. H. Higginson, architect, Carlisle. Quantities by the architect :—  
*Arch.*—J. & R. Bell..... } £90  
*Joinery*—H. Hartwell..... }  
*Slatting*—Wm. Anderson..... }  
*Painting*—J. Hewlison..... } £493 17  
*Plastering*—H. Hartwell..... }  
*"*—A. H. Hoar..... }  
*Painting*—W. N. Balfournie..... }  
[All of Carlisle.]

---

**CARLISLE**.—For the erection of house and barn, Hawththill, Mr. Mr. W. Wood, 22, Mr. H., ..... architect, Carlisle.  
*Arch.*—E. J. Tasker..... }  
*Ridging*—Langstaff & Son, Hawththill..... }  
*Joinery*—T. H. Robinson..... } £56 8  
*"*—C. S. Hoar..... }  
*Slatting*—J. Hewlison, Carlisle..... }  
*Plastering*—A. Scudamore, Hawththill..... }  
*Painting*—T. Snowball..... }  
[All of Carlisle.]

---

**CARLISLE**.—For alterations and additions to business premises, English-street, Carlisle, for the Carlisle Café Company. Mr. H. Higginson, architect, Carlisle. Quantities by the architect :—  
*Joinery*—J. G. Foster..... }  
*Plumbing*—W. Forster..... } £400  
*Plastering*—Ferguson Sons, Hawththill..... }  
*"*—R. S. Kirk..... }  
[All of Carlisle.]

---

**CARLISLE**.—For the erection of dwelling-house, Howards-lane, Carlisle, for Mr. Smith. Mr. H. Higginson, architect, Carlisle. Quantities by the architect :—  
*Arch.*—J. & R. Bell..... }  
*Joinery*—H. Hartwell..... }  
*Slatting*—Wm. Anderson..... } £118 0  
*Painting*—R. M. Omerod & Son..... }  
*"*—R. S. Kirk..... }  
[All of Carlisle.]

---

**CARLISLE**.—For the erection of two shops and dwelling-house, Hawththill, for Mr. W. Bell, Glaidland. Mr. H. Higginson, architect, Carlisle. Quantities by architect :—  
*Arch.*—Langstaff & Son, Hawththill..... }  
*Joinery*—T. H. Robinson, Hawththill..... } £149  
*Plumbing*—W. Anderson, Carlisle..... }  
*Plastering*—Wm. Barker, Brampton..... }  
[All of Carlisle.]

---

**CARLISLE**.—For the erection of houses and shops, West Tower street, for Messrs. Dixon. Mr. H. Higginson, architect, Carlisle. Quantities by architect :—  
*Arch.*—W. & H. Davidson..... }  
*Joinery*—Graham & Crawford..... } £1,438 12  
*Slatting*—T. Kellet..... }  
*Plastering*—S. Ferguson & Sons..... }  
*Painting*—R. W. Westray..... }  
[All of Carlisle.]

---

**CARLISLE**.—For erecting savings bank, Fisher-street, Carlisle. Mr. H. Higginson, architect, Carlisle. Quantities by the architect :—  
*Joinery*—E. J. Hull..... }  
*Joinery*—J. G. Foster..... } £450  
*Slatting*—D. Armstrong..... }  
*Plastering*—R. M. Omerod & Son..... }  
*Painting*—R. W. Westray..... }  
[All of Carlisle.]

---

**CORK**.—For alterations to business premises, 23, Patrick-street, Messrs. Harvey. Mr. Arthur Hall, architect, 23, George-street, Cork. Dennis O'Callaghan..... £470     Antony Gaul\*..... £470  
Mr. Kearns..... 480     \* Accepted.

---

**CRAWLEY** (Sussex).—For extension of sewers at Crawley, for the Horsham Rural District Council. Mr. H. Bustow, architect and surveyor, Horsham :—  
*Arch.*..... £445     \* Easton, Crawley\*..... £535  
*Book-keepers*..... 445     \* Accepted.

---

**CRAWLEY** (Sussex).—For erecting shops and houses at Crawley, or Mr. M. Nightingale. Mr. C. H. Bustow, architect and surveyor, Horsham :—  
*Arch.*..... £1,590     J. Ockenden & Sons, Crawley (accepted)..... £1,559  
*Book-keepers*..... 1,590

---

**CROYDON**.—For additions and alterations to "Earl Russell" public house, Gloucester-road, for Messrs. Page & Overton, Limited. Mr. A. Broad, architect, 22, George-street, Croydon.—  
W. Smith & Son..... £68 1/2     J. Smith & Sons..... £64  
E. Couder..... 68     A. Bullock (accepted)..... 64

---

**CROYDON**.—Accepted for erecting a pair of semi-detached houses, Woodstock-road, Mr. A. Broad, architect, 22, George-street, Croydon. W. Pearson & Co..... £1,550

---

**CROYDON**.—For erecting two cottages, Waddon Old-road. Mr. A. Broad, architect, 22, George-street, Croydon.—  
M. Abbotts..... £790     W. Pearson & Co.\*..... £790  
B. Webb & Watson..... 790     \* Accepted.

---

**HORSHAM**.—For erecting a house at Eastlands, Billingshurst, for Mr. M. Moore. Mr. C. H. Bustow, architect and surveyor, Horsham :—  
Wadey & Sons..... £750     J. Ockenden & Sons..... £750  
Marston..... 750     H. Spooner, Leweswood\*..... 650  
\* Accepted.

---

**KENLEY**.—Accepted for bar fittings at the "Kenley Hotel," Kenley, Surrey, for Maider & Collyer Brewery Company, Croydon. E. Simpson & Mabe, Peckham..... £455

---

**KENDAL**.—For erecting girls' and infants' schools, Castlestreet, Kendal. Mr. R. Walker, architect, Windermere :—  
*Arch.*—Park Bros..... }  
*Plumbing*—J. R. Farmer..... } £503 4  
*Painting*—W. Jackson..... }  
[All of Kendal.]

---

**LONDON**.—For wiring for electrical installation, and for gas services at the Cranborne Hotel, Cranborne-street, for Mr. Henry Ashpoe, Mr. R. A. Leacock, architect, 88, Bishopsgate-street :—  
*Arch.*..... £1,000     J. Allatt..... 100  
*Junkley & Beach*..... 214     Smeaton & Peto..... 218  
*"*..... 273     Crane..... 290  
*Painting*..... 273     Sharp, D'Oyley & Co..... 274  
Electric Glow Company..... 298     Strode & Co. (accepted)..... 298

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor creases and discoloration, characteristic of old paper. The right edge of the page is bound into a dark red or maroon material, which appears to be the inner cover or binding of the book. There is no text or other markings on the page.





# The Builder.

VOL. LXXV. NO. 2899.

AUGUST 27, 1898.

## ILLUSTRATIONS.

House at Wokingham.—Mr. Ernest Newton, architect.....	Double-Page Ink-Photo.
Road Screen, Blisland Church, Cornwall.—Mr. F. C. Eden, architect.....	Double-Page Ink-Photo.
House at Milford.—Mr. Arnold Mitchell, F.R.I.B.A., architect.....	Single-Page Ink-Photo.
Cottages at Rickmansworth.—Mr. Arnold Mitchell, F.R.I.B.A., architect.....	Single-Page Ink-Photo.
"Hill House," Hampstead Heath.—Messrs. Wimperis & Arber, architects.....	Single-Page Photo-Litho.
Design for a Small Country House and Garden.—By Mr. R. Shekleton Balfour.....	Single-Page Photo-Litho.

## Blocks in Text.

Final Figures, Woolpit Church.....	Page 188	House at Wokingham.—Plan.....	Page 192
Stabling, Highcombe Edge, Hindhead.....	" 189	Blisland Church.—Plan.....	" 193
Hill House, Hampstead.—Plans.....			Page 193

## CONTENTS.

Aluminium.....	183	Cottage at Rickmansworth.....	192	General Building News.....	195
The Modern History of London Street Improvements.....	184	Hill House, Hampstead.....	192	Sanitary and Engineering News.....	196
The Designing and Construction of Refuse Destructors.....	185	Design for a Small Country House and Garden.....	192	Stained Glass and Decoration.....	196
Buttress Finials, Woolpit Church.....	188	The Architectural Association.....	193	Foreign.....	196
Competitions.....	188	Scottish Plumbers' Congress in Glasgow.....	193	Miscellaneous.....	197
Stabling, Highcombe Edge, Hindhead.....	189	Engineering Societies.....	194	Capital and Labour.....	197
Congress of the Royal Institute of Public Health.....	189	Books Received.....	194	Legal.....	197
House at Wokingham.....	192	Staining, &c., Riga or Austrian Walnut.....	194	Recent Patents.....	197
New Road Screen, Blisland.....	192	Appointment of Architect, Union Workhouse, Salford.....	194	Some Recent Sales of Property.....	199
House at Milford.....	192	An Old London Mausoleum.....	194	Prices Current.....	199
		The Students' Column: Sound, Light, and Heat.—IX.....	194	Tenders.....	199

## Aluminium.



**ALUMINIUM** has now ranked among the abundant and comparatively low-priced metals of commerce for a period sufficiently lengthy to enable a fair estimate to be made of its value and industrial utility.

Some ten or twelve years ago, when aluminium was being brought prominently to the notice of the British public, many statements of a somewhat startling nature were made concerning it; some even going so far as to foretell the rapid abandonment of iron and steel in favour of the so-called new metal.

Although the prognosticated aluminium age has not yet replaced the age of iron, and the latter element still heads our list of useful metals, the steady increase in the production of aluminium during the last seven or eight years is evidence that the metal has been found of practical value in certain of the arts and industries; and it may safely be predicted that as the use of aluminium becomes more common, fresh fields in which it can with advantage be employed will be discovered, and should its price continue to decrease there is little doubt that copper and brass will frequently be replaced by aluminium.

The literature which has been published upon the subject of aluminium is very voluminous, but of that which has appeared during the present year the most interesting and instructive is to be found in a paper upon "Aluminium and other Electro-Chemical Industries at Foyers," read by Mr. Wallace before the Society of Chemical Industry. This author quotes the results and figures actually obtained at the British Aluminium Works at Foyers, in Scotland, and from these and other statistics the true position of aluminium at the present time among the commercial metals may be seen.

The following table, which shows the quantity of aluminium produced and its price per ton during the last eight years, is con-

clusive evidence as to its commercial utility:—

Year.	Tons per Annum.	Price per Ton.
1890.....	40.....	1,083
1891.....	200.....	504
1892.....	300.....	308
1893.....	530.....	298
1894.....	1,200.....	186
1895.....	1,800.....	160
1896.....	2,000.....	155
1897.....	2,500.....	148

Even at the lowest figure of 148*l.* per ton aluminium appears, at first sight, to be a very expensive metal, but it is so much lighter in weight than any of the other common metals, that if its price is compared bulk for bulk, instead of weight for weight, with other metals, it is found to be cheaper than copper or tin. Thus:—

Metal.	Weight of a cubic foot, lbs.	Approximate price of a cubic foot, <i>l.</i>	Approximate market price per ton, 1898, <i>l.</i>
Aluminium.....	162	10½	148
Copper (cast).....	550	13½	55
Iron.....	450	1	6
Zinc.....	450	4½	23
Lead.....	710	4½	14
Tin.....	456	15	74

It appears that the first aluminium factory was erected in a suburb of Paris as long ago as the year 1856, and that in 1859 Gerhard was selling aluminium made at Battersea at 3*s.* 9*d.* per ounce, so that even as a commercial article aluminium is by no means a "new" metal. It is, however, only during the present decade that aluminium can be said to have entered the ranks of the industrial metals, but taking into consideration the abundance in which its compounds occur in Nature, and the ever-increasing cheapness of electrical energy generated by water-power, it is evident that aluminium is likely to take a prominent position among the metals of the twentieth century.

According to Mr. Wallace, the cost of power at Foyers is, roughly speaking, about 30*s.* per horse-power per annum, exclusive of interest on capital; and Professor Kennedy was quoted as stating that 9*l.* was the lowest cost at which the same horse-power could be produced in Scotland (where coal costs 3*s.* 6*d.* per ton) by means of steam. Assuming these figures to be correct, the saving

effected by utilising water power, instead of steam, for the generation of electrical energy, is so great that steam can no longer be considered as a rival to water power for this purpose.

Several processes have been employed for the manufacture of aluminium, but in this country all have been abandoned save the process owned and worked by the British Aluminium Company. By this process aluminium is obtained by subjecting aluminium oxide to electrolysis in a bath of molten cryolite, and as the oxide becomes reduced, more oxide passes into the bath, and thus the process is carried on continuously. It is stated that the temperature of the bath lies between 750 deg. C. and 850 deg. C., and that a tension of from three to five volts is sufficient to maintain the necessary temperature as well as to effect electrolysis. The oxide is prepared from Irish bauxite, an impure hydrated oxide of aluminium, extensive deposits of which are found in the County of Antrim.

At present aluminium owes its popularity mainly to its being so much lighter than the other metals of commerce; for portable appliances it is especially valuable, and has already proved serviceable in the equipment of regiments, in the manufacture of cycles and carriages, and in the manufacture of appliances for travelling photographers. It should also benefit the field surveyor and his staff by materially reducing the weight of most of the surveying instruments and appliances. Although a white metal, aluminium is not, like silver, blackened by exposure to air containing sulphuretted hydrogen; nor does it corrode like brass, or rust like iron.

It is attacked readily by hydrochloric acid and alkalis; but water, moist or dry air, nitric acid, and most of the organic acids do not attack it to any appreciable extent. If, by mischance, small quantities of it are absorbed into the system owing to the aluminium having found its way, as a soluble salt, into food substances, it does not, like copper or lead, act as a poison. For surgical instruments, boiling pans, and storage vessels it has already been used with advantage, and from the results obtained by numerous experimentalists it appears probable that it will in the future play an important part in

the manufacture of steel and of various alloys.

The future of aluminium must largely depend upon its price as compared with other metals, but even at its present price it is undoubtedly a metal of great industrial importance, and although it lacks many of the most useful properties of some of its competitors, and is far from possessing all the merits that some of its too zealous patrons have claimed for it, yet it is well worthy of the careful attention and study of all who manufacture, supply, or utilise common metals for industrial purposes.

#### THE MODERN HISTORY OF LONDON STREET IMPROVEMENTS.

**T**HE change in the character of a modern city is of such a piecemeal and gradual character, that the full extent of what has occurred during a series of years is somewhat difficult to realise. People forget what has been accomplished, and, looking at a city as it exists, they complain of its inconveniences and of the want of vigour in regard to improvements. We think that if a citizen of London will look at Mr. Percy Edwards' "History of London Street Improvements, 1855 to 1897,"\* he will be surprised at what has been done. It is, in fact, a history, in part, of London during the last half of the present century. "It is sought," says the author in his introduction, "to give a description of the London street improvements undertaken by the Metropolitan Board of Works, from the time it was called into existence in 1855, to March, 1889, when it was superseded by the London County Council, from April, 1889, to December, 1897." Before the Metropolitan Board of Works came into existence, the state of affairs may best be described as being one of promise, but not of performance. Nor does anything better exemplify the uselessness of investigation and reports alone, than the state of London at the middle of the century. In 1830 a Select Committee made various recommendations as to new streets, and it showed conclusively the necessity for them. Again, "between 1832 and 1857 the necessity of street improvement in London was so fully recognised by Parliament that during that time some eleven or twelve Select Committees were appointed to take into consideration plans for the improvement of the Metropolis, and to advise as to the best means of carrying out improvements. . . . As a result many large improvements were brought before Parliament. . . . Very few schemes, however, were actually undertaken, principally owing to the difficulty of obtaining a convenient source of revenue from which to pay the cost of the works." It is obvious, therefore, that we must date the commencement of street improvements in London from the creation of the Metropolitan Board of Works. Before that event they were practically at a standstill. There was much talk but next to no action.

Towards the end of its existence the Metropolitan Board of Works had sadly lost the public confidence; but there can be no doubt that it has left a permanent and useful mark on the history of the Metropolis. If it had done nothing else but construct

the Victoria Embankment—a thoroughfare which as years go on will be more and more appreciated—it would have deserved well of London. During the whole time that it existed, from 1857 to 1889, "there was not a time at which the Board had not in hand extensive works intended to provide new and improved means of access from one part of the town to another. Every district participated in the benefit; every locality showed by one or more new or widened thoroughfares where the hand of the Board had been at work." Nor was the task in some senses an easy one, since the powers of the Board were, so far as regards the existing Acts of Parliament, so limited that in nearly every instance where an important street improvement was to be undertaken application had to be made to Parliament for a special Act.

Improvements of any kind require money. Nothing, indeed, is more remarkable than the way in which inhabitants of a town or a local district will complain of the state of the place, and yet in the same breath will depreciate the expenditure of money on public improvements. Some persons think that the Metropolitan Board of Works might have done more than they did. Yet they spent during their existence over fifteen millions, which, by recoupment from the sale of surplus land, was reduced to ten millions. During the first part of its existence there is no doubt that the Board was hampered in a financial sense. It was not until the Loans Act, 1869, was passed that it was able to obtain large sums of money at a reasonable rate of interest. The essentials of that statute were that the cost of the improvements undertaken by the Board should be spread over a period of sixty years; that it should be raised by the creation of a stock called the Metropolitan Consolidated Stock; and that there should be one rate for all the Board's expenditure. Previous to this legislation, the Board had been obliged to borrow from insurance companies at a rate as high as 4½ per cent. Thus it is evident that what may be called systematic municipal finance, without which any extensive improvements were impossible, was growing during the period of the Board's life. "As soon as the Board was authorised, under the Act of 1869, to create a Metropolitan Consolidated Stock, it became able to raise on its own security all the money it required at about the same rate of interest as that on which loans had been obtained from the Bank of England under the Treasury guarantee. Nor in this connexion should the large assistance obtained from the Coal and Wine duties be overlooked. For a great number of years they had been the means by which London improvements were largely paid for." Such works as the rebuilding of St. Paul's Cathedral and other City churches after the great Fire of London, the building of the first Blackfriars Bridge, the freeing of old London Bridge from toll, the making of the approaches to the new bridge, the formation of Cannon-street, &c., were effected from this source. After 1861 part of these duties were allocated to the Metropolitan Board for special purposes, more especially for the construction of the Thames Embankment. They, however, were not regarded with favour, either by Liberal or Conservative members, and so in process of time they were allowed to expire, thus putting an end to a useful revenue, which seems to have

been raised without disadvantage to the general public.

As regards what was done, as we have already said, the Thames Embankments are the great memorials of the Metropolitan Board of Works, and to these may be added Queen Victoria-street. Any number of details might be given of other works, the aggregate of which has caused a vast improvement in the Metropolis. Such a work, for example, as that of a new direct street from Commercial-road East to Whitechapel High-street, which was effected in 1869, was of the first public importance. The street was 1,200 ft. long and 70 ft. wide. "The new thoroughfare afforded access to the City for a very important class of traffic, and formed a direct line of communication from the City to the docks." It practically brought that fine thoroughfare, Commercial-road East, into the City.

In 1888 the London County Council came into being. That body has been in existence for ten years, and it has not yet really effected any great improvement. There has been an immense amount of academic discussion: a great deal of cry and very little wool, to use a homely saying. But London is still waiting for its new streets. Here and there small improvements have been made, chiefly in conjunction with the Local Authorities. The Embankment from Westminster to Blackfriars was opened in 1870, just about fifteen years after the Metropolitan Board came into existence. Many other useful works had been effected in the meantime. When these results are compared with what has been done by the County Council, it must be admitted that the existing governing body of London has been a failure in regard to Metropolitan improvement.

In this connexion it should also be borne in mind that when the County Council came into office it took over, so to say, "thirteen projected improvements in respect of which the Metropolitan Board had deposited a Bill in Parliament." Of these, which have now been completed the cost has been 332,000*l.*, whilst the actual or estimated cost of the improvements initiated by the Council and already completed or in progress is 1,984,000*l.* Among these works in progress is the widening of the Strand, by the destruction of the Holywell-street block of buildings, but to the observer this particular improvement appears still to be waiting a beginning.

#### NOTES.

The Paris Exhibition.

THE General Committee for the 1900 Exhibition has drawn up a first list of the artists who are to be invited to undertake the sculpture and other decoration of the Alexandre III. bridge and the palace in the Champs Elysées. M. Frémiet is to execute two of the groups of Pegasus and Fame which are to crown the large pylons at the main entrance, and M. Steiner and M. Granet are to execute the two others for the pylons at the opposite side. Before each of these pylons is to be a large decorative figure; these are to be executed by Messrs. Marqueste, Coutan, Gustave Michel, and Lenoir. M. Dalou and M. Gardet are to sculpture four lions accompanied by figures of children or geni, in face of the entrance to the new bridge, the balustrade of which will carry two figures in bronze, by M. Massoule and M. Léopold Morice. M. Gauquié has been commissioned to carry out the groups of children

\* "History of London Street Improvements, 1855-1897." By Percy J. Edwards, Clerk of the Improvement Committee. Printed for the London County Council.



dren in bronze which will surround the large lamp standards at each side of the bridge. In regard to the Champs Elysées palace M. Joseph Blanc has been commissioned to paint the cartoons for a decorative frieze to ornament part of the large palace, and which is to be carried out in bas-relief by MM. Sicard, Fagel, and Baralis. Lastly, M. Récipon has been commissioned to execute the quadriga groups which will surmount the angle pavilions of the large palace, on the façade towards the new avenue.

An Example of late Greek Sculpture.  
In the last issue of the *Gazette des Beaux Arts* (August, 1898, p. 107) M. Solomon Reinach publishes an interesting marble group now in the museum at Sofia. This museum, under the active and intelligent directorship of M. Dobinsky, is rapidly rising into eminence, and promises to be a good third to those of Constantinople and Athens. The group in question was found on the site of the ancient Odessos, not far from Tomi, the scene of the exile of Ovid. The place was a colony of the Milesians, founded in the sixth century B.C. The group of two figures, 0.43 m. in height, represents, according to M. Reinach, Aphrodite and Adonis. This conclusion he is led to by a study of analogous groups in inscribed Etruscan mirrors. Its special interest lies in the fact that its style is closely analogous to that of a familiar group of ancient monuments known as Neo-Attic, and associated with the names Stephanos and Menelaos. This Neo-Attic style prevailed at the end of the second, and beginning of the first century B.C., and is a kind of late repetition of the manner of Praxiteles; its characteristics are a peculiar openness of the ocular cavity, attenuation of the relief of eyelids and eyebrows, and a general dreamy languor of expression.

The Drummond Chapel, Innerpeffrey.  
This ancient chapel, which since the thirteenth century has been the burial-place of several members of a distinguished Scotch family, has, together with its monuments, been recently repaired at the charges of Lord Ancaster (of the neighbouring Drummond Castle), Viscount Strathallan, and Captain Drummond, of Cromlix. It is situated on a bank of the Earn, between Strathallan Castle and Inchaffray Abbey, Perthshire, being about three miles distant from the latter. Inchaffray—signifying the island of masses—was founded for canons regular from Scone, in 1198, by Gilbert, Earl of Strathearn, and Mathilda, his wife, with a dedication to St. John\*. As the name implies, it was once surrounded by water. David, second Lord Drummond, bought it from the Abbot, Alexander Gordon, Bishop of Galloway, for his second son James, afterwards Lord Madderty (Mater Dei), and ancestor of the Viscounts Strathallan. The river or canal ordered by the last Parliament of Scotland to be cut for draining the low grounds around the abbey was named Powaffray, and the word "Inner" prefixed, meaning the junction of the waters, forming Innerpaffray, gave a name to Lord Madderty's residence, where the Pow falls into the Earn. By his wife Jean he got the lands of Innerpeffrey. The Abbey

stands on the banks of Powaffray water, in Madderty parish. In Part VII. of "Drummond's British Families" (1845) will be found a view of the ruins, with four illustrations of the seal. Madderty is a corruption of "Mater Dei," the parish church being dedicated to Mary the Virgin.

A CORRESPONDENT in Edinburgh writes to us to say that the name of Mr. "C. H. Wilson," referred to several times in the article on "Glasgow Architecture" in our issue of July 9, as the deceased architect of certain buildings, should have been "C. Wilson." The correction, we are informed, is important, as there was also a Glasgow architect named C. H. Wilson, who was not however the architect of the buildings referred to. We presume that our correspondent is correctly informed; at all events we give his correction. It is extremely difficult, as we have found over and over again, to get accurate information as to the spelling or initials of the names of deceased architects of any city, even from inhabitants of the same place. As an instance, we may mention that when making up our article on the architecture of Aberdeen, our representative was most positively informed, by an Aberdeen architect, that the architect of the West Church was "Gibb," the name of so renowned an architect as Gibbs being thus incorrectly given in his native town. In this case the name was too well known for the mistake to pass; but in the case of names of only local celebrity it is almost impossible to guard against inaccuracies of this kind.

Dundee Institute of Architects.  
The full title of the Dundee Institute, as given on the title-page of their annual Report, which has just reached us, is "Institute of Architecture, Science, and Art," the title being probably chosen with the view of extending the numbers and influence of the Institute farther than could be done by the architects alone in a not very large city. It does not appear, however, that the most has been made of this extension of scope, since on the first page we read that "of the twenty-four Lady Associates elected in November 1891, only six remain on the roll, probably because so little has been attempted to be done by way of enlisting their practical sympathy and aid." This is to be regretted; but the general tone of the Report gives a favourable idea of the activity and energy of the Institute; the address of the President (Mr. T. M. Cappon) at the Conversazione, which is printed in the Report, is a very good one; and the articles describing the visits made to places of interest, accompanied by some illustrations, are exceedingly interesting and well written.

Horsham Cemetery Chapel Competition.  
The *West Sussex County Times* of the 20th contains a brief report of the curiously naïve manner in which the Horsham Burial District Committee endeavoured to obtain competition designs for two cemetery chapels and a lodge. They wrote to three architects, Mr. Buck, Mr. Burston, and Mr. Wheeler, asking for designs for the buildings named, without apparently giving any particulars or even naming the sum to be expended. Mr. Buck wrote asking whether any independent person would be engaged to adjudicate on the designs, what was the sum to be ex-

pended, and whether the plans would be sent in under cover of a motto. He was informed that the designs would be judged by the Committee, with the names of the architects attached, and that the Committee left the sum to be expended to the discretion of the architects! He, very properly, declined to compete under these conditions. Both the other architects asked for further particulars, and Mr. Wheeler for an extension of time, as he did not think it possible to prepare a well-matured design in the time named. After some discussion the Committee adhered to their original position, but granted Mr. Wheeler the further time he asked for. Under these conditions it appears that the other two architects are prepared to compete.

THE annual Report of Dr. King Sanitary State of Warr, the Medical Officer of Health for the Hackney District, touches on a good many sanitary evils prevalent in the district, but especially on the old and long-standing grievance of the condition of the River Lea, which seems to be "nothing bettered, but rather grows worse." Into the part of the river bordering on the recreation ground known as Hackney Marshes, the combined effluents from the Walthamstow Sewage Farm and the Leyton Sewage Works are poured, rendering the river so polluted as to form, in immediate contiguity to a much-frequented open space, an undoubted danger to public health. The remedy, the Report urges, is to be found in a main drainage scheme for the Lea Valley—a scheme outlined in the Report of the Select Committee in 1886, and, as Dr. Warr observes, "if necessary then, how much more so now." A great deal of inconvenience has been experienced in Hackney, during the past year, from storm floodings; and the Medical Officer has in previous Reports, it appears, referred to the small amount of fall in the sewers in some parts of the district, and the need of better provision for carrying-off storm water.

FOR an enlargement of their No. 41, Mount Pleasant, Clerkenwell. Weights and Measures Testing Offices the London County Council have acquired two houses at the west end of Warner-street, numbered 41-3, Mount Pleasant, and their site is now being cleared. Of the two houses No. 41 was much earlier in date than the other. On its front it bears two red brick tablets—the lower tablet of simple design and inscribed "Baynes Street, 1737." The upper tablet is level with the second-floor windows and forms an ornamental piece of fashioned brickwork. Beneath a pointed hood or pediment is a T-shaped panel, within which are cut, in relief, the letters and date "I N P, 1737," and what we take to be the crest of an arm holding a hoop or ring beneath a waved scroll, and the motto, "In God is all our trust;" on either side of the panel are moulded two curled scrolls. The name "Baynes-street" is noteworthy, for the houses now collectively known as "Mount Pleasant" had formerly four names; the block between Laystall and Warner-streets (beneath which ran the Fleet) was Dorington-street, distinguished by the tablet with date "1720" on the front wall of Nos. 55-7; the block between Warner-street and Coldbath-square, opposite the (old) prison, was Baynes-row; next eastwards were

\* The seal, of which two impressions are extant, bears on the obverse and reverse the inscription, "S' Comune Eccle Scti Johis Evangeliste de Insula Missarum."



Coldbath-square, and Cobham-row. Little Baynes-row lay behind Nos. 1-4. Coldbath-square, and extended from Baynes-court into Bath-court. The construction of Rosebery-avenue has greatly altered these features of the district. Coldbath-square originally consisted of the two rows of houses, facing outwards, which stood nearly north and south; in the inner space—once known as Sir John Oldcastle's field—rose the chalybeate spring, whose specific virtues were discovered in 1697 by Mr. Walter Baynes of the Middle Temple, owner of the property we describe. Cobham-row, which had a line of chestnut trees along the pavement, marked the site of the house of Sir John Oldcastle, Lord Cobham, who was burnt in 1418 at St. Giles-in-the-Fields, as the leader of the Lollards.

St. Mary-the-Virgin, Charing-Cross-road.

A NOTICE, in pursuance of the London Building Act, 1894, has been served for the demolition of the south and west walls of this church, which represents all that remains of the old Greek church in Soho. The last service was celebrated on Sunday, 7th instant. It was the first Greek church erected in England, and was built of red brick (in the then Hog-lane, afterwards Crown-street), in 1677, by Joseph Georgeirenes, Archbishop of Samos, who had sought refuge in London from the Turks. A Greek inscription over the west door records that Charles II., the Duke of York, and Henry Compton, Bishop of London, helped in the work. It subsequently belonged to a Huguenot congregation, by name of "Les Grecs," during 140 years, from whom the Calvinistic Baptists acquired the lease. In 1850 Bishop Blomfield saved the fabric from conversion into a music hall and dancing saloon, and it received its present dedication. The adjoining clergy house was built in 1862; about eleven years later the church was lengthened eastwards, after the designs of Messrs. W. Slater and the late R. H. Carpenter—a new north aisle has since been added. Some almshouses formerly surrounded the Greek Church; they represented six separate endowments, 1680-6; the north, west, and south blocks were removed for the erection of Board Schools, and the School Board Laundry and Cookery Centre (1892). The church is depicted, but appears as reversed, in Hogarth's print of "Noon."

"Bertolini's," St. Martin's-street, Leicester-square.

SOME houses on the east side of this street have recently been dismantled. Of one of them, at the corner of Orange-street, the ground floor alone remains. Though commonly neglected in the London guide-books, it was a famous house in its day, being a hotel and coffee-house kept latterly by Mme. Bertolini, and a favourite resort of men of letters, actors, and musicians in the earlier half of the current century. The house, No. 34, afterwards "Foot's American Restaurant," is sometimes described as that which was occupied by Sir Isaac Newton, and the Burney family, whom Mrs. Thrale called her "dear Newtonians." But Newton's house, No. 35, still stands, partly untenanted, in St. Martin's-street, between Long's-court and the Orange-street Congregational church. It was lately occupied by the Warrant Officers' Club. The adjacent ground, and the sites of Nos. 4 and 5, Long's-court, 34 and 35, Leicester-square, and 23,

Green-street, have been cleared for the proposed new buildings of the Dental Hospital of London.

The "Art-Union" Engraving.

THE large engraving which the Council of the Art-Union of London annually present to their subscribers is, this year, a reproduction of Mr. Briton Riviere's picture of a saintly knight on a frightened horse preparing to descend into a dark and presumably haunted forest, with the words "In Manus Tuas, Domine" as a title; a work which was exhibited at the Royal Academy in 1879. The reproduction is an etching from the capable hands of Mr. C. O. Murray, but in that highly worked and finished style which may more properly be called engraving with the etching-needle than etching in the artistic sense of the word. It is a conscientious and forcible rendering, on an unnecessarily large scale, of a picture which, like most of the Art-Union presentation subjects, has that kind of easily apprehended meaning which appeals to the general taste of the middle-classes of this country, who value a picture more for its moral than its artistic quality.

#### THE DESIGNING AND CONSTRUCTION OF REFUSE DESTRUCTORS.\*

IN the design and construction of a successful and economical refuse destructor plant the following are the principal points which must be borne in mind:—

A. It must never be forgotten that the primary object of a refuse destructor is, as its name implies, to destroy refuse, and to destroy that refuse as completely as possible and without the production of any description of nuisance. By the term to destroy refuse in this connexion is implied a practically absolute chemical separation of the combustible portions of the refuse (such as the carbon, phosphates, and nitrates which are found in cinders and the animal and vegetable matter) from the non-combustible portions (which are chiefly mineral), and includes the complete oxidation of the former class and the fusion and agglomeration so far as is possible into hard clinker of the latter parts. It must be regretfully admitted that in a very large number of destructors these important objects are only attained to a very limited extent.

In order to ensure a perfect result:—

(1) A high temperature must be attained; 1,300 deg. Fahrenheit is admissible, but 1,600 deg. to 1,800 deg. Fahrenheit is better. It is not sufficient to impart the desired temperature to the furnace gases after they leave the furnaces. Such devices as Mr. Jones's Patent Fume Cremator (intended for this purpose) have done good service in their day in preventing the abominable emanations from the chimneys of old-fashioned low temperature destructors, but at the best such a device as a fume cremator is only useful in securing perfect oxidation of the gases and vapours distilled from the refuse, while giving no assistance whatever towards completing the other and equally necessary part of the process, namely, the reduction to innocuous clinker of the solid refuse itself. For this purpose it is essential that a high temperature must be kept up in the furnace itself as well as in the flue.

(2) Having provided means for securing a high temperature in the furnaces and the flues, such arrangements must be made as will secure that the whole of the refuse and the whole of the products of combustion or distillation must be subjected to this high temperature, in presence of sufficient air, and for a sufficient length of time to insure complete oxidation of all combustible substances.

(3) It is also necessary that the products of combustion passing up the chimney must be as free as possible from solid matters, such as dust, which, although they may be so perfectly burnt as to be free from any taint of putrefaction, yet their mechanical effect upon the

leaves of trees and plants, upon the lungs of persons and animals, and upon clothing and furniture, are such as to become an intolerable nuisance, and a nuisance which has been proved in more than one instance to be actionable at law.

B. The destructor must be so designed as to involve the least possible expense in its working. To this end the handling of the refuse should be reduced as much as possible though it must be borne in mind that the adoption of cumbrous and complicated mechanical feeding arrangements has hitherto been found to give no relief in the matter of labour; in fact, it has even involved additional labour, while at the same time such machinery is frequently very costly both in construction and in upkeep and working charges. It must always be borne in mind that machinery working in the presence of large quantities of dusty and dirty material deteriorates very rapidly, and any machinery which is required about a destructor, particularly electrical machinery, must be so arranged as to be nearly as possible boxed in and protected from dust. The author would mention as an instance the Shoreditch combined electrical lighting and destructor plant, where a large proportion of the total current produced appears to have been used on the works in driving fans, lifting machinery, &c. The author believes that this excessive expenditure of energy is due in a large measure to the extra resistance caused by the impossibility of keeping switches, brushes, &c., in proper order in presence of dust and dirt. In order to ensure economy, the safest points to bear in mind are that the refuse should be brought in the collecting carts as near as possible to the charging holes of the furnaces, and the tipping arrangements should be such that a minimum of work is involved in properly charging the furnaces. It must also be remembered that considerable judgment is required in working a fire, and that judgment is not usually a faculty possessed by machinery. In order to obviate any difficulty in separating clinker from unburnt matter, and in order to insure as nearly as possible a continuous process in the furnaces, they should be fed at one end of the grate and clinkered at the other, and the arrangements at the clinkering end should again be such as to involve the least possible labour in removing the clinker and to avoid altogether the necessity for breaking it up in order to get it through small openings.

C. In these days people are not content with getting rid of the refuse in an inoffensive manner. It has been demonstrated that large quantities of heat are available from the combustion of refuse, and therefore it has become necessary that this heat should be utilised, and at present almost the only practicable method of utilising the heat is in the evaporation of water. When it has been shown that in practical use eight tons of refuse will raise as much steam as one ton of good coal burnt under good conditions, and that it will raise that steam to the highest working pressures ordinarily adopted, there can be no doubt as to the advisability of providing sufficient boiler room and arranging a suitable use for the available power. In order to secure the best results the boilers must be placed near enough to the cells to prevent any important loss of heat by radiation, but they must not be placed near enough to interfere with perfect combustion of the gases, which is generally not completed until after they have left the furnaces and traversed a certain length of flue to insure proper mixing. It must be borne in mind that even in boiler firing with coal any contact of the gases with comparatively cool cross tubes, &c., before they are perfectly oxidised, will check the combustion and cause smoke, and it is obviously useless to mix any further oxygen with such unburnt gases after they have dropped below their natural temperature of combustion or "flashing point." It may here be mentioned that water-tube boilers are the most readily adapted to the requirements of a destructor station, although very good results have been obtained with other types, particularly Lancashire boilers. The comparative safety of water-tube boilers from explosion, and their general handiness and convenience, render them particularly adapted for working where the labour employed is not of a highly cultivated order, and generally in connexion with these plants it is best to remember that whatever apparatus is provided will probably have to be worked by stokers.

D. The solid matters resulting from the

\* A paper read by Mr. F. L. Watson, Assoc. M. Inst. C.E., on the 19th inst., at the Dublin Congress of the Royal Institute of Public Health (Engineering and Building Construction Section).



combustion of the refuse, e.g., clinkers, from off the grates, and fine ashes from underneath them, must be made use of for two reasons. First, if they are not made use of, they must be carted away and tipped to waste at a further cost. Second, they may be made a valuable source of revenue. It must not be forgotten that we have here another powerful argument in favour of high temperature destructors, the clinker from which will be completely fused, and will contain no combustible or putrescible matter, and will therefore be of a hard and sharp nature in contradistinction to the clinker from low temperature destructors, which is soft, friable, and totally useless, and frequently even putrescible. It is no uncommon thing for even half-burnt clinker to take fire again after being tipped into a heap, and thus to occasion serious nuisance. Assuming, however, that the clinker is going to be of a hard and useful character, we shall require machines for breaking it up, grinding it, and mixing it with lime, &c., to form mortar, and these machines must be powerful, massive, and durable. Having thus briefly sketched the requirements of a destructor plant, the author will proceed to give some details of the manner in which these objects have been attained in one or two plants in the design and construction of which he has been concerned.

This purpose will perhaps be best served by a brief description of the plants in question. 1. *The Powderhall Destructor, Edinburgh.*—This is a 10-cell plant. It was originally of the Fryer type, having been constructed in the year 1893. The working of the destructor, however, gave rise to serious complaints from the neighbours, culminating in an action for nuisance by the proprietors of the neighbouring estate of Redbraes, on which were situated some nursery gardens. It was held by the High Court at Edinburgh that a serious nuisance had been established, and the Corporation were condemned in damages and costs. The costs, owing to the very large number of expert witnesses called on both sides, were extremely heavy. The Court appointed Mr. Benjamin Hall Blyth, the eminent civil engineer of Edinburgh and Westminster, to confer with Professor William Odling, of Oxford, and to report to the Court as to the practicability of remodelling the destructor in order to prevent a recurrence of the nuisance. Mr. Blyth inspected the most important destructors in England, and his report to the Court was to the effect that if the type of destructor in use at Oldham and at Leeds were adopted the nuisance would be abated. Thereupon the author's firm made an offer to the Corporation to take upon their shoulders the whole responsibility of the alteration, and to guarantee that all the causes of complaint should be removed. A formal contract was entered into, Mr. Hall Blyth being retained as referee, and the contractors bound themselves to fulfil all their obligations to his entire satisfaction. It so happened that the grates of the old furnace were of practically the same dimensions as those of the Horsfall Standard Cell and therefore the furnaces were only pulled down to the level of the grate bars, the foundations and asphalt walling being left in place. After the heavy expenses to which the Corporation had already been put, there was a natural desire to economise as far as possible in the alterations, and therefore some of the old ironwork, including the clinkering doors, was made to do duty over again. These clinkering doors are of a somewhat awkward pattern. They swing upwards on hinges, and are provided with balance weights, working into recesses in the furnace fronts. The hinges give a good deal of trouble from sticking, and although the doors have the advantage of providing an opening right across the grate for the removal of clinker, they have the great disadvantage that the amount of opening is fixed—that is to say, they must be either wide open or shut, and when they are wide open the hot gases heat at the back of the door reflects great heat on to the arms, hands, and faces of the workmen. With the exception of these and some other minor details, the furnaces are reconstructed after the Horsfall standard pattern. They are built in a double row back to back, five cells on each side. Each pair of cells communicate at the back with a feed hole 2 ft. square common to the pair of cells. The feed-hole has a flat table at the bottom, and the refuse is pushed over the edge of this table by means of a three-pronged fork. It falls down on to the sloping dry hearth of the furnace. The sides of the furnace flare out side-

ways from the feeding end down to the grate, so that when the refuse is once pushed over the edge of the table at the bottom of the feed-hole it cannot possibly stick. In this manner somewhere about a cubic yard of refuse is fed in at one operation on to the drying hearth. The operation of feeding takes place a few minutes after the operation of clinkering, the red fire on the grate being given a short period to brighten up under the action of the blast before the fresh refuse is drawn on. The stoker on the clinkering floor pulls the refuse forward from the drying hearth on to the grate bars, and spreads it evenly over the grate. It should be mentioned that the drying hearth is paved with fire-brick, and is kept hot by being in close proximity to the main flue. It is found that 6 ft. is the maximum length of grate which can be conveniently worked by the men. It is also found that making the grates 5 ft. wide insures the handiest and most economical disposition of the labour, therefore each grate is 5 ft. wide by 6 ft. long, or 30 square ft. in area. The grate bars in the Edinburgh destructor are of wrought iron, rivetted together in slabs of four. Each bar is of a tapered section, half an inch thick at the top and three-sixteenths at the bottom edge. The distance pieces or washers between the bars are cut from the bars themselves and inverted, so that the air space between the bars is three-sixteenths of an inch wide. They are made in 6 ft. lengths. There is thus no joint in the middle of the grate for the firing tools to get caught in. Each furnace is provided with hollow cast-iron sides, having removable plates next to the fire. The air from the forced draught apparatus is introduced into these boxes, which communicate for that purpose, with a blast flue common to each row of cells. The boxes are closed above the grate. They communicate with the ashpit by openings controlled by valves. The valves are operated by handles placed below the clinkering door. These side boxes serve a double purpose—first, the air is heated, and second, the brickwork of the furnaces is protected from the erosive action of the clinker, which in ordinary brick-lined furnaces adheres to the brickwork and brings away small particles of the same at every time of clinkering, so that the furnace sides become rapidly eaten away. Ordinary iron plates will not stand the heat, but this difficulty is completely avoided by the side box arrangement alluded to. The blast flues are placed one on each side of the main flue, so that any heat which is given up by conduction from the sides of the main flue is communicated to the air and finds its way back to the furnaces to assist in promoting rapid combustion. Each blast flue communicates at its outer end with a vertical flue, in which is placed the forced draught apparatus. This consists of a large steam jet blower of an improved and patented design, a row of adjustable flat steam jets being placed so as to introduce a powerful current of air in a cast-iron trumpet, also of a flat shape. The use of these steam jets saves a good deal of expense and trouble in keeping an engine and fan in running order, and they require no skill and attention, besides which the steam is of considerable assistance in raising the temperature in the cells. The flues are arranged according to Horsfall's well-known patent. The whole of the products of combustion pass out of the furnaces at the front end through openings in the arch immediately above the clinkering door. It will thus be observed that the gases pass away at the clinkering or hot end of the furnaces, in contradistinction to the Fryer destructor, in which the gases pass away at the feeding or cold end of the furnaces. The front flue arrangement insures that any vapours given off by the green refuse in drying shall be mixed with the hot flames from the blazing refuse, and the furnace crown and cross flues are thus raised to a red or white heat, the bricks retaining their high temperature even after the fires are freshly charged, and thus ensuring that at all times and in all states of the fires the gases are perfectly consumed. The cross flues run back over the top of the cell, the two flues from each pair of cells meeting at a point over the centre of the main flue and communicating therewith by a vertical passage. On looking into the main flue of one of these destructors, bright blue flames can always be seen descending through these passages. In order to be visible at that point the flame must be at least 25 ft. long, and persons who are familiar with furnace work will realise that the production of a bright flame 25 ft. long from

ordinary house refuse, mixed with decaying fish and other matter of the most abominable description, is no mean achievement. It is found that when a considerable number, say six cells or more, are combined in one block, the mixing of the gases from the various furnaces insures a very steady and very high temperature in the main flue, and it is therefore always found advisable to construct the furnaces in blocks in this manner rather than to divide them up and put boilers between them. At Edinburgh the main flue communicates immediately with a large dust-depositing chamber, circular in form and of somewhat peculiar construction. This chamber is shown upon the diagram. The gases pass first into the outer cavity, swing round this, enter the inner cavity or well at the top, and leave it at the bottom. Various baffles are provided in the outer cavity. The swirling action thus produced causes any small quantity of dust which the gases may contain to be deposited within this chamber. The exigencies of space were the cause of the dust-catcher being placed between the cells and the boiler, which doubtless causes some loss of heat. The boiler is the original boiler belonging to the old destructor. It is of the multitubular type, and is not nearly large enough to use the whole of the heat from the cells. It, however, produces steam for forced draught apparatus and for driving a mortar-mill and an electric light plant, which provides light for the destructor-house and a range of stables and superintendent's house belonging to the cleansing department.

The effect of the alterations carried out by the author's firm was that all causes of complaint were entirely removed to the satisfaction of the referee.

The tipping arrangements are as originally designed. There is a tipping-floor on each side of the row of cells, and the refuse is tipped from the carts on to the furnace top in close proximity to the feed-holes. To prevent stewing of the refuse on top of the cells, the charging-floor is honeycombed with drain pipes, communicating with the forced draught apparatus, whereby fresh air is continually drawn through the pipes.

We may now proceed to a brief description of the 12-cell destructor at Hammerton-street, Bradford. In this case, as in the case last described, there was originally a Fryer destructor. It had, however, been fitted some years ago with Horsfall's forced draught apparatus, and it worked with fair success until it was considered by the Corporation to be worn out. The contract for re-constructing the furnaces was then entrusted to the author's firm. The destructor consisted of two blocks of six cells each, with a pair of multitubular boilers and a chimney between the two blocks. Each block of cells has a passage through one boiler and an alternative passage direct to the chimney. These cells were ordered by the Corporation to be completely removed to the ground level, and the new cells were constructed entirely with new material and according to improved designs prepared under the immediate supervision of the author. The flues are arranged exactly as described in the case of the Edinburgh destructor, the dimensions of the cross flues being slightly enlarged in the light of more recent experience. The dimensions of the charging holes and feeding table were also slightly altered for the same reasons, in order to insure a greater facility in charging. Observations having been made with regard to parts of the old destructor which had failed after years of service, the new one was constructed with much heavier end walls and with far more massive stays. It is tied together by means of heavy rolled steel joists 8 in. by 4 in., and tie-rods  $\frac{1}{2}$  in. diameter, swelled to  $\frac{3}{4}$  in. to receive the nuts, and there are two steel channels, 12 in. by 3 in., running the whole length of the block of cells over each furnace front. It was found that the ordinary cast-iron washer blocks through which the tie-rods pass, and which hold the channels in position were liable to give way under expansion of the furnaces. Cast steel washer blocks were therefore substituted, and very heavy spring steel washers were placed under the nuts in order to allow a certain limited freedom of movement. These improvements have been quite effectual. The side boxes were also improved by placing the controlling valves in the neck of the boxes and cutting off the supply of air at the point of junction with the blast flue, the openings from the side boxes in the asphalt being always left



open. The blast is controlled by large swinging valves placed in cast iron boxes built into the arch of the blast flue and bolted up to the side boxes. The movable plates which close the front of the boxes are of an improved pattern held in place with spring wedges, and after nearly twelve months of continuous hard work not one of these plates has shown the smallest sign of either burning or cracking. The clinking doors are also of an improved design. They are constructed similarly to the doors usually employed on plate furnaces, being hollow castings with a space at the back, which is filled up with fire bricks. The door is balanced by a solid cast balance weight provided with a handle, and is suspended by a wire rope passing over two pulleys. Although the door weighs 5 cwt. and the balance weight the same, there is not the slightest difficulty in opening or closing it with one hand. The ash-pit doors and flue doors are very carefully designed and fitted up, the faces of the doors and frames being planed and the pin holes drilled with the door in position, thus insuring a perfectly close fit. They are held by lever catches working on wedged-shaped faces. The boilers belonging to this plant were not disturbed, and they are, like the Edinburgh boilers, of the multitubular type, and not half large enough to take up the whole of the heat. They supply steam, however, for the forced draught apparatus, which is of the same pattern as at Edinburgh, for a large quantity of clinker-grinding and mortar-mixing machinery, for the electric lighting of the works, and manager's house and office, and for certain fish-drying pans belonging to a private enterprise. The Corporation contemplate putting down more boilers and machinery to utilise the heat from the destructor. The results of the building of the new cells have been as follows:—The capacity of the destructor, which was formerly  $7\frac{1}{2}$  tons per cell per twenty-four hours, has been increased up to 10 tons per cell per twenty-four hours, and since the men have been used to the cells a further increase up to 11 tons has taken place. This is without any increase in the number of men employed. The cost of labour has been reduced from  $7\frac{1}{2}$ d. to 8d. per ton under the old system to just over 5d. under the new system. This is by several pence the lowest authenticated cost of labour in the world. The temperature in the cells and flues has been very largely increased and the smoke from the chimney has been reduced to an absolutely inappreciable quantity; in fact, it requires a remarkably clear state of the atmosphere to be able to distinguish anything from the chimney top at all, although no dust-catcher is in use and the chimney is quite close to the cells. At Hamerton-street an ingenious arrangement of overhead railway, carrying a swinging truck, into which the clinkers are pulled direct from the furnaces, has been applied to both of the blocks of cells. This is the invention of Mr. Cox, the city engineer, and Mr. McTaggart, the superintendent of the cleansing department. Improved machinery for dealing with the clinker has also been introduced, and it is a fact that since the new cells were got to work there has not been the slightest difficulty in disposing of every ounce of clinker, fine ash, and flue-dust produced, at a profit, either in the shape of mixed mortar or of ground ballast for making plaster, concrete, &c. At the present time machinery is on order for the manufacture of artificial stone from the clinker.

**The Norwich Destructor.**—This is a two-cell plant, erected at the new mills sewage pumping station of the Norwich Corporation. It was put down specifically for the purpose of raising steam, tenders having been invited upon the basis of specifying the quantity of steam to be raised instead of specifying the number of cells required. The destructor is of the single-row type, but is fed from the top, this design having been adopted to suit an existing building which it was desired to utilise. The boiler is of the Babcock and Wilcox type of 735 square feet of heating surface. It is placed as close as possible to the pair of cells, and communicates directly with the chimney. It supplies steam for driving air compressors for Shone's patent sewage lifting machinery. The working pressure is 120 lbs. per square inch. The main features of the furnaces are precisely the same as those at Bradford. The feeding arrangements are somewhat different, there being no room to make an inclined approach roadway for carts to tip on to the top of the furnaces as is the case at Edinburgh and Bradford. There is a pit provided

below the ground level. In this pit several hopper wagons run on rails. They are brought up to the tipping beam and the carts tip into them. The bodies of the hopper wagons are then lifted off the wheels by a travelling crane and conveyed to the charging holes of the furnaces. The doors in the bottom are opened and the refuse dropped on to the drying hearth. These two furnaces, on their official trial by the city engineer of Norwich, were found to burn 30 tons of refuse per twenty-four hours, or 15 tons per cell per twenty-four hours. They evaporated over 2,400 lbs. of water per hour from cold river feed to a steam pressure of 120 lb. per square inch. These results are largely in excess of the maker's guarantee. The general results obtained from this plant have been of a highly satisfactory character.

At this point a brief description of the plant which is about to be erected for the Pembroke Township Commissioners, County Dublin, in connexion with their electric lighting station, may not be out of place. The general scheme of the plant has been arranged to suit the electric lighting plans of Mr. Robert Hammond, the consulting engineer of the Commissioners. The destructor will consist of two cells of the same size as those at Norwich, and a Babcock and Wilcox boiler also of the same size. The boiler will be capable of withstanding a working pressure of 150 lb. per square inch, the proposed working pressure of the electric light boilers being 140 lb. The furnaces will be of the back-fed type, obviating the necessity of tipping the refuse on the top of the furnaces and saving 6 ft. in the height of tipping platform, and consequently reducing the slope of the inclined road. The tipping platform and building of the destructor are to be large enough for a plant of double the size, which will probably soon become necessary. When that time arrives all that will be required will be to add two cells and another boiler of the same size. For all this provision is made in the original scheme. The tipping platform is so arranged that the coal for the electric-light boilers will be tipped from it exactly where it is required, and the space under the tipping platform will form on one side coal bunkers and on the other side a cable

store. The destructor, in addition to relieving the Commissioners of a large quantity of objectionable refuse, will provide some 80 horsepower in aid of the electric-light station and in reduction of the coal bill. This will be the first high-temperature destructor to be erected in Ireland, and it will also be the first destructor in Ireland combined with a public electric-lighting plant. The Commissioners of Pembroke township are therefore to be congratulated upon their foresight in becoming the pioneers of the sanitary disposal and economical utilisation of town refuse in Ireland.

#### BUTTRESS FINIALS, WOOLPIT CHURCH.

THESE characteristic examples of mediæval grotesques from Woolpit Church, Suffolk, are from sketches by Mr. H. Percy Adams.

#### COMPETITIONS.

**PUBLIC PARK, WIDNES.**—The first premium of thirty-five guineas in the public competition for the best design for laying-out the Appleton House Estate as a public park has been awarded to Messrs. William Barron & Son, Elvaston Nurseries, Borrowash. The area of the park is about 36 acres, and in addition to the general plan of the park, which contains a lake, cricket and recreation grounds, lawn-tennis grounds, bowling-green, gymnasium, &c., Messrs. Barron & Son furnish three alternative plans for dealing with Appleton House and premises; also designs for entrance gates, band-stands, shelters, fountains, &c.

**NEW CAFE, BOTANIC GARDENS.**—At the Botanic Society's Gardens, Regent's Park, a new public café has been erected, together with a private dining-hall (43 ft. long by 30 ft. wide), reading and reception rooms, and ladies' and gentlemen's cloak-rooms. There is a spacious "hall lounge," entered from the main conservatory. With the exception of the café, the building is intended for the exclusive use of Fellows of the Society and their friends. The foundations and superstructure were carried out by Messrs. Huntley Bros. of Croydon; the decorations and furnishing by Messrs. Maple & Co.; and the heating by the Thames Bank Iron Co. The architect is Mr. H. W. Hetherington Palmer, London.



Finial Figures, Woolpit Church. Sketched by Mr. H. Percy Adams.



HIGHCOMBE EDGE HINDHEAD.  
STABLING GARDEN SIDE  
RAYNER STORR ESQUIRE.



WILLIAM A. PITE ARCHITECT.  
57, UPPER MONTAGUE STREET W.C.

# STABLING, HIGHCOMBE EDGE, HINDHEAD.

THE stabling here illustrated was recently erected for Mr. Rayner Storr, in connexion with a house at Hindhead. It provides two stalls, loose box, and man's apartments. The long elevation illustrated overlooks the tennis lawns, and has a garden room approached by outside steps. The tower encloses the water-tanks, fed from a well, and supplies the house. The materials are brindled brick, trimmed with red, Petersfield tiles to the roofs, and Elterwater slates on the tower.

WILLIAM A. PITE.

# CONGRESS OF THE ROYAL INSTITUTE OF PUBLIC HEALTH.

ON Thursday last week the opening discussions at this Congress took place in various halls placed at the disposal of the committees by the Provost and Council of Trinity College, Dublin. On the first day over 1,500 members had inscribed their names, and before the sittings terminated the membership had reached over 2,000. All the four sections into which the Congress was divided met at ten o'clock, but after a brief sitting adjourned to attend the inaugural general meeting, at which the President of the Institute of Public Health, Professor W. R. Smith, presided, and at which Sir Charles Cameron, the principal Medical Officer of the City of Dublin, was appointed President of the Congress.

The proceedings of Section C, devoted to Engineering and Building Construction, opened in the Engineering School on Friday with the inaugural address of the President, Mr. Charles P. Cotton, M.Inst.C.E., Chief Engineering Inspector of the Local Government Board, Ireland.

## President's Address.

After remarking that it was as true of a nation as of an individual that its maximum amount of working energy was directly proportionate to its physical health, and giving instances of the efforts made in various ancient states to encourage sanitary improvement, he observed that one important means of protecting and improving the condition of public health lay in the extension of the towns. In order to test the soundness of this suggestion,

it must be ascertained what advantages, from the point of view of public health, the towns possessed over other districts. Roughly speaking, all human habitations were divided into two broad classes, those in the towns or cities and those in the country, and an extension of the towns might seem to imply an invasion of the country by city influences, robbing it, perhaps, of some of its rural charms. But very little reflection would show that no such results would follow. The limited powers which Corporations and other Municipal bodies possessed under ancient charters and early statutes of dealing with the public health were greatly extended and enlarged by a series of Acts of Parliament, beginning in the year 1828 and followed up by the Towns' Improvement Act of 1854 and the various Amending Statutes. This legislation had for its object, first, the creation of new municipal bodies, with certain powers for dealing with the public health; second, to confer similar powers on those already existing, for the purpose of making better provision for the health and comfort of towns, as specified in the schedule to the Acts. Time would not permit him to make an exhaustive analysis of these provisions, but they might be shortly summarised as follows:—

1. They provided for the abatement of all nuisances.
2. For the regulation of sewers and drains and all sanitary conveniences.
3. For the cleansing of streets and houses.
4. For the supply of pure water.
5. For the erection of public baths and wash-houses, and
6. For the regulation of burials and cemeteries.

To effectually carry out the foregoing these corporate bodies were empowered to make by-laws regulating their due enforcement. From time to time these statutes were amended, according as exigencies arose requiring them. Then came the salutary provisions of the Public Health Act of 1878, which had done so much in the advancement of sanitary science. It also authorised the Local Government Board to confer large and increased powers on the various municipal towns in the promotion of the public health. It dealt with such important matters as the over-crowding of houses, the inspection of lodging houses, the dealing with offensive trades, and the keeping of

swine, so as to constitute nuisances. It empowered houses unfit for human habitation to be condemned. It provided for the construction of special hospitals for epidemics and infectious diseases, and generally aimed at the prevention of everything injurious and the promotion of everything beneficial to the public health. And by a later Act passed in the year 1896 all these powers could now be conferred on the several rural authorities. Such, therefore, being a brief outline of some of the advantages which the towns possessed in this matter of public health, and Parliament having thus affirmed the principle that it was desirable to extend them to the rural districts, the conclusion seemed inevitable that what was beneficial in the one case must be equally so in the other. Nature, as exemplified in country life, is none the worse for the aid of science. The old poets were fond of depicting a state of Nature as one of Arcadian bliss, but the truer doctrine of civilised life, as being more likely to realise man's highest ideal, found expression in the well-known line

"Better fifty years of Europe than a cycle of Cathay."

The scientific principles which experience had taught man to be so valuable for the preservation of health in the towns which his industry and skill had constructed, must be equally sound in their application to the country. Therefore it was that whether the towns themselves were extended, or the sanitary rules which prevailed there, to wider and larger areas, in either event it would be a means of promoting public health, and as such he commended it to the approval of that distinguished assembly.

A cordial vote of thanks was accorded on the motion of Mr. Kaye Parry, and a paper followed by Mr. Frank Leslie on "The Designing and Construction of Refuse Destructors," which, as it forms a good summary of the present position of the subject, we give in full on another page.

Before the adjournment a paper was read by Mr. James Dillon, past President of the Institution of Civil Engineers of Ireland, on "The Subsoil in Relation to Sites for Dwellings."

## Subsoil in Relation to Sites.

Mr. Dillon dealt with his subject with special reference to Ireland. The sites of many of the



old towns in Ireland had been badly chosen in a hygienic sense; the majority lay above limestone, granite, and sandstone rocks, particularly limestone rock. Nearly all were built before the introduction of water-closets, or water-carried sewage, or high-pressure water supplies. The old privy or petty asphalt system still existed in many of the towns. Surface drainage only was provided for in many towns by imperfectly-built rubble masonry sewers, with and without bottom flags, designed for the conveyance of rain, storm, or flood waters only, but, of course, not water-light. The water supply for many of these towns was obtained from wells sunk in the towns, or from springs or river water, and who could be in a position to state, should cholera visit the country, that no sewage matter could find its way into wells or pump-holes surrounded by leaky, square rubble-built drains? It was obvious that no time should be lost in compelling the town authorities throughout Ireland to at once abandon their mixed systems of wells, pump-holes, ancient privies, modern water-closets, and leaky sewers, as their continuance must sooner or later lead to fatal results.

In regard to sites for dwellings, the weather in winter was damp and chilly, and though rainfall was less annually than in England or Scotland, it fell more frequently. The prevailing wind was S.W.; there was an average of 1,431 hours of sunshine in the year, falling to fifty hours for each winter month. From this it was obvious that dry, porous, well-drained, sandy soils should, if possible, be selected for dwellings, the surface of the land being somewhat higher than the land surrounding it. The subsoil or arterial drainage should be perfected to a depth of at least 5 ft. or more below the surface. A good and sufficient outfall should be obtained of at least 5 ft. above the levels of the highest underground or flood waters. The districts surrounding the dwellings or towns should be well-cultivated, well-drained, and, if possible, sandy districts, particularly on the side of the prevailing wind. Fir, pine, or other plantations might with advantage stand to the west of a good building site. When travelling through Ireland he found that high, well-drained bog-land, covered with heather, was considered by the local people very healthy, and during the great failures in the potato crops from time to time, potatoes grown in newly-reclaimed bog-land mostly escaped the disease. Rocky sites for building dwellings on or for towns should be avoided, unless composed of porous rock foundations, as the undulating, or depressions, in the surfaces of the solid rock, whether 100 yards or 1,000 yards in length, held up the water on which the subsoils rested. This was one of the reasons why some houses were damp when built on rock foundations. Wet, retentive subsoils bring about similar results—banking up water in the subsoils.

Before finally deciding upon building sites it was well to test their subsoils and drainage outfalls in the middle of a winter and middle of a dry summer. When it was intended to build many dwellings it was well to build only a few at first, to test all matters that could in any way affect them injuriously.

#### Hidden Dangers in Sites.

Mr. Edward Magennis, M.D., then read a paper on "Hidden Dangers in the Sites of Dwelling-houses." In the course of the paper he stated that the houses in many of our towns, especially in our large towns and cities, are erected upon sites that are simply the hiding places of sewers, upon mounds that contain the remains of our ancestors, on locations that have been the reservoirs of all filth, decaying animal and vegetable matter, street sweepings, and other most objectionable materials. In winter the heat of the building and the aspirating action of fires must tend to draw noxious gases in large quantities through the surface of the soil, and thus engender disease if preventive measures be not adopted. We know that amongst the many evils attributed to insanitary sites are reckoned typhoid, cholera, yellow fever, dysentery, rheumatism, and the numerous respiratory diseases so common in our climate. England in twenty-two years of continuous war lost 79,700 lives, in one year of cholera, one of the most preventable diseases, the death-roll number was 144,860. He suggested three remedies: first, effective drainage; second, that the entire site of the house within the external walls should be covered with an impervious layer; and the third, that an hori-

zontal damp-proof course be inserted in the walls above the level of the ground adjoining.

#### The Disposal of Sewage in Tropical Climates.

On the resumption of the reading of papers in the Engineering Section on Saturday morning, Mr. G. P. Colton, formerly Heist, called upon Mr. J. Desmond, formerly Administrator of the Gold Coast, to read a paper on "The Disposal of Sewage in Tropical Climates." The paper dealt principally with the West Coast districts of Lagos and the Gold Coast. Referring to the former place, he said that a great danger was created by the storage of sewage matter in house pits and down in the loose sand. That system contributed largely to the high death rate which prevailed. Water was contained in wells, from which the people drew their drinking supply; but these wells became contaminated by the passage of sewage matter through the soil. He made an analysis of the contents of twelve of these wells, and found the water seriously contaminated. Having given the matter a good deal of consideration, he recommended that in order to get rid of the dangers arising from that contamination the soil should be cleansed by abolishing the numerous house-pits, and with regard to the wells, he suggested that every well sunk should be allowed a drainage area of a hundred yards; that instead of deep wells, covered pump wells should be provided, that they should be prevented from leakage by the use of cement, and that a space around each of them should be bricked and cemented. The improvements, however, were not carried out, and the wells were still in an unprotected state. With regard to the proposed abolition of the house pits, the natives had an insuperable objection to such a measure. Some details were then given with regard to drainage matters and water supply in the Gold Coast District, which it was stated were in an unsatisfactory condition. Among the sources of nuisance which he mentioned as characteristic of the towns of this region was the wandering through the streets of thousands of swine. This constituted an objectionable feature, and was a continuous source of nuisance.

Mr. Kaye Parry then read a paper on the "Progress in Sewage Purification," which we shall give next week.

#### The Hygienic Aspects of Street-Making.

Mr. Edward Glover next read a paper on "The Hygienic Aspects of Street-Making," and said that properly constructed street surfaces were a large factor in the public health. In the course of the paper the author said: "In slums we find 'matter out of place' in all degrees of saturation, age, and pulverisation. In most of the ancient laneways we travel as on a switchback over various catchment areas and land-locked lakelets unable to discharge themselves into some misplaced lazy gully, which, like a tank overflow, rises high and dry above water level. In places not under charge of the Corporation or other authority we find the slums repeated, while as regards the new streets or roads of enterprising builders many of them are only jerry-made, mere 'dirt' roads, which must involve reconstruction in the future. No private owner should be allowed to make a street and then hand it over to a public authority. The authority should do the work and the cost be assessed on the proper area or individuals. Streets serve as open spaces as well as for lines of communication, and, in the case of new ones, their location, alignment, and minimum width, should be carefully considered. . . . From the traffic point of view the travelling surface of a street should be as clean and smooth as possible. Omitting altogether the kind of materials used in forming a surface it is therefore evident that (1) it should be impervious for water to lodge on the top or at the bottom of the crust, and (2) the crust should be water-tight and of sufficient strength. Street surfaces not kept clean, or which hold lodgments of even clean water, wear away very quickly under traffic, while any crust which allows water to leak through becomes bumpy, irregular, and uneven, in spite of the greatest care in maintenance. Water close underneath the crust is, as a general rule, a greater enemy to a road surface than water lodging on top. . . . In producing and maintaining a proper carriage-way along our streets, we easily see that the requirements for health and traffic are the same. Surface cleanliness is necessary for both, and it is hard to say whether scaveng-

ing conduces more to longevity for human life or road life. The same may be said in relation to ground water level in the subsoil. It is known how great a factor the soil is in the spread of many diseases, and nothing influences the ground in this way more than water. So, too, a wet subsoil makes a good street surface impossible. Although a certain amount of moisture is necessary for street surfaces, yet over 90 per cent. of their wear and tear are due to the influence of water. I do not know if street-making and maintenance are included in the curriculum for sanitary or health officers—if not, they should be, and with as much reason as ventilation, light, and allied subjects. Drainage for the efficiency and conservation of a street for the use of whatever materials constructed, must not only prevent water lodging, but also make it flow off quickly. Surface water must be compelled to remove itself automatically by proper grading and levels into gulleys in the water tables or side channels. Even upon the flattest ground there need be no difficulty in obtaining the necessary falls cross and longitudinal, because they can be worked out of the thickness of the crust itself. To prevent too much winding or distortion of the surface, and too great a height of footpath kerling, the position and number of the gulleys require accurate consideration. In regard to subsoil drainage, we have to consider it in two aspects—(1) as regards water coming from an area outside the ground covered by the street, and (2) as regards local water percolating down through a leaky crust. In the former case the water to travel laterally underground must be under pressure as coming from higher ground, or else the street must be over or upon an underground basin whose lowest point of discharge is too high. Ordinary intercepting drains outside the street area, or lowering the overflow of the basin, will prevent a wet sub-soil and lower the line of saturation to any required level in these cases. Secondly, as regards water percolating through a leaky crust, we must see that intercepting drains or lowering an overflow will not cure it. Of course, frequent minor intermediate drains would tend towards a cure, but they are practically impossible in street work. Local water travels at a very small lateral angle, and it is therefore hard to catch it. There can be no doubt that local water leaking into the soil is the chief factor in raising the 'ground water level' in most places. Water-tight street surfaces would prevent much mischief considering how large is the area of a town which its streets occupy. All houses should have eaves' gutters discharging into drains; and footpaths should have a good fall to the channels, and be water-tight also. These necessities are evident if we examine the weeping and damp-sodden walls of basements and areas, which are only too common. I have two cases in my mind where basements became unusable from water oozing through their walls from near ceiling level to the floor. Several remedies were tried and failed until the footpath was made water-tight, when the evil disappeared. A footpath should act as an external damp-course, extending beyond wall face at ground level to save the part below. Much could be said about the materials employed in street making, as well as their undoubted influence on public health, apart from proper workmanship. But probably it is not necessary in a general review to enter into such details. The choice of materials for any particular street is chiefly a question of first cost, and the public must be educated to pay for the proper article. In the near future, however, we may afford, at small expense, to have clean, smooth, and noiseless streets. Electricity, motor cars, and rubber tyres seem to point that way. If so, the new era will add to the span of human life."

The sitting was then suspended, the members being invited to assist at the presentation of medical honours—Honorary Fellowships of the Royal College of Physicians and Honorary Diplomas in State Medicine—to a number of distinguished members of the Congress. The Honorary Fellowship was conferred on Dr. Alexander Crum Brown, F.R.S., F.R.C.P., London; Sir Charles Cameron, M.D., F.R.C.S.I.; Dr. Mathew Hay, and Sir Richard Thorne Thorne, K.C.B., M.B., F.R.C.P., London. The Honorary Diploma was presented to Dr. T. W. Grimshaw, C.B., F.R.C.P.I.; Sir Henry Littlejohn, M.D.; Dr. John W. Moore, F.R.C.P.I.; Dr. W. R. Smith, D.Sc.; Dr. T. J. Stafford, and Dr. J. C. Thresh, M.O.H., Essex County Council.

The final sitting of the Section took place on



Tuesday morning, the previous day having been exclusively devoted to excursions to Belfast and various picturesque localities in the County of Wicklow.

#### Exhausting Steam, &c., from Washhouses, &c.

Mr. C. P. Cotton, who again presided, called upon Dr. McElligott to read a paper on "An Improved Method of Exhausting the Steam and Fumes from Washhouses, Sculleries, &c." Architects, he said, had adopted various devices for preventing disagreeable fumes on washing days from permeating the living rooms in dwelling houses with more or less unsuccessful results. The best device the reader of the paper had ever met with was somewhat commonly used in Lancashire and the North Midlands, and it was this method that he desired to bring before the Section. The apparatus was very effective, though it cost but a small sum, and needed no structural alterations in fixing it. A model shown had a metal base ring intended to fit over the copper, to one side of which a kind of cowl was attached, which served to direct the steam, fumes, &c., into the ordinary chimney flue in such a way that no back draught could drive the fumes again into the house. One portion of the cowl served to allow soot to fall down a vertical tube into the flue connecting the copper with the ordinary chimney. The apparatus, made in galvanised iron, might be supplied for a guinea.

The President, in thanking Dr. McElligott, described the apparatus as practical, simple, and certain.

#### The Septic Tank System.

A paper was subsequently read by Mr. R. H. Dorman, M.Inst.C.E., Town Surveyor, Armagh, on "Some Experiments with the Septic Tank System of Sewerage Treatment." There was a large attendance of engineering and medical experts among those taking part in the discussion which followed the reading of the paper.

Mr. Dorman, after the first publication of Mr. Donald Cameron's experiments, put up a small tank and filter bed on his own premises, and, following on Mr. Cameron's lines, he found he was able to get a clear, bright effluent. He then advised the Portadown Commissioners to construct experimental filters in connexion with an existing covered tank, and two small filters were constructed. With a filtering material only 3 ft. 3 in. deep, and with only a fall of 4 ft. between the tank overflow and the winter level of the River Corracin into which the filtrate discharged, satisfactory results were obtained, and had continued for some time. After some early defects had been remedied, the sewage passed through the tank normally, only requiring to be regulated occasionally by the Town Sergeant. No choking had taken place recently, the action being precisely that proceeding in the tank at Exeter, and no trouble being experienced in the working of it. The sewage due to a population of about 3,000 persons passed through the tank, but the water supply being limited not more than about 18,000 gallons of sewage passed through per day. Occasionally the tank got congested, but it was easily rectified by diverting the sewage into a by-channel for a few days, when the tank returned to its normal state of activity. The filtrate was, as a rule, faintly coloured and had a slight smell on discharge. Nevertheless, the results obtained by this simple and inexpensive process were regarded as wonderful. Nearly all the solid matter in the crude sewage was thrown into solution in the septic tank and only occasional particles of solid matter were apparent to the eye as the effluent passed down the trough to the filter beds. After passing through these, all colour had almost entirely disappeared and only a few very small particles remained in the filtrate. The author of the paper was convinced by these results that if the filters at Portadown had been of the same dimensions as those at Exeter equally good results would have been obtained. They could not obtain a depth of 5 ft. at Portadown, but it was proposed to extend the number of filters by adding a series of secondary filters composed of fine clinker, and experiments already made in this direction entitled them to anticipate the best results. For the reasons stated, the filtrate at Portadown and the degree of purification there obtained would hardly compare with the results at Exeter, or with those obtainable with good chemical processes, but from these experi-

ments the author had arrived at the following conclusions:—

1. That the cost of installation compares favourably with the cost of any other system yet known.

2. The working expenses were small, and by adopting Mr. Cameron's alternating gear they would be reduced to a minimum.

3. No sludge is left to be dealt with, and the small quantity of deposit that accumulated at the bottom of the tank only needed to be removed about once in twelve months.

4. There appeared to be no secondary decomposition set up after the filtrate was discharged into the river.

It was, the lecturer thought, difficult to decide between the septic tank system and the Sutton (Dibdin's) process for dealing with sewage, but for the treatment of ordinary domestic sewage, or that from any district, not overloaded with chemicals, he knew of no system of chemical treatment yet applied which would compare favourably with this and one or two other biological processes. Some forms of sewage might, perhaps, be too strong for the organisms found in the septic tank to deal with. The author had had no practical experience with the septic treatment of sewage overloaded with chemicals, such as that resulting from Manchester, Wolverhampton, Wednesbury, and similar places, and he would like to hear an expression of opinion from any one who had tried to treat sewage of this character by this or the Sutton process. But it appeared to him that as Mr. D. Cameron availed himself to the fullest extent of the an-aerobic as well as of the aerobic micro-organisms, he had more power at his disposal than was obtained by the Sutton process.

Dr. Kaye Parry, in the discussion which followed, said it was claimed for the septic tank that there was no sludge formed in it. To him the difficulty was that more than half the solid matter found in sewage was inorganic, upon which an-aerobic organisms could have no appreciable effect. If this matter was all liquefied the question of sewage treatment was solved, but, if not, they would have a deposit in the least convenient form for collection. The Dortmund tank was more convenient and it worked in the opposite direction.

Dr. Collison, Kingston-on-Thames, said they had at Kingston the A.B.C. process, but the demands of the Thames Conservancy Board made it necessary to seek some improved system. He had, therefore, visited Exeter for the septic tank process. A key was given to him which enabled him to go in and out of the works when he liked, and he took samples at various times as he wished. He brought away many bottles of the filtrate, and after keeping them in his room a fortnight, he poured into two long glasses an equal quantity in each of the filtrate and water of the Lambeth Water Company, and only one member of the Committee was able to tell which was which. He had also visited Yeovil, where dye and tan works produced a very foul sewage. He found the effluent there as pure as at Exeter.

Professor McWeeney asked if the septic tank had been tried with concentrated sewage, and by what means the stench was to be obviated. Dr. McWeeney expressed strong doubts whether in many cases the sewage would not be found too strong for the organisms to break down.

Dr. Woodman, M.O.H., Exeter, replying to these points, said he had never experienced any smell at the works except a slight odour of a musty kind at the entrance. The filtrate was always pure and clear like good water. He had no interest in the process, but he believed that when any other system was tried against Cameron's it would be found wanting.

Sir Charles Cameron said it had of late become evident that the bacteriologist was now as necessary as the sanitary engineer in the proper examination of sewers, and at Manchester, Liverpool, and other places the Authorities had appointed bacteriologists under the title of public analysts. Although this title might be rather a misnomer, he would suggest to the section the desirability of passing a resolution which would be considered at the final general meeting of the Congress, recommending Authorities, when appointing public analysts, to appoint bacteriologists. This suggestion was adopted, and a resolution in accordance with it was carried unanimously before the conclusion of the sitting.

Mr. Donald Cameron (Exeter) in resuming the discussion said it must be evident that there existed some force in nature which dealt with

dead organic matter. One thing had been established—that domestic sewage could be dealt with without chemicals or other artificial treatment, and that it could be treated at a lower rate for first cost and for maintenance than any chemical system with which he was acquainted. It dealt successfully with weak sewage from midden towns and strong sewage from towns and the foulest sewage in England; that of Yeovil had been effectively treated and purified by it in a natural method. He would not say there was no deposit, but in two years at Exeter there had not been any occasion to take anything out. With regard to smell, the sewage works were within from ten to twenty yards from a public highway, and people passed without knowing of the existence of the works. His first object was to let everything get into the tank, and his next to construct works that would practically take care of themselves. They only required the attendance of a man for a short time every third day to change the floaters.

Mr. Alderman Gibbons (Wolverhampton) asked whether at Exeter the drainage was upon the separate or the combined system? What effect a storm would produce, and whether the system could be applied to very strong sewage such as they had at Birmingham and Wolverhampton?

Mr. Cameron, in reply, said the combined system was in use at Exeter. The engineer's difficulties were chiefly due to storm water and rain water, and he would find the septic tank a boon, because the septic tank was better prepared to deal with storm water than other systems, which had the disadvantage of causing capital to be locked up for indefinite periods.

In order to be prepared to deal with a sudden accession of volume due to a storm, it was necessary to construct their works of an extra capacity, and thus much capital was locked up until a storm came on. That was not the case with the septic tank; and he would like an expression of opinion from any engineer present upon that point.

Mr. Kirby, Engineer, of Newport, Monmouth, thought that as engineers they ought to stand up for a simple system like that described, because it spared them the necessity of studying and criticising a great many scientific matters that they did not want to go into. If the engineer could get an effluent like that which had been laid on the table, that was all he wanted. It was, of course, very interesting to get from the bacteriologist a scientific explanation of all the natural phenomena that are involved in chemical or biological changes, but results were what the engineer wanted. The inquiry which had been officially conducted with regard to the works at Exeter had been most searching—he thought it would not have been possible to have had one more searching—and after it, Professor Dupré, Mr. Dibdin, and other experts had all recognised the merits of the system. Professor Dupré, who at first appeared to doubt the reality of such incredible results, at length declared that the results were so excellent that to extend them by applying the effluent to land would deteriorate instead of improving the effluent.

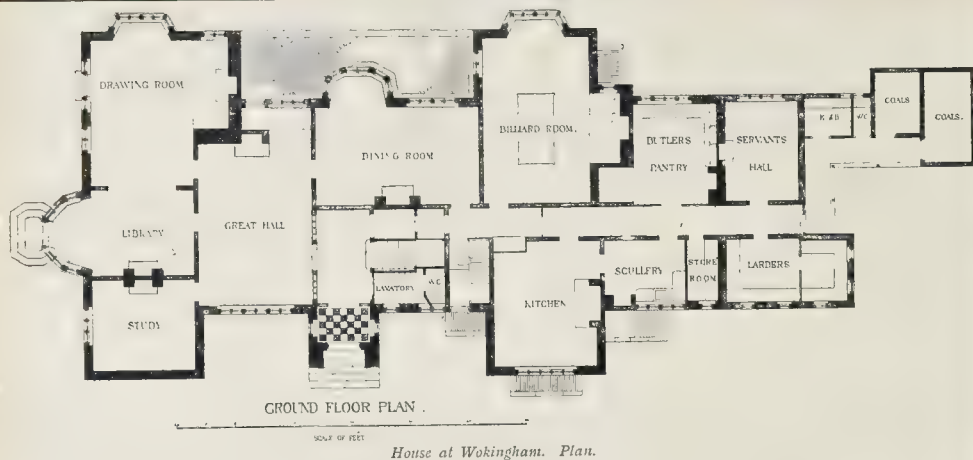
In closing the discussion the President said very briefly that he could only express the very great interest with which he had listened to the paper and the discussion, and they were greatly indebted to the author of the paper and to Mr. Donald Cameron, the inventor of the septic tank system, for his explanations.

The time having now arrived for the closing general meeting of the congress, a paper on "The Laying and Jointing of Sewer Pipes," by Mr. R. H. Dorman, surveyor, Armagh, had been turned over to the Conference of Sanitary Inspectors, and two other papers were left unconsidered, viz., "Sanitary Work of the Romans in Lincoln," by Dr. Wm. O'Neill, M.R.C.P., London, &c., and "Notes on the Design and Erection of Architectural Ironwork," by Mr. H. A. Cutler, City Engineer, Cork.

#### Sanitary Inspectors' Conference.

At the first sitting, held on the 19th inst., of the Conference, before the President Elect, Mr. Kenneth Cameron, Chief Sanitary Inspector, Aberdeen, delivered his inaugural address, a paper was read by Mr. M'Mahon, Torquay, on "The Training of Sanitary Officers." Most authorities would now demand, he thought, at least the certificate of the Sanitary Institute before appointing a sanitary inspector who was required to give his whole time to the duties of his office. That, he





House at Wokingham. Plan.

considered, was not enough, because without the possession of any practical knowledge whatever, an intelligent man might be coached in a few months to pass the certificate examination. The multifarious duties a sanitary officer was now called upon to perform required at the minimum a practical knowledge of building construction and materials, the quality and characteristics of genuine and adulterated articles of food, with a knowledge of plan drawing and land surveying. As the best means of acquiring this special practical training the author recommended the adoption of the principle of articling pupils for a term of two years to a sanitary officer of standing. During his apprenticeship he must study the Public Health Acts and the other statutes bearing upon his duties, and at the later stage must visit with his instructor premises to be condemned or approved in order to acquire a knowledge of work and materials, and of the method of dealing with skilled and unskilled craftsmen. His course of theoretical study must be directed towards passing the certificate examination, but the knowledge thus acquired would not be mere cram, but valuable, practical wisdom, of just the right kind.

Mr. Cameron then delivered his presidential address. He described the constitution of the Sanitary Inspectors' Association of Scotland, which was formed in 1891 of ordinary and honorary members as in the elder Association formed in London. Among the chief needs of sanitary officers he enumerated practical instruction, followed by examination by some central body whose certificate of competency would be recognised and accepted by everybody. A reasonable tenure of office was necessary, for without it inspectors could not always perform their duties without fear or favour. In Scotland they had got beyond this, the need for security of tenure having been recognised by statute. Why it should not be so in England and Ireland he knew not, but hoped these officers would not rest until their claims had been recognised, as in Scotland. The progress in sanitation in Scotland during the past half century was traced until to-day, the President affirmed. In Scotland, at least, the work of the sanitary inspector was better understood and appreciated than ever before, and as a consequence many of the earlier causes of misunderstanding among the various classes had now disappeared. While Ireland still held the palm in the matter of favourable death-rate, that of Scotland had fallen from 22.3 to 19 per 1,000, a reduction of 3.3. The practical saving of life took place in Scotland alone of 13,715 persons. The Local Government Act, 1889, had effected a perfect revolution in rural districts, and by the aid of the Public Health (Scotland) Act, 1897, they hoped to carry out the good work in large cities and towns with still greater vigour and success. Among the subjects discussed on the opening day and on Saturday were "The Sale of Food and Drugs Act," by Mr. Jno. Sumner, chief sanitary inspector, Wigan, "The Necessity for Amend-

ing the Law with regard to Sewers and Drains," by Sir Charles Cameron, "The Housing of the Poor," by Dr. Antony Roche, and at the closing sitting on Tuesday, "The Laying and Jointing of Pipe Sewers," by Mr. R. H. Dorman, surveyor, Armagh.

## Illustrations.

### HOUSE AT WOKINGHAM.

THIS house, the view of which was exhibited at the Royal Academy of this year, is built of red bricks and stone, with red tiles and a wooden cornice. Large cast-lead gutters form the finish to the stone bays.

The staircase and screens are of mahogany slightly inlaid with ebony and holly; and the staircase and halls are panelled with deal.

The builders are Messrs. Bottrill & Son, of Reading; the heating work is by Messrs. Longden, of London; and the glazing and casements, and also the cast-lead work, by Messrs. Wenham & Waters, of Croydon.

Mr. Ernest Newton is the architect.

### NEW ROOD SCREEN, BLISLAND.

This church is situated near the border of the Bodmin Moors, at the head of a beautiful valley.

The plan is a variation of the usual Cornish type; and the roofs are of the local waggon



Blisland Church. Plan.

form, but with beautifully carved ribs and purlins. The church retains no ancient furniture.

On the columns at the entrance to the chancel were two curious corbels, the position of which determined the level of the loft; and marks were found on the mouldings of the arches which gave the height of the loft front.

The new screen, while it followed these indications, does not pretend to be in any sense a "restoration." F. C. EDEN.

### HOUSE AT MILFORD.

This house, called "Westover House," is on the south coast of Hampshire, overlooking the Solent and the Needles. It is built of red brick, with stonework of a rich yellow colour, and dark-coloured tiling. The internal joinery and panelling is of varnished oak throughout.

Messrs. John Parnell & Son of Rugby are the contractors, and Mr. Arnold Mitchell the architect.

### COTTAGE AT RICKMANSWORTH.

MR. ARNOLD MITCHELL is also the architect of this cottage, which has been built by Mr. Charles Brightman, of Watford, the materials used being brick and tiles.

### HILL HOUSE, HAMPSTEAD.

This house, situated in one of the finest positions on the Heath, has been very considerably altered and enlarged for Mr. Geo. Fisher. The view we publish is the new garden front, commanding a very fine and extensive view westward. The walls of the old house were retained as far as possible, and rough-cast externally on the ground floor; the upper part being tile-hung. The contractor was Mr. A. Wallis, of Balham, and the architects Messrs. J. T. Wimperis & Arber.

### DESIGN FOR A SMALL COUNTRY HOUSE AND GARDEN.

We have received no information in regard to this design from the author, Mr. R. Skeleton Balfour; probably because, like many other Londoners, he is out of town at present. The design, however, speaks for itself; it is a half-timber cottage with a formal garden in front.

In the plan the dining-room, which in a house of this size would be also the morning room, faces the east, and the drawing-room the west; avoiding the mistake so often made in cottage plans of placing drawing-room and dining-room together and facing the same way. The smoking-room is nearer the drawing-room than is usual, but the doors are not contiguous and there is no practical objection to the position.

As a matter of design, our opinion would be that where the garden is so absolutely symmetrical and central in design, the house from which faces it should also be symmetrical. The *raison d'être* of the formal garden is that it combines with and forms a part of the design of the house, which can hardly be said to be the case here.

LONDON AND JOINT-STOCK BANK, WOOD-STREET. The new branch premises, which stand on the site of St. Michael's Church, along the side of Huggins Lane, are nearly completed. Messrs. Davis & Emanuel are the architects; the contractors are Messrs. Ashby & Horner, of Aldgate.

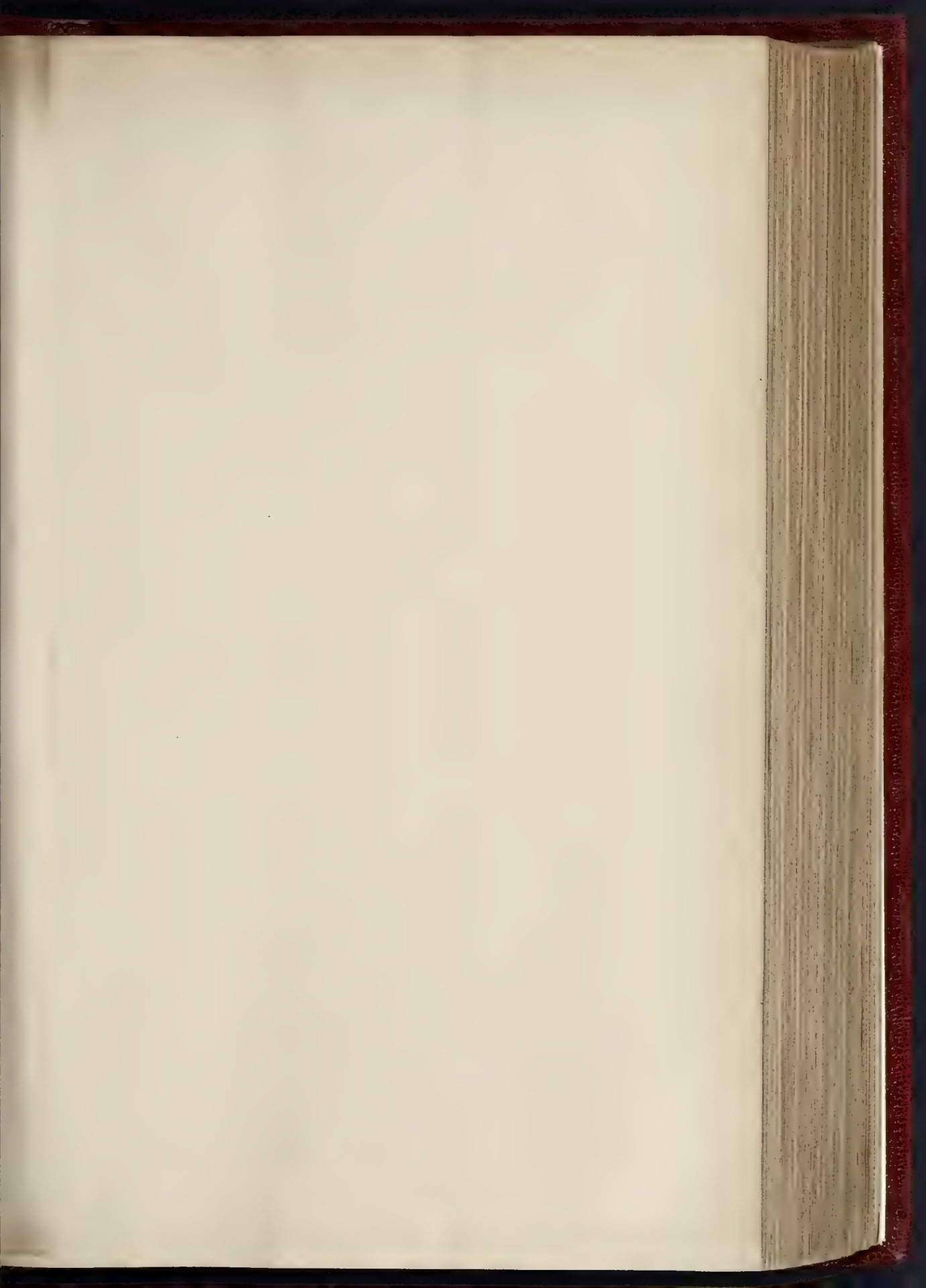




HOUSE AT WOKINGHAM — MR ERNEST NEWTON, ARCHITECT







THE BUILDER, AUGUST 27, 1898



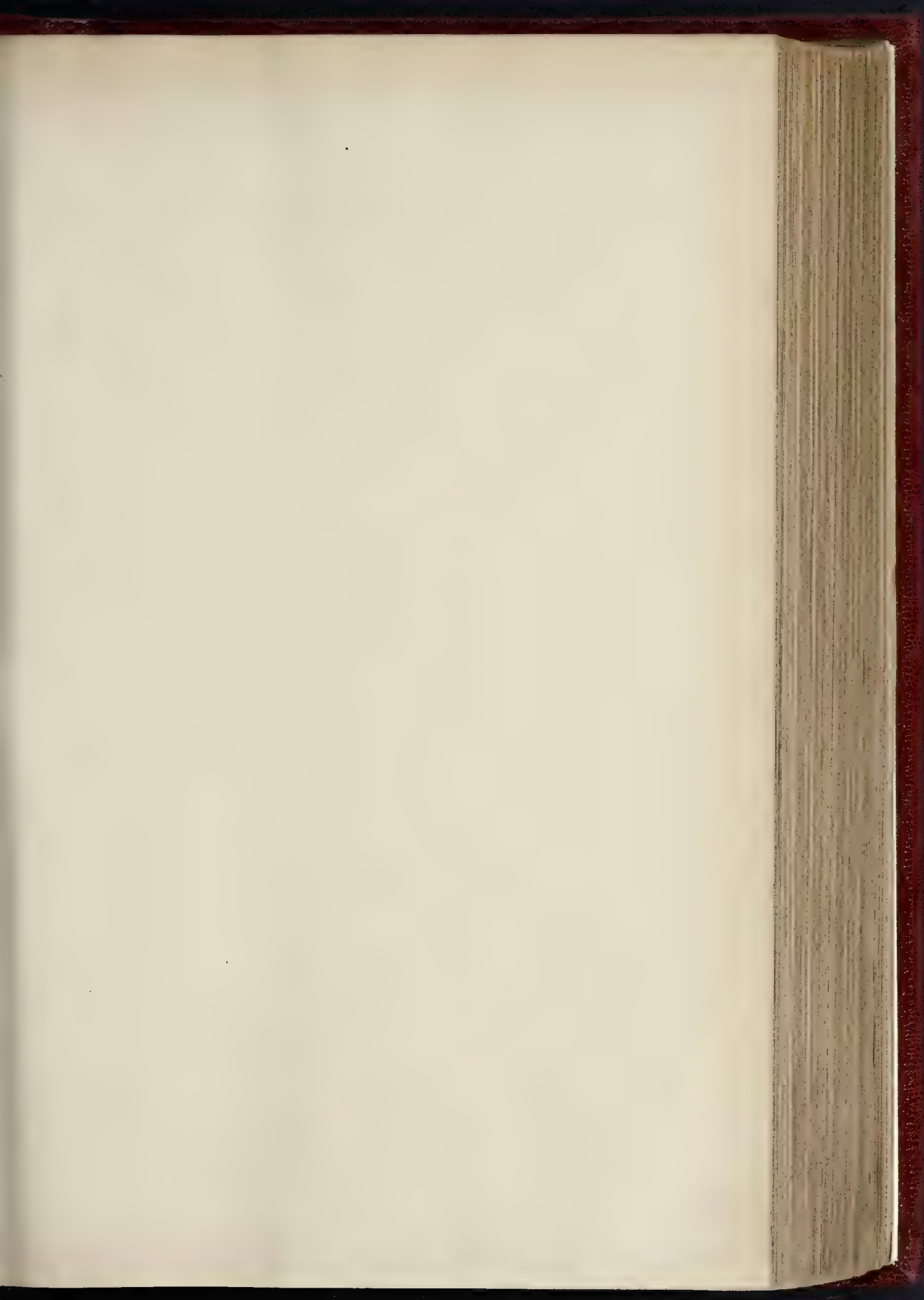




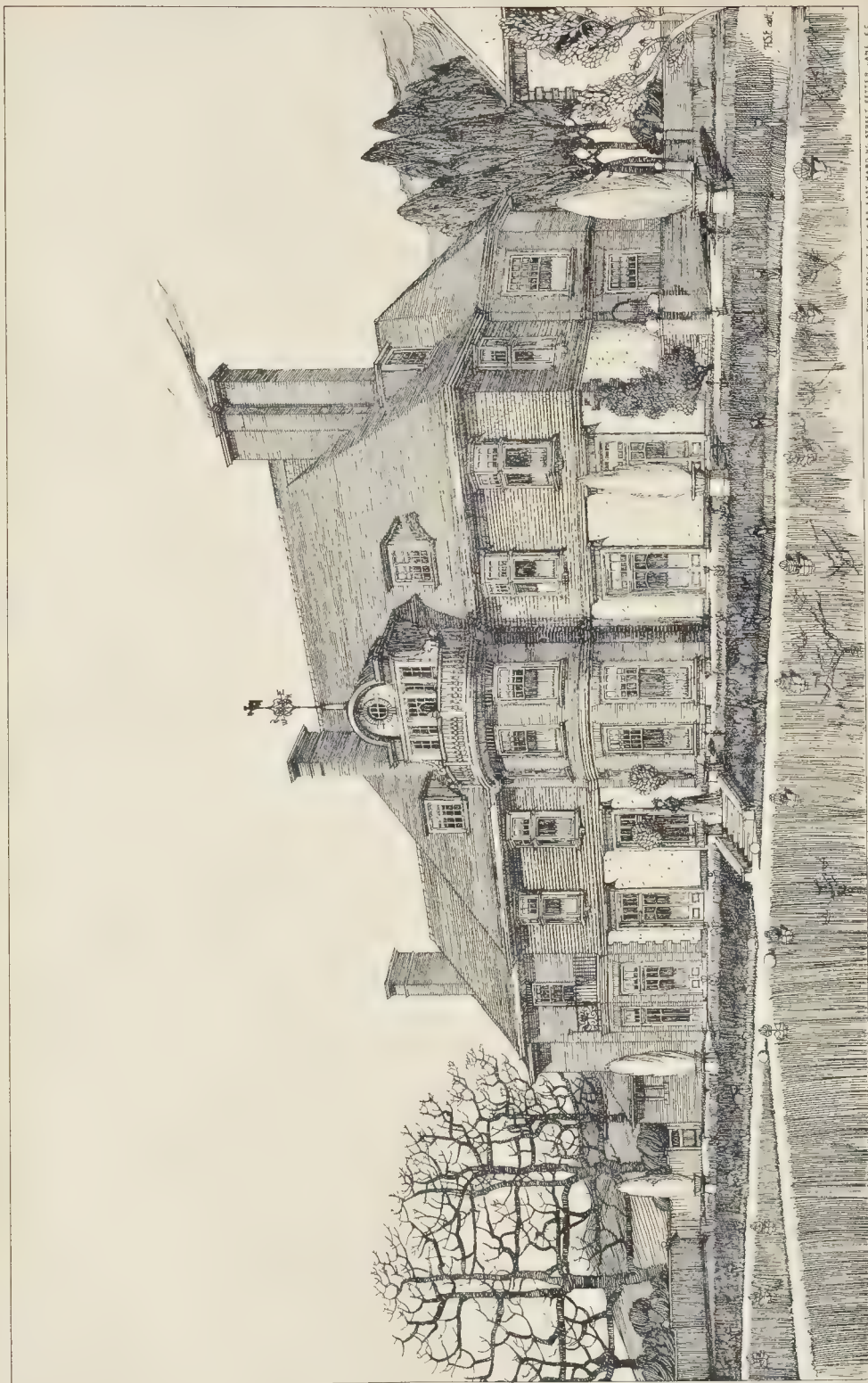
RODD SCRIVEN, BRIXLAND CHURCH, CORNWALL. MR. F. C. EDIN. ARCHITECT.



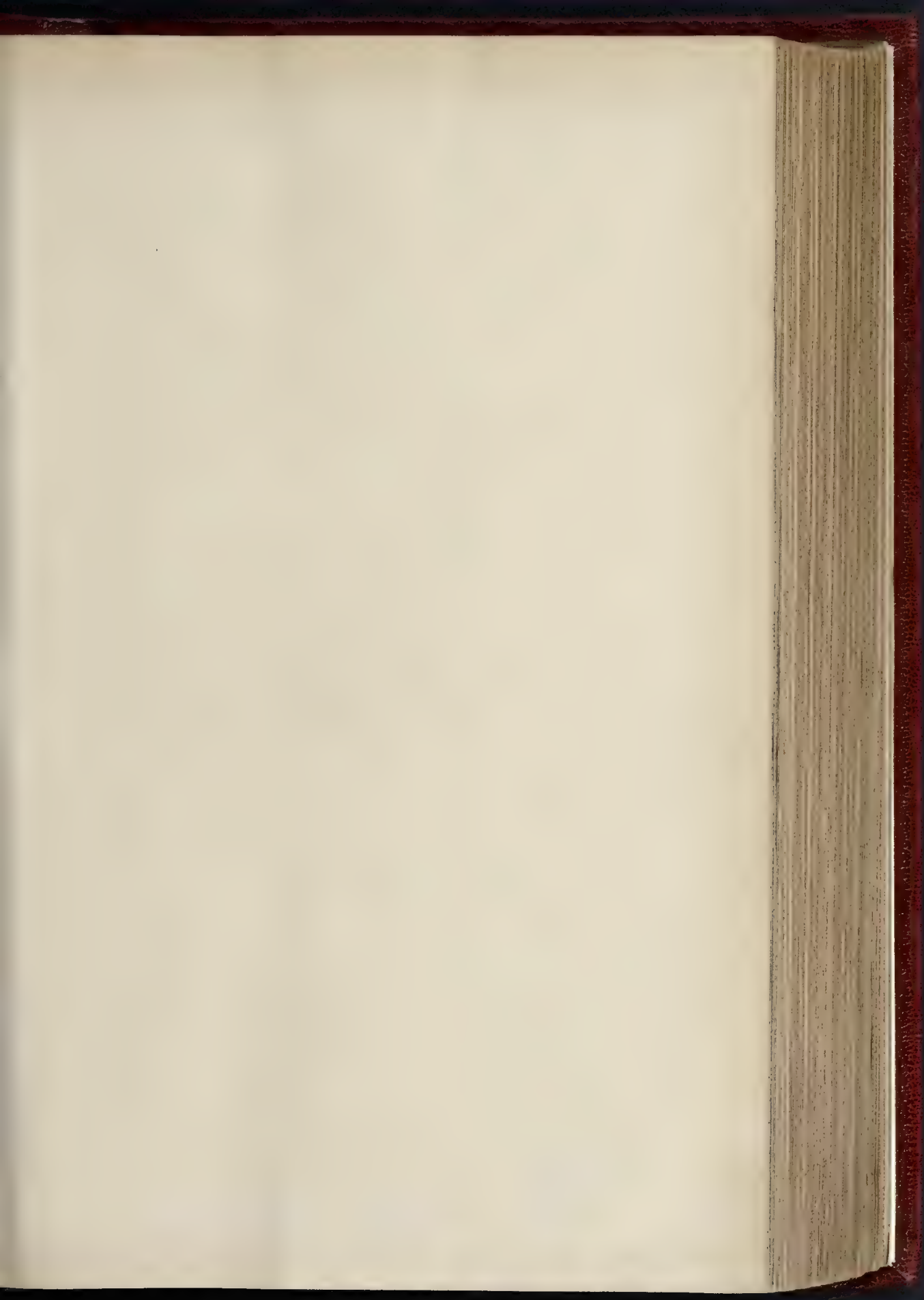




THE BUILDER, AUGUST 27, 1898







THE BUILDER, AUGUST 27, 1898

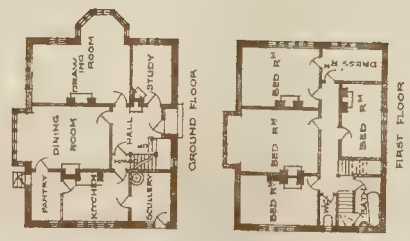


THE HOUSE AT MILFORD. — MR. ARNOLD MITCHELL, F.R.I.B.A., ARCHITECT

HOUSE AT MILFORD.—MR. ARNOLD MITCHELL, F.R.I.B.A., ARCHITECT



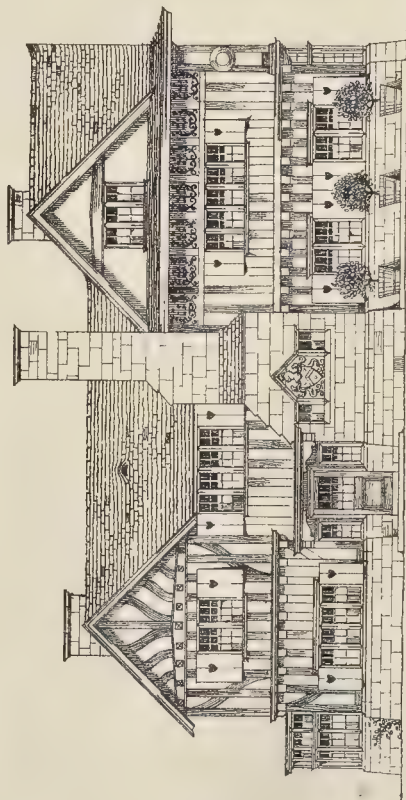
COTTAGE AT RICKMANSWORTH  
& CHARLES A FARKER ESQ FRCS.  
ARNOLD MITCHELL ARCHTCT.



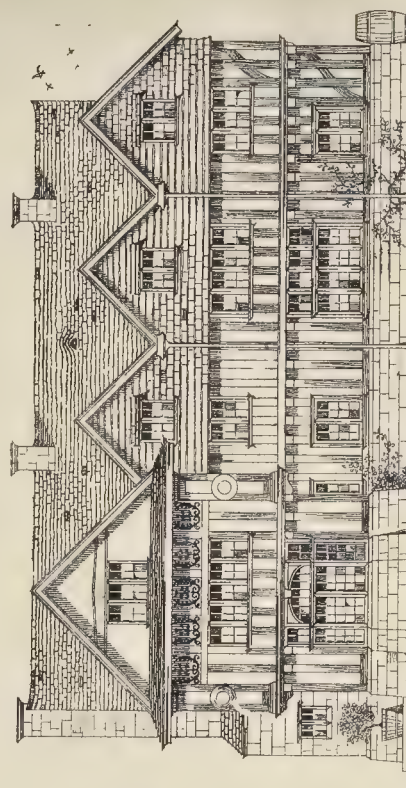
THE PHOTO SPREAD AT THE RIGHT HAND OF THE SHEET IS THE SAME



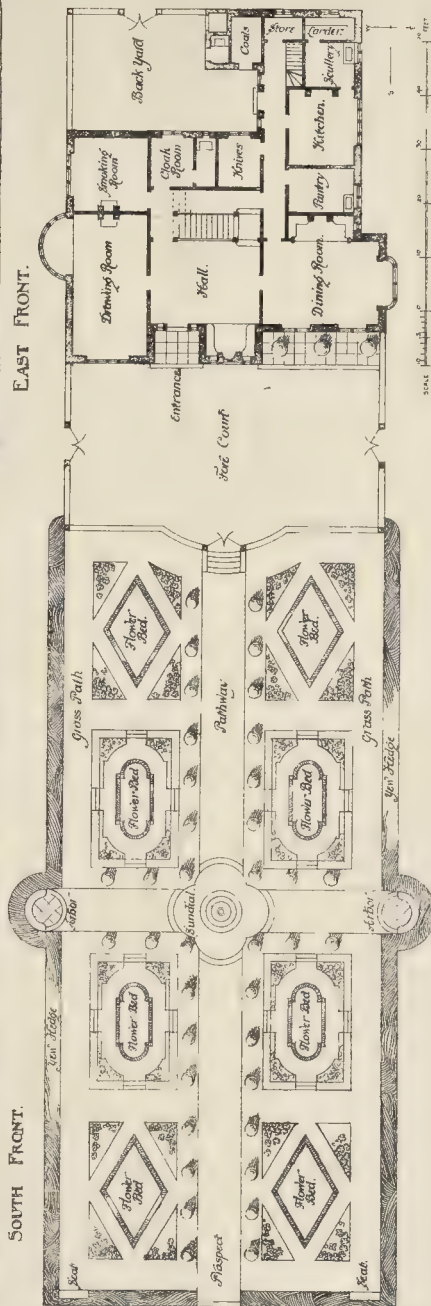




SOUTH FRONT.



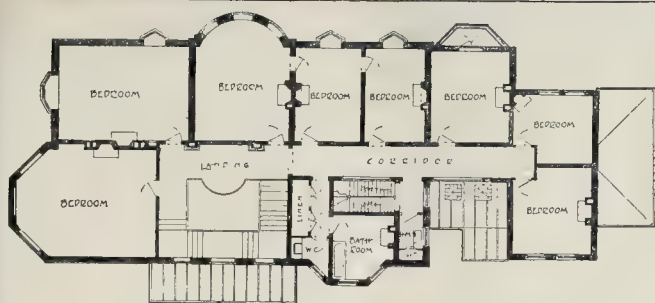
EAST FRONT.



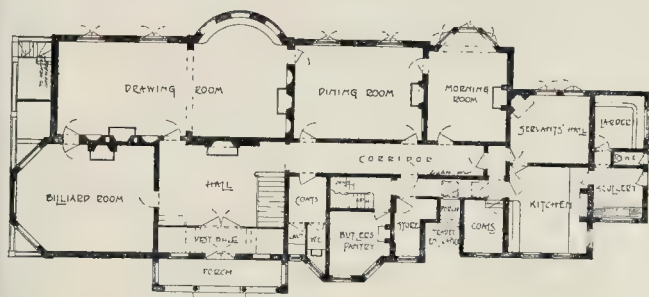
DESIGN  
FOR A  
SMALL  
COUNTRY  
HOUSE  
AND  
GARDEN  
R. SHEPLETON BALFOUR  
177-179 DEL. 1895 ARIDA







FIRST FLOOR PLAN



GROUND FLOOR PLAN

Hill House, Hampstead. Plans.

panels have been divided up with new intermediate rails and styles, because they were in an unsound condition, thus changing completely the character of the panelling.

The plaster coverings of the alcove in the dining-room have been painted, and now have a glossy surface; the ionic fluted columns, formerly white painted, are being scraped and varnished, as also are all the other plasters corresponding in that room.

New beams have been placed across the dining-room ceiling intersecting each other, and the plaster finishings to them and the walls are being picked out in colour on the white. In the library adjoining some of the entablatures of the wall decoration have been cut away and altered, together with the window alteration, in order to let more light into the room, as explained by Mr. White.

All the practical arrangements of the house have been very much improved and put into order, a task which must have caused the architect very great labour.

The members of the Association owe Mr. White their hearty thanks for the paper he kindly read to them explaining the works, and for his courtesy in showing them the house; but while it is evident that much labour and care has been bestowed on the house in putting it into a thoroughly efficient state of repair, it would be insincere to state that Mr. White's treatment of it from the aesthetic standpoint met with any great degree of approval.

W. B. H.

#### SCOTTISH PLUMBERS' CONGRESS IN GLASGOW.

THE ninth annual Scottish Congress of the Association for the National Registration of Plumbers opened in Glasgow on Thursday last week, and its proceedings extended over Friday and Saturday. The delegates, who numbered about 300, comprised representatives of employers and employed in the plumbing trade, as well as many members of municipalities and other public men interested in sanitary science. The opening proceedings took place in the Corporation Galleries, Sauchiehall-street, where, in the absence of Lord Provost Richmond and Bailie Murray, the senior magistrate, Bailie Dick welcomed the delegates on behalf of Glasgow Town Council, expressed his own and the municipality's sense of the value of the Congress in aiding sanitary progress, and hoped that the deliberations would be beneficial. He then moved that the chair be taken by ex-Bailie Crawford—a proposal which was accordingly adopted.

Sir Robert Pullar, in moving a vote of thanks to the Corporation for its reception, alluded to the progress which Glasgow had made in sanitary science.

The vote of thanks to the Corporation was cordially passed, and was acknowledged by Bailie Dick.

The President then delivered his address. He remarked at the outset that Glasgow was a very good place for the Congress to visit, because it had been from the first active in regard to plumbers' registration, had kept a keen eye on the plumbers themselves, and was far advanced in sanitary reform. The registration movement, he believed, was practically one to constitute the responsibility of the plumber between the two ends at which local authorities acted in relation to the water supply of a great city. Mr. Crawford went on to sketch the origin and progress of the movement for the registration of plumbers, and to describe the system by which it is promoted. He deplored that Parliament had not yet been able to give the effect of law to the Plumbers' Registration Bill. That Bill had for its object the permanent constitution of the movement, to fix a working organisation, to legalise by statute the use of the diploma and title conferred by registration, and to give powers of discipline in the case of those who commit acts unworthy of the craft.

On the motion of Mr. Cameron Corbett, M.P., the President was thanked for his address.

Bailie Dick, in the course of an address, warmly commended the registration movement. If its purpose had been merely to make additional profits for the employers or larger wages for the operatives he would have had nothing to do with it, but its purpose being to secure healthy homes, which alone could make a happy people, they had abundant reason to join in pushing forward the movement. He also commended the District Councils in their efforts to provide technical education, so that

#### THE ARCHITECTURAL ASSOCIATION: VISIT TO ARNO'S GROVE.

On Saturday, August 20, a party of members of the Architectural Association visited Arno's Grove, an early Georgian house, near Palmer's Green Station, Great Northern Railway, originally designed by Sir Robert Taylor in 1720 to 1723. Permission to see the house was kindly granted by Mr. V. E. Walker, the owner, and the party was conducted by Mr. William White, the architect who is carrying out alterations and repairs to the building. These have had to be very extensive owing to the serious settlements which had taken place, and also owing to the bad construction by the original builder.

The chief points of interest about the house as originally built are the simple and severe proportions of the mass, consisting as it did of an unbroken rectangular block in the centre, rising to three stories, flanked by a lower wing at either end. The east or entrance front had a central door and rectangular openings filled with sash windows in the central block, while two large Venetian windows occupied the wings. The west front was entirely lit by rectangular openings filled with sashed windows and relieved by a central semicircular bay on the ground floor only. The north end of the house, being a blank wall, was screened by a graceful Classic portico with fluted columns of wood on stone bases, forming a sort of summer house. The back wall of this is embellished with sash windows with the familiar heavy sash bars, but these windows were inserted purely for ornament and they do not light the rooms behind them. Over these are niches containing busts.

In the interior the chief feature is the fine staircase entrance hall. This is open to the level of the first-floor ceiling, and its walls and ceiling are painted with allegorical subjects in the style prevalent at the date of the building of the house. The hall is 34 ft. by 28 ft., by 24 ft. high. The staircase is of oak, with twisted balusters and ramped handrail, and open strings with carved spandrel ends to the steps.

Between the dining and drawing rooms is a pleasing little alcove with plaster covered

ceiling ornamented by interlacing ribs closely set into a sort of basket-work pattern. The alcove is open to the dining-room, being separated from it by a pair of fluted ionic columns, and has a door from it leading to the drawing-room.

The alterations carried out by Mr. White have been, besides rebuilding a large part of the outer walls and generally making the main structure sound, the following:—All the sash windows, except those on the top floor and the sham ones in the north portico, have been taken out owing to their decayed state, and have been replaced with large oak double hung casements, with transom above, and filled with large sheets of plate glass. The oak frames are oiled and varnished. The same has been done to the two large Venetian windows. A block of building has been raised over part of the south wing, very much destroying the original mass design. A large and heavy portico has been built to shelter the entrance door. This consists of a flight of steps forming a base, and covered with a flat-roofed porch, rectangular on plan, and enclosed with heavy Corinthian columns. The shafts of these are of a red stone, and the caps, bases, and entablature of Weldon stone. The roof is of Hayward's glass prism pavement lights.

Inside the house the staircase has been altered by taking three steps off the top flight and adding them to the lowest flight in order to get more head-room in the passage from the hall to the dining room. The effect of this is to raise the outer hand-rail about twelve or more inches above the wall or dado-rail, as the latter could not be raised without covering the lower part of the wall-painting. The whole of the newels are new, and a series of coupled balusters has been inserted to add strength to the balustrade. The well-string has been carved. All the carving of the new parts is of the character much in vogue among the later Mediaeval revivalists about twenty-five years ago. In addition to this, all the old varnish or beeswax has been scraped off or otherwise removed, and the whole, now a light brown, is freshly varnished or French polished. The handsome old oak doors have been treated in a similar manner.

In a room on the east front the old large deal



the members of the trades might be in a fit state to claim registration by legislative enactment.

The Congress thereafter proceeded "to consider what means can be taken to secure the early passing of the Plumbers' Registration Bill into law." In the course of the discussion Mr. Galloway remarked that the first thing to be done was to improve the procedure of the House of Commons. Mr. Lees Knowles suggested that a deputation should wait on the various Local Government Boards, and thereafter on the Prime Minister. Personal interviews had more weight than petitions, and if it were pointed out that the Bill had been three times read a second time—the principle thus being affirmed—the measure might be adopted by the Government.

Mr. J. G. A. Baird, M.P., concurred in that suggestion, and said pressure might be brought to bear through the Worshipful Company of Plumbers.

The Congress then adopted a resolution renewing its approval of legislative sanction being given to the Registration movement; recognising that an effort should be made to induce the Government to adopt the Bill, and calling upon the Scottish District Councils to take prompt and energetic action for the same object, particularly by enlisting the co-operation of the local members of Parliament.

The Congress then adjourned, and resumed its sittings on Friday and Saturday, and dealt with questions of education, examination, and registration.

In connection with the Congress an exhibition of plumbers' work and appliances was held, the arrangements being in charge of a special committee of which Mr. James Anderson, of Messrs. Ingelton & Co., was convener. The exhibition consisted of three main divisions—sanitary goods and appliances exhibited by manufacturers; specimens of modern plumbing work made by journeymen and apprentices; and of specimens of ancient and defective plumbing work taken from old buildings and the like. In order to give a fair chance to the various competitors the plumbing work was divided into four sections, viz.: The work of apprentices who have not been four years at the trade; that of apprentices over that time; that of journeymen, and tools and appliances, and lead burning. Amongst the specimens of plumber work general notice was attracted by a magnificent clock tower, standing about 12 ft. high, with the arms of the Worshipful Company of Plumbers wrought in lead, an imitation of an ancient battlemented wall with lead roof and turret, finials, rain-water heads, specimens of pipe-bending and jointing, and pipes showing proper arrangements for ventilating sanitary apparatus; also specimens of various designs of lead roofing, lead bossing, &c.

Mr. Crawford presided at the opening ceremony, which was performed by Professor McKendrick.

#### ENGINEERING SOCIETIES.

**ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.**—The twenty-sixth voluntary pass examination for candidates for the offices of engineer and surveyor to Municipal Corporations and District Councils will be held at the Technical School, Princess-street, Manchester, on Friday and Saturday, September 30 and October 1, 1898. Application forms duly filled in by intending candidates, together with entrance fee of 2s., must be in the hands of the Secretary (11, Victoria-street, Westminster) on or before September 5.

#### BOOKS RECEIVED.

**SANITARY INSTITUTE.**—List of exhibits to which medals have been awarded (Offices of the Sanitary Institute).

**HURST'S ARCHITECTURAL SURVEYORS' HANDBOOK** (E. & F. N. Spon).

**WIRELESS TELEGRAPHY.** By R. Kerr. (Seeley & Co.).

**SCIENCE AND ART DEPARTMENT.**—The Lords of the Committee of Council on Education have received a request, on behalf of the Hungarian Government, for a selection of works for which awards have been made in the National Competition of this year, to be sent on loan, at the expense of the Hungarian Government, for exhibition in the new Industrial Art Museum at Buda Pest, and have promised to afford every facility towards this object. The Schools of Art are being asked to state in each case whether works may be sent.

## Correspondence.

To the Editor of THE BUILDER.

### STAINING, &c., RIGA OR AUSTRIAN WAINSCOT.

SIR,—Could you give me particulars as to the methods used to stain wainscot, joiners' and cabinet work?

1. Is this staining done by sealing up the work to be stained in a room, or is it done in a properly-built air-tight room, specially used for fumigating? Can the work be fixed (say if dado or staircase or doors) first, then the room properly sealed up, or fastened up a time, and then fumed?

2. How is the ammonia used and what quantity would be wanted? In what form is it used, liquid or lump?

3. Would the wainscot have the same colour if the spirit of ammonia, say 840 fort liq., was used rubbed on with a piece of rag?

4. How is wax polish made and used to obtain a dull effect? CORNWALL.

\* 1. Both. The work if fixed first, and the room or staircase sealed up, gives the most satisfactory result as regards tone of colour, as the whole work has the same strength of ammonia to contend with. When a fumigating room is kept, work of a given size only can be put in, consequently various tones of colour are obtained.

2. In a room, say, of 20 ft. by 12 ft., dishes or soap plates would be placed on the floor and filled with liquid ammonia to the number of about ten. The room, if required as dark oak, would be sealed up for twelve hours; if the tone is required of less depth of colour, say five hours.

3. Practically yes, but the objection to this is that it raises the grain of the oak as a water stain would, and again it is very difficult to apply it.

4. Bees-wax is shaved off and dissolved in spirits of turpentine to a pulp, then applied with a stencil brush, and well rubbed into the pores of the wood, allowed to dry, and finally cleaned off with a hard hair brush. This gives an excellent polish.

### APPOINTMENT OF ARCHITECT, UNION WORKHOUSE, SALFORD.

SIR,—The subject mentioned by Messrs. Worthington in the *Builder* for August 13 should not be left where it is. In the Manchester papers the following were given as those from whom the Salford Guardians would select their architect:—Messrs. J. B. Broadbent, E. Chrisfield, W. T. Gunson, Darbyshire & Smith, E. Kirby, T. Worthington, H. Lord.

If those who supported Messrs. Worthington would write to the *Builder*, we should know who the three are who did not do so. Several of the above are F.R.I.B.A.s and members of the Manchester Association of Architects. If any of them should be among the three, the sooner they are called upon to resign the better. VITRUVIUS.

### AN OLD LONDON MAUSOLEUM.

SIR,—As you always seem interested in old buildings and their fate, could you tell me what became of a "mausoleum" built by Dr. Wm. Stukely, the celebrated antiquarian (b. 1687, d. 1765), somewhere in Kentish Town about 1703? He was not, however, buried there.

Perhaps some of your readers might know if anything of it were left. H. W. DICKINSON.

## The Student's Column.

### SOUND, LIGHT, AND HEAT.—IX.

SOUND VIBRATIONS (continued).

THE vibrations in strings may be either transverse or longitudinal—transverse, for instance, when actuated by a bow being drawn across the string, and longitudinal when the latter is pulled and let go suddenly. These phenomena may best be studied by means of an instrument called a sonometer, which usually consists of a string (or strings), bridged and tightly stretched over a resonance-box, much in the same way as a violin string might be in that instrument; only, in place of the keys of the violin there is a pulley over which the string passes. The string is kept in position and tightly stretched by weights fastened below the pulley. The vibrations may be modified by increasing or decreasing the number of these weights, as well as by altering the heights and distances of the movable bridges.

In the vibrations in wind instruments the enclosed column of air is the sounding body, that is, when the sides of the tube are of adequate thickness. In reference to this part of the subject, Atkinson remarks that the sub-

stance of the tubes is without influence on the fundamental note; with equal dimensions it is the same whether the tubes are of glass, wood, or metal. These different materials simply do no more than give rise to different harmonics, and thereby impart a different quality to the compound sound produced. Vibration of air in tubes is set up either by mouth instruments or reed instruments. In the case of the former all parts of the mouth-piece are fixed, in the latter a simple elastic tongue sets the air in vibration. With organ pipes the vibrations of the air producing a musical note take place in a direction parallel to the axis of the pipe—not transversely, as in the case of the portions of a vibrating string.

In the vibration of rods the point at which the rod is clamped is a node. It is shown by calculation that the number of transverse vibrations made in a given time by rods and thin plates of the same material is directly as their thickness and inversely as the square of their length. The width of the plate does not affect the number of vibrations. A wide plate, however, requires a greater force to set it in motion than a narrow one.\* As we have already seen, the velocity of sound in any solid may be determined experimentally by clamping a rod of the solid at one end and putting it in longitudinal vibration.

In the vibration of plates, these are set in motion by first clamping them or fixing them otherwise to some object, or they may be suspended; then the periphery is scraped by a bow, or the plate being perforated a string covered by resin is repeatedly and rapidly drawn through it. Or the plates may be smartly struck, as in ringing a gong. This sets up vibration, and these plates contain nodal lines, which vary in number and position according to the form of the plates, the elasticity of the latter, and the number of vibrations. The nodal lines in plates may be made visible by employing sand in the following manner: Scatter the sand indiscriminately over the horizontally-fixed plate, then vibrate the latter, when the sand will "jump" into position by accumulating along the nodal lines. The law governing the vibration of plates is stated as follows: In plates of the same kind and shape, and giving the same system of nodal lines, the number of vibrations in a second is directly as the thickness of the plates, and inversely as their area.

Membranes are used in practice for recording sound vibrations, and for kindred purposes, especially in the applications of electricity. By reason of their flexibility they cannot vibrate unless they are stretched. They are eminently fitted for taking up air vibrations.

Not only can sound be decomposed into its constituent parts—as in König's apparatus for the analysis of sound—but the results of the analysis may be verified by synthesis, as Von Helmholtz discovered. The same observer has succeeded in explaining the different timbre, or quality of sound.

In regard to the transmutation of sound-vibrations, Mr. J. Goold exhibited at a conversation of the Royal Society in May of last year, a large steel plate, which was set in vibration by means of a synchronising generator. He demonstrated that without a resonator there is very little audible sound, but on bringing the plate into contact with a common deal board its vibration is at once transformed into a loud harmonic cord. The notes of the chord are those proper to strings. A dish of mercury placed on the nodal region of a vibrating plate exhibits a brilliant series of ripples.

It has long been known that the same form of nodal lines is always produced on the same plate under the same conditions; and we have just stated the law that in plates of the same kind and shape the same system of nodal lines is produced. From this it follows that plates of different composition must yield different patterns of nodal lines. This circumstance, though not yet much taken advantage of, may be utilised in testing plates for practical purposes, i.e., their composition, structure, and quality. Such vibration figures could readily indicate when an alloy of a substance had been properly prepared; they could be made to show the positions of cracks and flaws in plates, or local disease in old plates acted upon by weathering; fatigue in steel plates ought to be detected with facility in the same way, and there are many other practical applications of nodal lines and points. A new synchronising sound generator, invented by Mr. Goold, con-

\* Canon's "Physics," 1893, p. 261.



sists of a vibrating rubber having the pitch or vibration period of the note to be elicited. By this means the separate partial tones may be developed singly. This appliance led to the further discovery of vibration axes and vibration vortices.

Compound vibration figures may be readily produced by a method also devised by the last-mentioned observer. Sound curves are the forms produced by combining the motions of two or more simple vibrations in one resultant motion. In order to trace the form corresponding to the compounded vibrations of any ratio it is only necessary to copy the motion of a heavy weight moving, in harmonic vibrations of the required ratio, at any convenient rate. This is the method adopted by Mr. Goold: A heavy iron plate carrying the tracing paper moves slowly through the compound form, and its motion is copied by means of a fine glass pen, which is so fixed that its point falls lightly on the paper surface, yielding readily to slight alterations of level, but laterally it is immovable. In this curvilinear pendulum sound-motion is slow enough to be visible, but too slow to be audible; such "inaudible sound" has its analogue in invisible light—as, for instance, in the ultra-red and ultra-violet portions of the spectrum, and as demonstrated by photography. Its compound forms are necessarily identical with the motion-forms of audibly sonorous particles, compounded from vibrations bearing similar ratios, because pendulums and particles are governed by the same laws; whilst, for plane curves, the natural elasticity of the particle corresponds precisely to the balanced forces that serve to bring the pendulum mass to its resting-place. By means of the pendulum the peculiar forms proper to a vast variety of combined vibrations may be traced. Sound curves may be divided into two groups—single vibration curves and unison curves. Single-vibration curves of the simplest ratios, including two vibrations only, are known as Lissajous' figures; the ellipse and figure of 8 may be cited as examples corresponding to the unison and octave respectively. Unison-curves are figures resulting from the combination of two or more ellipses in one complex motion. These figures, as demonstrated by the last mentioned scientist, are vastly more comprehensive and more generally representative of common facts than single-vibration curves, because the ellipse is the resultant not only of two isochronous vibrations at right angles, but is equally the resultant of any number of isochronous vibrations at all angles. Inasmuch as sound is motion, it will be readily understood that sound-curves are also force-curves.

The vibratory motion of bodies may be rendered apparent by Lissajous' method either directly or by projection on a screen. This method depends on the persistence of visual sensations on the retina, and consists in fixing a small mirror on the vibrating body so as to vibrate with it and impart to a luminous ray a vibratory motion similar to its own; tuning forks are commonly employed for the purpose. Léon Scott's phonograph registers not only the vibrations produced by solid bodies, but by any noise whatever. Another direct method is that devised by König, which consists in transmitting the motion of sound waves to gas flames, which by their flickering (or pulsations) indicate the nature of the sounds.

We have already alluded to several practical advantages derived from a knowledge of sound vibrations, and we know that the phenomenon occurs in practically all things. Masses vibrate on the large scale as well as on a small one—the pillars and walls of a church vibrate more or less when the church bells are being rung, the sound of great ordnance causes whole buildings to vibrate even at some distance, whilst thunder "shakes the hills to their very foundation." On the other hand, sounds of less intensity are recorded by vibrations on highly sensitive "membranes," as in such instruments as the telephone and phonograph.

VICARAGE, GOBOWEN, SALOP.—The foundation stone has just been laid of the new Vicarage for the ecclesiastical parish of Hengoed and Gobowen. The plans for the house, which is on the main road on the Oswestry side of Gobowen, were prepared by Messrs. Shaylor & Mace, architects, Oswestry, and the contractor is Mr. W. Felton, Oswestry. The cost of the building is estimated at 1,500l.

PROPOSED NEW HOTEL, LOWESTOFT.—Plans of the new hotel Messrs. Spiers & Pond propose erecting on Kirkley Cliff have been prepared. The architects are Messrs. L. H. Isaacs & H. L. Florence, of London.

### GENERAL BUILDING NEWS.

CHURCH OF ST. AGATHA, SPARKBROOK, WORCESTERSHIRE.—The west front of this church, in Stratford-road, is to consist of a tower, flanked by deeply recessed entrance porches. Under the tower the baptistry is situated, and the adjoining porches are cloak rooms. There is a nave, and side aisles of six bays, and a third porch at the east end of the church. The chancel contains three bays. The choir transept is on the north side of the chancel, with organ chamber over. The choir and clergy vestries are on the south side. Accommodation is provided for 1,000 sittings, and the building is estimated to cost 10,000l. The architect is Mr. W. H. Bidlake, Birmingham.

CATHOLIC CHURCH, GILLINGHAM, NORFOLK.—A portion of the new Catholic Mission Church of "Our Lady of Perpetual Succour" at Gillingham, was opened on the 18th inst. The church has been built by Mr. F. R. Allen's executors, of Beccles, by plans prepared by Mr. R. Banham, Mayor of Beccles. It is of red brick, with a sanctuary, and five bays to the nave. When it is completed there will be seven bays. The nave is 40 ft. long by 18 ft. wide, and the circular sanctuary is 20 ft. by 18 ft.

CHURCH EXTENSION, HOLBROOK, SHEFFIELD.—The foundation-stone of a church mission-room has just been laid at Holbrook. The plans for the building were prepared by Mr. J. D. Webster, architect, of Sheffield, and the contract given to Messrs. Kirkby & Drabble.

CHURCH, HERNE BAY.—The foundation-stone of the new Church of St. John the Evangelist, Herne Bay, has just been laid by the Lord Mayor of London. The church will occupy a site in Brunswick-square. It will cost about 8,000l. when completed, the portion now being undertaken consisting of the nave and aisles. It has been designed by the Diocesan Architect, Mr. R. P. Day.

RE-OPENING OF ROLLESTON CHURCH, NOTTS.—The church at Rolleston has just been re-opened after restoration. Mr. Hodgson Fowler was the architect.

RENOVATION OF ALDREAN PARISH CHURCH, NAIRN.—The interior of Aldrean Parish Church is now being renovated under the direction of Mr. John Robertson, architect, Inverness. The building is to be arranged to accommodate about 350 sitters.

RE-OPENING OF C.U. CHURCH, COUPAR ANGUS.—This church has just been reopened after alterations. Externally the appearance of the church is little altered. The walls have been re-pointed, and the roof slates renewed. The doorway has been changed in design, and several additional windows let into the walls. Internally the old galleries have disappeared, only one remaining at the south end of the church. The pulpit is placed at the north end on a platform, round which the choir will be seated.

All the woodwork is in pine pitch, stained and varnished. Heating apparatus on the high-pressure system has been fitted in. Under the gallery a vestry and session-house have been arranged. The church is seated to accommodate close on 300. The following were the tradesmen engaged:—James Bruce, mason; John Adam, joiner; Peter Donaldson, plasterer; John Doig, plumber and gasfitter; William Gilzean & Son, painters. The plans were prepared by, and the work carried out under the superintendence of, Messrs. C. and L. Ower, architects, Dundee.

WESLEYAN CHAPEL, NUNHEAD.—A new chapel is being built at Nunhead from plans prepared by Mr. Charles Bell, of Cannon-street, E.C. The contractors are Messrs. Battley, Sons, & Holness. The chapel will seat 700, and will cost 6,400l.

PRIMITIVE METHODIST CHURCH, NEW INVENTION, STAFFORD.—A new Primitive Methodist Church is being erected at New Invention to seat 200 persons. Messrs. Johnson & Baxter, of Willenhall, are the architects, and Mr. S. V. Cotton, of Bloxwich, is the builder.

BAPTIST CHAPEL, BEXHILL.—A new building for the Baptists has just been opened at Bexhill. The school chapel, which was opened in December, 1896, comprises a hall 40 ft. by 26 ft. 6 in., which opens into it by revolving shutters. The new chapel is of similar style to the school—viz., fourteenth century Gothic. The inside dimensions are 60 ft. by 36 ft. 6 in., with double transepts, 20 ft. by 7 ft. At the northern end is a gallery. There are two principal entrances to the chapel—one in the tower, and one in front of the building, opening into vestibules and inner lobbies. In the space between the school and the chapel are an infants' room and an additional class-room. The chapel floor has an incline towards the rostrum. At the rear of the rostrum is a recess 6 ft. by 15 ft., and a screen. The roof is open timbered. At the northern end of the structure is a large two-light cathedral window, all the windows being glazed with tinted glass in leaded lights. The roof is covered with Broseley tiles, while that of the tower has a covering of oak shingles. The building has been erected by Mr. Charles Thomas; the architect being Mr. R. W. Moore, of Brighton.

STEPHENSON MEMORIAL HALL, CHESTERFIELD.—The Stephenson Memorial Hall, Chesterfield, has just been re-opened after alterations and additions involving an expenditure of about 4,000l. On the acquired ground at the end of the hall a stage has been built. It is 48 ft. wide and 45 ft. 8 in. from

front to back. The stage has doors direct both from Corporation-street and Station Back-lane. Six new dressing rooms have been built alongside the stage and fronting Corporation-street. The entrances have been entirely re-arranged. On the Corporation-street front the front entrance way has been retained, but there are three additional entrances and exits to the hall and gallery on this side. The principal entrance has four folding outer doors, which open into a lobby enclosed with a stained glass screen; and swinging lobby doors open into a crush-room about 40 ft. by 10 ft. There is also a special entrance and exit door at the far end of this crush-room, next the dressing-rooms, leading direct to Corporation-street, and also communicating with the dressing-room and stage corridor. From the crush-room there are doors to the orchestra stalls and pit stalls, and also a staircase leading to the circle seats in the gallery. There is also cloak-room and lavatory accommodation to the crush-room. The pit and gallery are each served by separate entrances from Corporation-street. The doors to the pit open direct into a corridor leading to the back of the hall. Next to the pit door is the door from Corporation-street opening at the foot of a separate staircase leading direct to the gallery. In Station Back-lane are special exit doors both to the hall and gallery, each separate from the other. The staircases have been constructed in stone, with landings to each flight. The public hall has now a floor-space of 68 ft. by 45 ft. 6 in. The orchestra stalls accommodate 168 seats, the pit stalls 380 seats, and the pit 200 seats. The heating, ventilation, and lighting have been revised. The heating is by hot water. The decoration of the hall has been carried out by Messrs. Eyre & Sons, Limited, Chesterfield. The contractor for the alterations is Mr. John Wright, Chesterfield, and the sub-contractors have been executed by the following: Mr. J. H. Mee, wood, carpenter and joiner's work and stage building; Mr. W. Watson, slating; Mr. F. Hill, plastering; Messrs. Blake Bros., plumbing, glazing, and painting. The mosaic flooring is by Messrs. J. & H. Patterson, Manchester. The proscenium fibrous plaster work and decoration to same by Messrs. F. Long & Co., London. The fireproof curtain by Messrs. Merryweather & Sons, London. The hydrants and fire-extinguishing appliances have been supplied by Messrs. Shand, Mason, & Co., London. The sun-burners and brasswork by Messrs. Guest & Chimes, Rotherham. The ventilators by Messrs. Boyle & Sons, London. The sanitary fittings by Messrs. Danks & Co., Birmingham. The heating has been executed by Mr. W. Haslam, heating engineer, Harstoft. The architect is Mr. W. H. Wagstaff, Chesterfield, whose plans were selected in competition.

PROPOSED PUBLIC HALL, PITLOCHRY, PERTH. It is proposed to erect a public hall at Pitlochry, which is to be built upon a site near the Established Church. It is to be built of stone, and it will be of the Scottish Renaissance style. The front wing measures 55 ft. in length, and the hall proper abuts on it at an angle. In the frontage on the ground floor is a vestibule, with ladies' and gentlemen's dressing-rooms on each side, and with a staircase which leads to the floor above, whereon is situated a small hall capable of seating 110 persons. The main hall itself measures 60 ft. by 33 ft. 6 in., and is seated to accommodate 500 persons, while the gallery, entered from the first floor of the frontage, affords accommodation for 112 persons. The stage is 25 ft. long by 14 ft. broad, and on each side of it are rooms suitable for the storage of baggage, while to the rear are retiring rooms for ladies and gentlemen. The height of the ceiling is 24 ft. The total cost of the work is estimated at 2,266l. Mr. Ness, the successful designer, is assistant with Messrs. John Bruce & Sons, architects, Dundee, who will carry out the work.

THE MARGATE AND SOUTHEAST KURSAALS, LIMITED.—It is proposed to form a new company (to absorb the Southend Tower and Marine Park Company) for completing the works that were begun last spring at Southend, and for carrying out a similar enterprise at Margate. The company's joint architects are Mr. George Sherrin and Mr. John Clarke. The latter has prepared plans and designs of a pavilion (capacity for 4,000), a restaurant, baths, promenades, &c., and nineteen shops, on a freehold site at Margate, which has been acquired for 45,000l. at an estimated cost of 90,000l., including furniture and equipment. The site has a sea frontage of about 600 ft., near the jetty, and the buildings will stand upon columns, thus providing a front promenade or spa with an entrance from Fort Hill. The buildings at Southend now being erected by Mr. Abram Kellett, of London and Willesden, from the plans and designs of Mr. Sherrin and Mr. R. J. Gifford Read, C.E., include an "Eiffel" tower, with a circus within its base, and an arcade of sixty shops, to cost, it is estimated, 80,000l. The site covers about 26 acres of garden ground, and the surplus land will be used for the erection of twenty-seven shops and fifty-three houses.

CHANCEL SCREEN, &c., ST. PETER'S CHURCH, NOTTINGHAM.—The Bishop of Southwell has just dedicated new chancel screen and choir stalls at St. Peter's Church, Nottingham. The stalls, which are of oak, are late in character. The fronts to the boys' book boards are pierced with panels of trefoil tracery, while the fronts of the men's bookboards



have quatre-foil panels; the backs of the men's seats are panels with trefoil heads with coved canopy over same, the carved cornice to the canopy being surmounted by a cresting. The ends of the stalls have traceried panels and all spandrels are carved. The new screen is late Decorated in character, and has four bays on each side of a gateway. The sub-base is of polished Hopton wood stone, the remainder of the screen being of oak. The lower portion of the screen has solid panels with traceried heads on both sides. At the springings of the arch of the gateway and on the apex are angels holding shields bearing the symbols of Faith, Hope, and Charity. The figure at the apex of the arch on the east side does not bear a shield, but is in the attitude of prayer. The buttress of each post of the screen has a corbel with moulded capital, on which stands an angel playing an instrument; the head of each bay is filled with moulded foliated tracery, and all cusps have foliated terminations. The moulded ribs supporting the canopy rise from carved caps above the angels. The cornice of the canopy is filled with foliage. The cornice carries the open traceried front of the roof loft, and on the top rail of this front are carved capitals on which stand angels holding shields charged with symbols of the Passion. On the centre of the loft stands a cross with the figures of St. Mary and St. John on the side supports. A new brass lectern is given by Mr. Wm. Gibson, in memory of his brother, Jas. Baily Gibson, and others; this is the work of Messrs. Hardman, Powell, & Co., Birmingham. The new frontal, dossal, and side hangings at the east end are the gift of Mrs. Baily-Browne, and are the work of Messrs. Watts & Co., London. During the Jubilee year the organ was in part rebuilt and renovated under the direction of Messrs. Lloyd & Co., Nottingham. The chancel floor has recently been entirely renewed with Godwin's tiles and Italian mosaic. A new altar rail, in character, with the choir fittings, has been provided. All the steps to this and the chancel are of polished Hopton wood stone, prepared by Messrs. Killebride Bros., of Middleton, Derbyshire. The chancel ceiling and walls have been recently coloured and the ceiling decorated by Messrs. Powell, of Lincoln. The works generally have been carried out by Mr. Woodsend; the carving to the screen has been done by Mr. Bridgman, of Lichfield; the carving to the stalls and altar rails being executed by Mr. Wm. Garrard, Nottingham. The architects are Messrs. Evans & Son and Mr. Wm. Jolley, a late member of the firm, who has taken an active interest in the matter.

**PROPOSED LUNATIC ASYLUM, CANTERBURY.**—Lieut.-Colonel Albert C. Smith, R.E., an Inspector of the Local Government Board, attended recently at the Guildhall to hold an inquiry into the application of the Canterbury Town Council to borrow 70,000*l.* for the purchase of the Stone House Estate and for the erection of a lunatic asylum. The architect is Mr. W. J. Jennings.

**MONASTERY, CLONARD, IRELAND.**—The foundation stone of the new Monastery of the Most Holy Redeemer was laid on the 15th inst., at Clonard, Falls-road, for the Fathers of the Redemptorist Order. The new building will consist of confraternity room, parlours, refectories, community room, bishop's room, and infirmary. There will be fifty-four bedrooms. It will be four stories in height, and executed in Belfast pressed brick, with stone dressing. Mr. J. J. McDonnell, J.P., is the architect, and Messrs. W. J. Campbell & Son are the builders. Mr. Thomas O'Byrne is the Clerk of Works.

**REBUILDING OF HENGSLER'S CHURCH, HULL.**—A new church is now being erected on the site of Hengslers' late circus, on the Anlaby-road. The exterior has been extended at each side, taking in the old stabling and property entrance, and thus widening the building some 20 ft. or more. The architect is Mr. Percy Runtun, Hull.

**PROPOSED CHURCH HOUSE, LIVERPOOL.**—The committee of the proposed Victoria Church-house, at the corner of Lord-street and South John-street, Liverpool, have, it is stated, just approved plans prepared by Mr. Bradbury, the Diocesan Surveyor, and building will shortly be started on the rear portion of the site in South John-street and near Cable-street.

**BUILDING AT HAMPSTEAD.**—The fields between John-street and Pond-street have been taken for building purposes, and are now being covered with houses. The ground abuts upon the gardens of Wentworth House and Lawn Bank, which were formerly known as Wentworth-place, in John-street. The gardens are bounded by a brick culvert that, according to two old maps, appears to have carried an affluent of the Fleet from Rosslyn-hill to the pond, now filled in, at the bottom of Pond-street. The culvert is being filled with concrete for the erection of a wall along its length. Seats lived at Lawn Bank, with Charles Brown, from 1817 until 1820, when he left for Italy; at that time the house was divided, the other part being occupied by Mrs. Brawne and her daughter. The Hampstead West Heath Land Company are developing their estate on the land adjacent to Platt's-lane, leading from the Finchley-road to Child's Hill-lane and the West Heath. Some houses are being built in Roscoe-croft-avenue from the plans and designs of Mr. C. H. B. Quennell, with, we understand, Mr. H. E. Tatlow as consulting architect.

**PREMISES, ST. MARTIN'S-LANE.**—The new premises, at the corner of Great Newport-street, are

being erected by Messrs. Courtney & Fairbairn, of Camberwell, from the plans and designs of Mr. R. A. Lewcock.

**A NEW THEATRE, CHARING CROSS-ROAD.**—Mr. Charles Wyndham is about to build for himself a new theatre on the site now being cleared, of a block of buildings bounded on the west side by Charing Cross-road, and on the three other sides by St. Martin's-court. Mr. W. G. R. Sprague has prepared the plans and designs, and Mr. C. F. Kearnley's tender for 20,400*l.* is, we are informed, accepted; portions of St. Martin's-court will at the same time be widened.

**EXHIBITION, MIDDLESBROUGH.**—An exhibition of arts and industries is being promoted at Middlesbrough. The buildings, which have been designed by Mr. Frank Baker, Borough Surveyor to the Middlesbrough Corporation, are now nearly complete. The Victoria-square nearest to Grange-road Schools, and comprise two arcades 205 ft. long, extending from Dunning-street to Albert-road, and 40 ft. wide, and between them a central arcade, also 205 ft. long, but 60 ft. wide. The main entrance will be by a covered corridor from opposite the Municipal buildings in Russell-street. There will also be an entrance from Albert-road. Two exit doors will give access into Grange-road, while two doors, one on each side of the stage, will lead from the central arcade into Dunning-street. Practically the whole of the main buildings will be occupied by the stands of the exhibitors. These will be ranged down the central arcade, the two smaller arcades, leaving a main avenue down the centre, while in the large central arcade, besides a row of stalls down each side, there will also be a row in the middle. In the central arcade also will be, at the Dunning-street end, a stage, 40 ft. long by 10 ft. deep. In this central arcade will be a terra-cotta fountain, built by Mr. J. C. Jones. Outside the main building will be erected a theatre capable of holding from 400 to 500 people.

#### SANITARY AND ENGINEERING NEWS.

**PROPOSED NEW ROAD AT NORTH SHIELDS.**—On the 17th inst. Mr. Robert H. Bicknell, Local Government Board Inspector, held an inquiry at the Town-hall, North Shields, in reference to the application of the Corporation for sanction to borrow 3,000*l.* for the construction of the Northumberland Dockyard, and 300*l.* for the improvement of the Tiger Stairs. Mr. Smillie, Borough Surveyor, presented plans showing the suggested new road, and explained that a certain part of it was liable to fall away. At the close of the inquiry the Inspector and members of the Corporation visited the places referred to in the applications.

**SEWERAGE DISPOSAL, BARBY, LEICESTERSHIRE.**—On the 18th inst. Colonel W. R. Slacke, R.E., on behalf of the Local Government Board, held an inquiry at the National Schools, Barbry, in connexion with the application of the Barrow-on-Soar Rural District Council for sanction to borrow 3,000*l.* for purposes of sewerage and sewage disposal for the township of Barbry. There was no opposition to the scheme. Mr. W. H. Simpson, C.E., produced plans of the scheme, and gave details.

**SEWERAGE DISPOSAL, LEDBURY.**—The Ledbury Urban District Council having applied to the Local Government Board for sanction to borrow 3,000*l.* for purposes of sewerage and sewage disposal, Mr. Herbert H. Law, Local Government Board Inspector, held an inquiry, on the 18th inst., at the Barrett-Browning Institute, Mr. Berrington, Wolverhampton, the engineer, and Mr. J. Ellis, Surveyor to the Urban Council, were present at the inquiry. No opposition was raised to the scheme.

**THE EAST-END WATER SUPPLY.**—The intermittent supply of water to the districts within the area of the East London Waterworks Company was begun last Monday. On Sunday the normal quantity of water was poured into the East-end, but the constant supply ceased as from six o'clock on Monday morning, although water was obtainable throughout the affected districts for some three hours afterwards. The East London Waterworks Company informed the Local Government Board that the volume of water remaining in store above gravitation level on Monday morning was 160,000,000 gallons, or about one-seventh of the store. It was stated that when the reservoirs are full. It was stated that the London Company with all the water it could spare, about 4,000,000 gallons daily. Special stress was laid on the fact that where hydrants were attached to arterial mains the latter would be kept constantly supplied. In the more populous parts of the East-end standpipes giving a constant supply of water have been erected at the street corners.

**MAIDSTONE WATER SUPPLY.**—The Mayor of the Borough (Mr. J. Barker) stated on the 22nd inst. to a correspondent that he did not believe there was any cause for alarm in the town. Undoubtedly there was a scarcity of water, but there was no danger of anything like a water famine. It was only necessary that people should be economical. At the present time there were, he said, 300 persons out of the borough drinking water from one of the springs at Farleigh which were cut off during the typhoid epidemic last year on the recommendation of the Medical Officer of Health. Ewell spring was

not one of those which were proved to be contaminated, and the Town Council were about to consider the advisability of asking the water company to restore the supply derived from it. He was satisfied that the water company could not increase their supply by taking additional water from the Mid Kent Company. At present the Maidstone Company could only get about 3,000 gallons per hour from their neighbours, or a total of 60,000 or 70,000 gallons per day, whereas they originally guaranteed 300,000 gallons per day. The manager of the Maidstone Waterworks (Mr. Ware) states that the Ewell spring has been analysed fortnightly by Dr. Gregory, the company's analyst, during the past year, and it has maintained a uniform standard of purity.—*Times*.

#### STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW AT ST. LAWRENCE CHURCH, WINCHESTER.**—The four-light window on the south side of the nave of this church has just been filled with stained glass in memory of the late rector, the Rev. Henry Manning Richards. The work has been carried out by Messrs. James Powell & Son, London. The tracery lights have been filled with the dates of the late rector's holding of the living, 1871 to 1894, and with coats of arms suggestive of his career. The four large lights being have figures of four bishops, and also windows, in place of the old glass, the leading of which was worn out. This has been done by Messrs. Williams Bros. & Co., Chester, also under the superintendence of Mr. Swainson.

**ST. MARK'S CHURCH, WREXHAM.**—New choir-stalls and priest's desk have been executed in oak by Messrs. Harry Hems & Sons, from the designs of Mr. J. H. Swainson, architect, Wrexham. The new lead-light glazing is also being executed in the chancel, transept, and aisle windows, in place of the old glass, the leading of which was worn out. This has been done by Messrs. Williams Bros. & Co., Chester, also under the superintendence of Mr. Swainson.

**MEMORIAL WINDOW, ST. GEORGE'S CHURCH, TAVRO.**—A memorial window, executed by Messrs. W. L. Moore, London, has been placed in the chancel of this church. The subjects of the two lights are King David and St. Gregory the Great.

#### FOREIGN.

**FRANCE.**—M. Stanislas Ferrand, Deputy of the Seine and editor of the journal *Le Bâtiment*, has opened a subscription to raise, in Paris, a monument to the memory of Charles Garnier. A new sculpture gallery has been opened at the Louvre, in which are to be seen a series of original models in plaster and studies in terra-cotta by Carpeaux, as well as a bust by Houdon, and a figure of Christ carved in wood and dated from the twelfth century.—The "Palais des Beaux Arts" built on the Champ de Mars for the 1889 exhibition has been purchased by a timber merchant, who intends to erect it on a site in the Place des Ternes as a warehouse and sale-room. *Site transit*.—The new Salle des Députés, which has been commenced from the plans and under the direction of M. Buquet, will be 850 square metres in area and 18 metres high to the roof. It will be lighted from a large dome with glazed panels, and at night by a great number of electric lamps. Large and convenient galleries will be formed for the public and the Press.—The Government has formally accepted the legacy of the painter Gustave Moreau, and is transforming his house in Rue La Rochefoucault into a museum, which will shortly be open to the public.—The municipality of Paris have undertaken the tower of the church of Saint Germain des Prés, which is in a dangerous condition.—M. Barrias is at work on the model of a monument in honour of Victor Hugo, which is to be erected in the "round-point" of the Avenue Victor Hugo. The figure of the poet is represented as in youth, at the age when he wrote "Hernani" and "Notre Dame de Paris," seated on a rock at the base of which are four allegorical figures representing the Epic, the Ode, the Drama, and Satire.—The two bridges over the Seine leading to the Ile St. Denis are to be rebuilt, at an estimated cost of 1,200,000 francs.—On September 4 a large establishment is to be opened at Longjumeau, containing both a hospital for invalids and a refuge for the aged of the Seine-et-Oise department.—M. Jelineau, architect, of Bordeaux, has been elected President of the Société des Architectes of the south-west of France.—There is talk of building the fortifications of Rouelle.—M. Jules Doré, architect of Paris, has obtained the first premium in the competition for the proposed new Hôtel de Ville for Sens.—The Municipal Council of Lyons have adopted a scheme for getting water supply for the town from the lake of Annecy.—The death is announced of two French architects, M. Dassy, of Villiers-sur-Marne, and M. Croissant, of Paris.

**INDIA.**—Section 12 of the proposed Municipal Bill runs as follows:—(1) "The Local Government may, at any time, and from time to time, if it appears to it to be expedient so to do, appoint a proper person to be Deputy Chairman of the Corporation." (2) "Any person so appointed must possess the following qualifications, unless the Local Government in any case considers it inexpedient to require such qualifications or either of them."—*Indian Engineering*.



## MISCELLANEOUS.

GLASGOW CORPORATION PIPE CONTRACTS.—At a meeting of the Water Committee of the Glasgow Corporation on the 15th inst. the revised offers of the different firms for 1,000 tons of cast-iron water-pipes were under consideration. It appears that there is still a slight difference in favour of America of 6s. between the two lowest offers. Further consideration of the matter was deferred.

"THE UNIVERSAL DIRECTORY OF RAILWAY OFFICIALS, 1898."—This directory, compiled from official sources by Mr. S. Richardson Blundstone, is published by the Directory Publishing Company, Limited (Catherine-street, Strand). It gives the mileage of railways in England and Wales, Scotland, Ireland, Europe, Asia, Africa, Australasia, and South America, as well as the names of the engineers and other officials connected with the different lines. The work, which is well-arranged and edited, contains a mass of very useful information. The "personal index of railway officials" is an important section extending over 125 pages of the directory.

PLYMOUTH MASTER BUILDERS.—Plymouth, Stonehouse, Devonport, and neighbourhood Master Builders' Association held its 25th annual outing on the 18th inst. Leaving Millbay early in the morning, the party, numbering about thirty, went by saloon carriage to Bovey Tracey, and at the Dolphin Hotel breakfast was partaken of. Char-a-bancs were in readiness, and after the meal a start was made for a drive through the heart of Dartmoor to Princetown and Burrator. During the greater part of the day, a storm of great violence raged, and the comfort of the excursionists was greatly interfered with. At the Barn, Dousland, dinner was prepared. Mr. Albert Lethbridge, the Chairman of the Association, presided; Mr. W. G. Laphorn filled the vice-chair. A brief toast list included "Trade and commerce," proposed by Mr. A. R. Debnam, and responded to by Mr. S. A. Roach; "Success to the Association and the building trade," proposed by Mr. W. W. Blight, and acknowledged by Mr. W. G. Laphorn; and "The visitors," submitted by Mr. C. H. Tozer. The health of the chairman was enthusiastically drunk, on the invitation of Mr. Debnam. The return journey to Plymouth was made by railway.

GLASGOW SCHOOL OF ART.—We have received the annual prospectus of the Glasgow School of Art, with particulars of the splendid array of classes for teaching every branch of art. The comparative value giving the proportion of medals awarded to pupils of various schools of art. In the National competitions shows a remarkable preponderance in favour of the Glasgow school, which heads the list for the entire kingdom, and shows more than double the number of medals taken by all other schools and classes in Scotland.

WESTERN AUSTRALIA EXHIBITION.—It has been decided to hold an International Mining and Industrial Exhibition in Coolgardie in March, 1899. The Government of Western Australia have been pleased to recognise the undertaking, and have substantially supported it by granting to the Commissioners fifteen acres of land in a central position in addition to a liberal sum of money.—*Indian Engineering.*

OLD CLOCK AT HAMPTON COURT.—Messrs. Gaydon & Sons, of Kingston, have set in order the clock which for many years has stood unwound, in King William III.'s state-bedroom—of which apartment the decoration was especially designed by Wren, as the original estimate, in his own handwriting, testifies—the carvings and the painted ceiling being by Gibbons and Verrio, respectively. The clock was constructed by Daniel Quare, and is fitted in a high oak case, with ornate mountings. The two dials serve as a calendar throughout the year, and mark the hours of sunrise and sunset. The clock goes for twelve months without being rewound, and its mechanism was found to be in good condition. In the same room are two old barometers—one of them by Tompion, who died in 1713.

NEW LINING BRICK FOR SWIMMING BATHS.—The Farley Iron Co. send us a description, with diagram, of a brick which they have patented with the view of rendering a swimming bath watertight without the aid of an asphalt lining between the facing bricks and the main wall. The bricks are made with a glazed face as usual, but the sides and ends are grooved and notched in a special manner. After the bottom and walls of the bath have been formed in the usual manner, in concrete or other material, they are roughly rendered and floated with cement about  $\frac{3}{4}$  in. to 1 in. thick, and the surfaces trowelled; the walls and bottom are then lined with the grooved and notched bricks. When the bricks are thus built together on the walls and floor, and are properly cemented in place by cement (gauged), the cement fills up the recesses between the bricks and keys them together, and locks them tightly to the supporting wall or floor with the aid of the dovetailed notches. Special shapes of the bricks are made for angle joints and for the lower corners where the bottom of the bath (as usual) is sloped. The bricks are so calculated to make a watertight workmanlike construction; we do not suppose (nor is it apparently claimed) that there can be any economy

in their use, as the greater cost both in the brick and in the labour of fitting and setting, must fully balance the saving from not using asphalt, but the wall will perhaps make a more solid and permanent work when fixed.

REVERENDS, ALTON, HANTS.—The dedication of the new reredos at the Parish Church of St. Lawrence by the Lord Bishop of Winchester took place recently. The improvements at the east end of the church also included a new altar-cloth and the paving of the sanctuary with mosaic. The new reredos is from a design by Sir Arthur Blomfield, the Diocesan Architect. It is of English oak. In the centre panel is a carved representation of the Resurrection; on the right is a statue of St. Lawrence, the patron saint of the church; on the left is a statue of St. Swithun, the patron saint of Winchester; and on either side are the four Evangelists. The whole is surmounted by cresting and pinnacles.

## CAPITAL AND LABOUR.

BRISTOL BUILDING TRADES.—At a meeting of the Bristol Building Industries Federation, held on the 16th inst., a report was received from a deputation which had waited on the master builders respecting the late dispute in the building trades. The report was to the effect that the employers had decided the halpenny per hour advance to the whole of their employes should begin from the last pay day instead of from September 1, as per the arbitrator's award. This report was received with satisfaction, and the secretary (Mr. W. A. Pitt) was instructed to forward a letter to the secretary of the Master Builders' Association acknowledging the act of courtesy on their part and expressing the high appreciation felt by the members of the Federation at the manner in which the whole question in dispute had been settled.

PLUMBERS' STRIKE, DURHAM.—The plumbers of Durham city are on strike. The demand is for an advance of a penny per hour, so as to bring their wages up to the level of other towns.

## LEGAL.

## EMPLOYERS' LIABILITY CASE.

In the City of London Court, on the 18th inst., before Mr. Commissioner Kerr and a jury, the case of Mabe v. Colls came on for hearing. It was an action brought under the Employers' Liability Act by Thomas Mabe, a carpenter and joiner, against his former employers, Messrs. Colls & Sons, builders, of Coleman-street, E.C., to recover 350l. damages for personal injuries sustained in consequence of the defendants' alleged negligence. It appeared that the plaintiff was one of a number of workmen employed by the defendants, on March 8 last, to effect certain alterations at a house known as 10, Brook-street, Grosvenor-square. His case was that, while he was cutting away a joist in a room on the ground floor in accordance with instructions received from the acting foreman, a plank of wood fell upon him from a scaffold above and caused injuries which, according to the medical evidence, were likely to be of a permanent character, and to prevent him following his occupation in the future. The negligence complained of was that the scaffolding was improperly constructed, and expert evidence was called to show that it was impossible for a board to fall, as this case had done, from a properly constructed scaffold. The defendants denied all knowledge of the accident, and said that the only scaffold of the height described by the plaintiff was in the hall, and that was properly constructed and close boarded. The jury, however, found for the plaintiff, and awarded him 30l. damages. Judgment was entered accordingly with costs.—*Times.*

## SETTLEMENT OF A BUILDING DISPUTE.

The case of Stapp v. The Aërated Bread Company, Limited, was again before Mr. Justice Phillimore, sitting as Vacation Judge, on the 24th inst.

Upon the case being called on, Mr. Alexander, Q.C., representing the plaintiff, said that his Lordship would remember that it was a case in which the plaintiff sought to restrain the defendants by injunction from carrying on certain building operations during the night. The defendants, however, through their counsel, had assented to an order which disposed of the whole action. By the order the defendants undertook to complete their building operations between the hours of 6 a.m. and 6 p.m., and to pay to the plaintiff £50 damages, such sum including costs. All further proceedings to be stayed except for the purpose of enforcing the order.

His Lordship made the order as asked.

## ALLEGED INFRINGEMENT OF ANCIENT LIGHTS AT SURBITON.

On the 24th inst. the case of Philpott v. the Surbiton and Long Ditton, &c., Society, Limited, came before Mr. Justice Phillimore sitting as Vacation Judge. It was a motion by the plaintiff

to restrain the defendants from erecting buildings which interfered with his ancient lights. Counsel stated that there were negotiations pending between the parties with regard to a settlement, and asked that the motion might be allowed to stand over for a fortnight.

In answer to his lordship, the learned counsel stated that an interim injunction had been granted restraining the defendants raising one of their walls any higher.

His lordship granted the application.

## SETTLEMENT OF A BUILDING TRESPASS CASE.

THE case of Kneep v. Benson came before Mr. Justice Phillimore, sitting as vacation Judge, on the 24th inst., on a motion by the plaintiff to restrain the defendant from committing a trespass by breaking a hole in a wall and putting in certain lights. Counsel, upon the case being called, stated that the parties had come to terms, having agreed to an order by which the whole action was disposed of. (His Lordship assented to the terms which the parties had arrived at, but which were not stated in court.)

## ANCIENT LIGHT DISPUTE.

The case of Webster v. Raphael Tuck & Sons, Limited, was in the list for hearing before Mr. Justice Phillimore on the 24th inst. On the case being called, Mr. Mulligan, Q.C., for the plaintiff, said that the case came before his Lordship in the form of a motion to restrain the interference with ancient lights. As, however, the parties were in negotiation, it was hoped that a settlement would be come to, and it was asked that the case might stand over till the 1st ult. in order that an arrangement might be made.

His Lordship assented to the application.

## ALLEGED INTERFERENCE WITH ANCIENT LIGHTS AT BRIGHTON.

THE case of Smith v. Costerton came before Mr. Justice Phillimore, sitting as Vacation Judge on the 24th inst., on a motion by the plaintiff, Mr. Thos. Smith, the owner of No. 13, Gloucester-place, Brighton, to restrain the defendant, Mr. H. A. Costerton, the owner of the next house, No. 14, from building in the rear of his premises so as to interfere with the plaintiff's ancient lights. The defence was that, owing to the position of the two houses and the nature of the proposed building, the plaintiff would suffer no diminution of light, and that there was no sufficient material to warrant his lordship in granting the injunction.

His lordship said that on the evidence his opinion was that the plaintiff's light would be interfered with by the defendant's building, but allowed the case to stand over for a week in order that the parties might try to come to terms, the defendant not to raise his building on No. 14, Gloucester-place in the meantime.

## W. &amp; R. LEGGOTT, LIMITED v. GIBBONS.

THIS case came before Mr. Justice North on the 5th inst., on a motion by the plaintiffs, W. & R. Leggott, Limited, general brass founders and makers of window and fanlight openers, &c., Bradford and London, for an injunction to restrain Mr. James Gibbons, the defendant, of London and Wolverhampton, from passing off, or enabling or assisting others to pass off, his openers for skylights or fanlights for those of the plaintiffs, and from selling or offering for sale openers for skylights or fanlights or any goods under the description of "Leggott's Openers" or the "Silens Opener," or under any name or description of which the words "Leggott's" or "Silens" or either of such words, or any colourable variation thereof, form part other than and except openers or goods manufactured by the plaintiffs.

Mr. Swinien Eady, Q.C., and Mr. E. Clayton appeared for the plaintiffs, and Mr. Swinien Eady stated that terms had been agreed between the parties whereby the motion was to be treated as the trial of the action, and whereby an order was consented to restraining the defendant in the terms of the notice of motion, and for agreed damages and costs.

Mr. Justice North made the order accordingly in the terms agreed.

## RECENT PATENTS:

## ABSTRACTS OF ACCEPTED SPECIFICATIONS.

## Open to opposition until October 3.

[1897] 18,948.—BOLTS AND LOCKS: *J. Thomas*.—To the centre of the door-plate is pivoted a handle or lever that passes along the lock rail and is secured in position by a reversible clip pivoted to the handle or lever in combination with a staple on the door and a padlock; to the handle's pivoted end are pivoted, on either side, two bars or bolts, passing upwardly and downwardly through the guides and thence into the hasps when the lever is horizontal or locked; for operation, when the handle or lever is raised out of the horizontal position the upper bolt is drawn down and the lower one is drawn up out of the hasps, whilst a return of the lever bolts the door again.

19,668.—ASH PANS: *J. Harris*.—The ash-pan front has a semi-circular mould or strip along its top side, from











BOURNEMOUTH.—For the installation of electric lighting at the pier, pleasure grounds, and Winter Gardens, together with switchboards, cables, arc lamps, manducant lamps, wiring, fittings, &c. (Contract No. 2).—Mr. F. W. Lacey, Borough Engineer and Surveyor.

	Pier.	Pleasure Grounds.	Winter Gardens.	Swimming Bath.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. & J. L. Tate	47 0 0	712 0 0	1,000 0 0	248 0 0	2,437 0 0
The Walsh Electrical Co., Ltd.	978 0 0	0 11 6	4 7	1 1 7	984 10 0
John & Phillips	74 0 0	574 0 0	610 0 0	170 0 0	2,028 0 0
R. Alger & Sons	514 14 5	470 0 0	572 10 0	284 10 0	2,861 4 5
Cash Robinson & Co.	474 11 3	350 0 0	90 0 11	1 1 0	1,884 1 4
The Leeds Electrical Engineering Co., Ltd.	438 0 0	375 0 0	578 0 0	207 0 0	1,598 0 0

Warburg, Dymond & Co., informants.  
\* Accepted.

LONDON.—For internal renovation of Bedford Chapel, N.W. Mr. Alfred Conder, architect, Palace-chambers, 9, Bridge-street, Westminster.  
McConnell & Sons ..... £225 0 0  
Edmund Tomes ..... 225 0 0  
J. Grover & Son ..... 225 15 0

LONDON.—For painting and repairs to infirmary, High-street, Lewisham, for the Lewisham Union Board of Guardians. Mr. Robert Williams, architect.  
Marsh & Co. .... £470 0 0  
Leal & Daughters ..... 18 0 0  
General Builders ..... 1,420 0 0  
E. Jones ..... 1,350 0 0  
C. Proctor ..... 1,910 0 0  
T. J. Burden ..... 1,140 11 9  
W. Vanstone ..... 1,170 0 0  
Foley ..... 1,117 0 0

LONDON.—Accepted for erecting ladies' cloak-room and lavatory on the Recreation Ground, Catlam Grove House, for the Wood Green District Council. Mr. J. Guyon, Engineer.  
Jas. Paney, Wood Green ..... £222

MARKET DEEPING.—For additions to schools, for the Marley School Board. Mr. J. G. Stallings, architect, North-street, Peterborough.  
Gins & Lott ..... £485 0 0  
Shipwell & Co. .... 40 0 0

NEW MILLS.—For laying 1,200 lineal yards 18 in. pipe sewer of iron, steel, and stoneware, including 300 lineal yards of tunnel through the earth, 200 lineal yards of 9 in. pipes or thereabouts, together with manholes, storm overflows, flushing tanks, river crossings, and other contingent works, for the Urban District Council. Messrs. Spinks & Beever, engineers, 9, Albert-square, Manchester.  
J. Ainscough & Son ..... £5,195 3 0  
C. M. Collins ..... 4,284 15 8  
George Bell ..... 4,845 0 11  
J. Ford ..... 1,934 5 1  
J. Freeman & Sons ..... 4,576 10 1

ROCHESTER.—For additions, &c., to Waterside School, for the Frindsbury School Board. Mr. G. E. Boni, architect, High-street, Rochester.  
H. E. Phillips ..... £895 10 0  
C. Roberts ..... 68 0 0  
G. West ..... 28 10 11

STRANORLAR, Ireland.—For the erection of five labourers' cottages, for the Llan Guardians. Mr. W. McElwee, architect, Gaye-street, London.  
McCaffrey, Lifford ..... £750

THETFORD (Norfolk).—For the erection of a vestry, St. Cuthbert's Church. Mr. A. J. Lacey, architect, 6, Upper King-street, Norwich.  
J. W. Banning & Son ..... £373 9 1  
W. Boughton & Sons ..... 295 0 1

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT,  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17, BACK HILL, HATTON GARDEN, and 20, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
Telephone, No. 74 Holborn. Tele. Address: "SNEWIN, London."

## TO CORRESPONDENTS.

J. A. (The paragraph, referred to in your letter was not our own expression, but a quotation from a report, and was given as such, in quotation marks).—T. A. B. & S. (Below our limit).  
NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and sent to the Editor.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied direct from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances payable to DOUGLAS, POLYDORINI & CO. should be addressed to the publisher of "THE BUILDER," No. 45, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (by prepaying at the Publishing Office, 19s. per annum or 4s. 9d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

## HIGH-CLASS JOINERY, LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

## CONSERVATORIES, GREENHOUSES, WOODEN BUILDINGS,

Bank, Office, & Shop Fittings.

## CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## THE BATH STONE FIRMS, Ltd.

BATH,  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

## HAM HILL STONE. DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son The Doulting Stone Co.).  
Chief Office:—Norton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [Advt.]

## SPRAGUE & CO., Ltd., LITHOGRAPHERS AND PRINTERS.

Estate Plans and Particulars of Sale promptly executed.

4 & 5, East Harding-st., Fetter-lane, E.C. [Advt.]

## QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

METCHIM & SON (OF GEORGE STREET, WESTMINSTER) "QUANTITY SURVEYORS' DIARY AND TABLES," For 1898, price 6d. post 7d. In leather 1/- Post 1/1 [Advt.]

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

## SLATES, SLABWORK, Enamelled Slate, Marble, Permanent Green Slates.

WORKS:  
Bow, London, E. and Aberllefenny, North Wales.

BRANCH HOUSE:  
37, Victoria-street, Bristol.

## PILKINGTON & CO

(ESTABLISHED 1888),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.  
Telephone No., 2751 Avenue

## Polonceau Asphalte.

PATENT ASPHALTE and FELT ROOFING.  
ACID-RESISTING ASPHALTE.  
WHITE SILICA PAVING  
SEYSSSEL ASPHALTE.

# BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

## DIRECTORS.

CHARLES CREMER, Esq., Faversham, Kent, Brick Manufacturer.  
R. L. CURTIS, Esq., 120, London-wall, E.C., Brick Manufacturer.  
GEO. H. DEAN, Esq., J.P., of Smead, Dean & Co., Limited, Sittingbourne, Brick Manufacturers.  
E. W. GOODENOUGH, Esq., 37, Walbrook, E.C., Brick Manufacturer.  
A. J. KNIGHT, Esq., Rainham, Kent, Brick Manufacturer.  
HY. PACKHAM, Esq., of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.  
A. RUTTER, Esq., of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
J. WILLSON, Esq., J.P., of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
GEO. E. WRAGGE, Esq., of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—E. J. COLEBY, Esq., 148, Gresham House, Old Broad-street, E.C.



## ILLUSTRATIONS.

New Guildhall, Cambridge.—Mr. John Belcher, F.R.I.B.A., architect	Double-Page Ink-Photo.
"Tarn Moor," Hindhead.—Mr. A. S. Taylor, A.R.I.B.A., architect	Single-Page Ink-Photo.
House at Harpenden.—Mr. E. J. Dodgshun, F.R.I.B.A., architect	Single-Page Ink-Photo.
A Hotel in the Isle of Wight.—Mr. F. S. Taylor, A.R.I.B.A., architect	Single-Page Photo-Litho.
New Buildings, Reading College.—Mr. S. Slingsby Stallwood, F.S.A., architect	Single-Page Photo-Litho.
Sketches in Normandy.—By Mr. G. W. Collins	Double-Page Ink-Photo.

## Blocks in Text.

All Saints, Wittering	Pages 222-223	I	Sketches of London Street Architecture.—No. XXVIII.	Page 203
Additions to Reading College.—Plans				Page 221

## CONTENTS.

Building in the Argentine Republic	204	Additions to Reading College	210	A Sanitary Anachronism	213
St. Paul's, Wittering	202	Sketches in Normandy	211	The Students' Column: Sound, Light, and Heat.—X.	214
Architectural Inscriptions and Insignia	204	St. Colman's Cathedral, Queenstown	212	General Building News	214
Progress in Sewage Purification	205	Books: M. A. Buckmaster's "Elementary Architecture"		Sanitary and Engineering News	215
Children's Accident Insurance, Limited	207	H. Ansell's "Manufacture of Glazed Bricks and Glazed"		Foreign	215
House, No. 13, Bramham Gardens, S.W.	208	Sanitary Ware: E. Law's "Short History of Hampton"		Miscellaneous	216
Trades-Union Congress	208	Court: W. H. Hutton's "Hampton Court." S. Bruston's		Capital and Labour	217
St. Paul's, Wittering	210	"Renaissance in Italian Art"	219	Legisl.	217
"Tarn Moor," Hindhead, near Haslemere	210	Trade Catalogues	219	Meetings	217
House at Harpenden	210	Books Received	219	Recent Patents	217
Hotel, Isle of Wight	210	Reigate Competition	213	Some Recent Sales of Property	219
		Horsham Cemetery Chapel Competition	213	Prices Current	219

### Building in the Argentine Republic.



CONSIDERING the heterogeneous nationalities brought together in the Spanish-American countries, it is not surprising that their methods in architecture and building should present a great contrast to those of European countries; though there is little of indigenous culture. Until quite recently there have been no native architects in the Argentine Republic; and those who have now come to the front, or have been put there by friendly circumstances, owe their knowledge to the technical schools of France, Italy, and Germany. The former engineer, architect, and contractor are but vaguely defined, and are often made to include locomotive engineers, railway, dock, and paving contractors, sanitary engineers, and land surveyors, each of whom is supposed to be able to do any class of work, not excluding churches and exhibition buildings of an ambitious nature. The designer's freedom is not fettered, as the following clause in the building regulations of Buenos Ayres will show:—"The style of architecture and decoration of the fronts is optional, provided that it does not offend public taste."

Under these circumstances it need hardly be said that the various designs which are produced are of a somewhat hybrid nature, but as "public taste" is as yet a negative quantity each work is accepted as a success, provided that the rain does not come through the roof, and the building produces a satisfactory rent. This last consideration (but not the former) may be taken as a foregone conclusion, as rents are very high, and any ordinarily constructed building should bring a return of 8 to 15 per cent. on the capital invested, whether it be for residential or commercial purposes.

Buenos Ayres, as the largest and most important city in South America, with a population, according to the last census (1895), of nearly three-quarters of a million, may be taken as leading the way in structural works in this hemisphere, and, accordingly, this city has been a happy hunting-ground for foreign architects and engineers, viz., German, Italian, Swiss, Swedish, French,

and a few English; but of late years Argentine jealousy has done much to curtail their privileges and emoluments, and even competent foreigners are fast being dispossessed of their appointments, after having successfully gone through all the initial and intermediate stages and troubles connected with the railway, building, gas, water, and other services. "Argentina for the Argentines" is now the motto, and, financially and technically, they have made but a qualified success of the Home Rule programme.

In the year 1850 there existed in Buenos Ayres only ten or a dozen houses of two stories, but as land increased in value the inevitable result has come about that now high buildings are being erected, with deep excavations for large cellars which often extend over the entire site. These cellars or basements are often two deep and well lighted, in many cases with electric light. The Argentines are very receptive, quick to seize upon any innovation, but the faculty of inception seems to have been hitherto denied them; hence all modern appliances, conveniences, and methods of construction are to be found in the city, but under foreign introduction and management. These influences have naturally produced some fine buildings, mostly of a strictly regulation type with a tendency to overdo detail, much of which, however, is very good, owing to the facility with which the external plastering or stucco is handled by the Italian workmen; this, as also every class of construction work, being now almost entirely in Italian hands. Stone is scarce and costly, and the bricks are extremely rough, though otherwise of good quality, hence the fronts of the buildings of any pretension are invariably plastered; plain wall space is not in accordance with native ideas, consequently every available opportunity is taken to run mouldings and put brackets, panels, and rustications wherever space can be found to put them. The lime and cement used for this purpose are good, and the climate seems to have but little deteriorating effect upon the work; an occasional coat of paint keeps the fronts in good condition. The streets are laid out chess-board fashion in squares of about one hundred yards, but a good deal of irregularity has hitherto existed in the dimensions and the angles. A give-and-take line is noticeable as regards the width (or rather the

narrowness) of the streets, one square making up in increased or decreased narrowness for the deficiencies or excesses of its neighbour.

The greater portion of the external plaster detail owes its origin to Italian and French draughtsmen of the modern school, with all the richness characteristic of their facile pencils, which produce "free Classic" and Renaissance work in low relief; but they keep clear of the abominations of "incised ornament." They indulge, however, in innumerable pilasters and columns, with enormous parapets and meaningless pediments standing free in the air for a height of many feet; the side view of these tremendous shams has a truly ridiculous effect. It is a matter of compulsory regulation that the angles of corner sites should either be "rounded" or cut off at an angle of 45 degs., leaving a canted face of 6 ft. or 7 ft. This gives the opportunity for a special treatment, which is often effectively carried out. A custom of the old times of revolutions, and one which still prevails, is that of fixing iron gratings to the windows for security; the older type of grating is very severe and prison-like, the modern being more florid and pleasing; some good specimens may often be seen elaborately worked.

"Republican simplicity" (a misnomer in Argentina, where wealth is the only criterion of social worth) is shown by the curious juxtaposition of the houses. A large building, in many respects beautiful, may be seen adjoining a miserable tenement (perhaps occupied by a retail coal-dealer or a drinking shop of the lowest type) with the 4-in. ventilating pipe of the drain of the small tenement fixed against the side wall of the large house close to the front for a height perhaps of 60 ft. or 70 ft.; the owner of the small property having probably compulsorily had to buy the party wall rights of the upper floors of the neighbouring house, solely for the purpose of fixing the ventilating pipe. Cow-sheds and stables are often similarly situated or sandwiched between two commanding buildings, and this, too, in what may be termed "good streets," as there may be said to be no strictly residential quarter for the well-to-do middle classes. In nearly all the new buildings in the City the ground floor is given up to shops and warehouses, with a side entrance for access to the apart-

ments above, and in these apartments live many of the wealthy people of Buenos Ayres; the north end of the city is, however, gradually becoming a residential quarter for the very wealthy, where detached mansions and palaces only find a place.

Having thus stated the general conditions which exist, let it be assumed that an owner of a site wishes to build. Unless the house is to partake somewhat of the character of a palace, the owner does not seek an architect; but if he have no friend who is an "ingeniero," he seeks a master builder, or very often the humble bricklayer, and states his requirements. The builder thereupon seeks a draughtsman, mechanical or architectural, as may be, when a design is made, and generally accepted by the owner off-hand. Two copies on tracing-cloth (tracing-paper is almost unknown) are then presented at the municipality, together with a "solicitud" and specification. This latter consists of a printed form to be filled up with a few bare details, such as the size of rafters, nature of the floors and roof, strength of the mortar, &c. Several blank sheets of Government stamped paper are also required, and the "solicitud" winds up with the pious wish, "Dios guarda al Señor Intendente."

The plans, which are to 1 in 100 scale (say  $\frac{1}{2}$  in. scale), with detail of front to 1 in 50, do not show the constructive material, as sectional parts, whatever be the material, are all coloured red. After a lapse of two or three weeks, if these plans do not "offend the public taste" and do not infringe the building regulations, they can be taken out by the owner on payment of the municipal dues, which are rated by the frontage to the street, generally irrespective of other conditions.

The contract for a lump sum is then ratified between the owner and the builder. When the front wall is one metre above the ground the builder must give notice to the municipality to this effect, in order that it may be inspected. In no case must this portion of the work be proceeded with until the inspector has given his written approval. This formality having been complied with, as a rule no further inspection takes place, the owner being in a great measure safeguarded from bad material or faulty construction by constantly having the advice of his building friends, who, to do them justice, have with natural intuition a keen perception of the quality of work and material with, perhaps, a less keen perception of the quality of justice when it comes to paying the builder the amounts and at the times formerly agreed upon. Disputes are necessarily not infrequent, generally ending in the discomfiture of the builder. It is rarely worth while for him to contest the case, and arbitration is as yet in its infancy in matters pertaining to the building trade. Moreover, the foreigner knows that he will probably not be so well represented as his opponent, for although the latter may possibly be inadequately equipped either with logic or facts for the controversy, the scale may be turned by the absence of impartiality on the part of the judge.

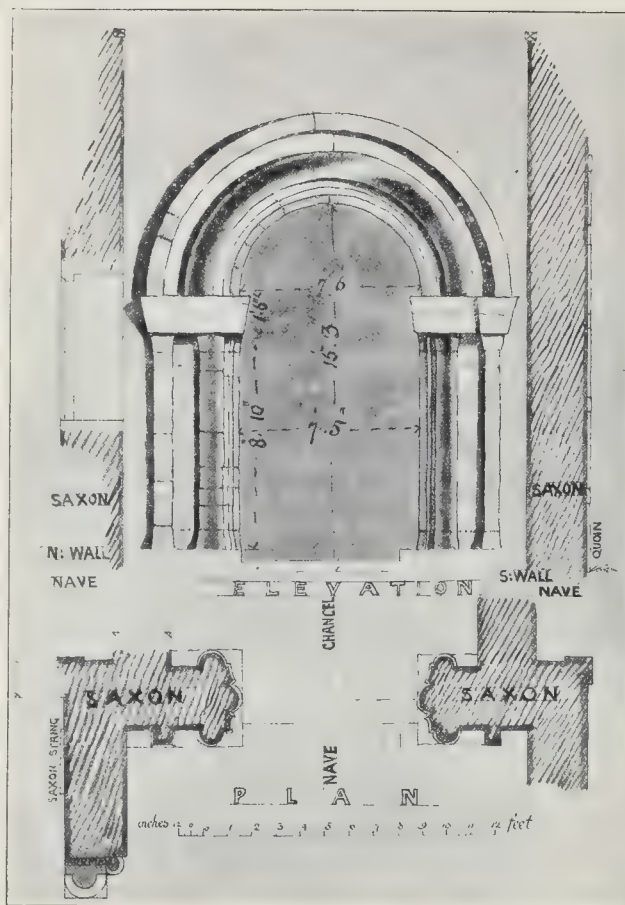
The fact that the contract is generally for a lump sum implies the absence of bills of quantities, which are not customary. The estimate is prepared with fair accuracy at so much per square metre of brickwork, one brick thick, including necessary excavation, and per metre of floor, roof, and plastering to walls and ceilings, labour and material included; whilst the doors and windows

are taken by number, including fastenings, glass, and painting; plumbing generally for a lump sum. Papering is not much in vogue except for large houses, as it is considered to harbour insects, which are ever present. The walls are, as a rule, distempered in light colours, and finished with stencilled lines and patterns as ornamental borders. The bellhanger is quite unknown. In the larger houses electric bells are used, but in the smaller properties a caller may, in the absence of a knocker, open the door and announce his or her presence by clapping hands.

In the city it is compulsory to build the front of the house in mortar (composed of lime, sand, and brickdust), and in some parts of the city mud may be used instead of mortar for the interiors, and even party walls. This mud is of a particularly tenacious and adhering kind, and serves its purpose well enough where economy is an object; it certainly is convenient to obtain so much material ready to hand, with only the expense of scraping together and mixing it with water. A compromise is often effected by building the foundations with mortar, using mud for the rest of the work. Damp courses are stated in the regulations to be necessary, but this remains comparatively a dead letter; the

Italian workmen often make a line by passing a tar brush round the wall to give the idea that a course of bricks has been laid on a tar bed; a proper asphalted damp-course is seldom put, and no other method is known; as a result the majority of walls are very damp, more especially as many inferior bricks will find their way to the work, and discrimination is used by the bricklayer in selecting them. These remarks, of course, do not apply to works undertaken by the better class of builders, of whom there are many (though they never leave the central part of the city), neither to works where an architect is employed, as in such cases the "director," as he is often called, is apt to be over-exacting, knowing the class of men with whom he has to deal.

The native brick is 1 ft. by 6 in. by 2½ in., but of rough form and face, hand made, and without frog; a thick bed of mortar or mud is required to get them bedded properly. There are three qualities—the first very hard, the second equal to English place bricks, and the third of no value except for filling up; these are used principally for the neglected kitchen, being known technically as "wall bricks" (*i.e.*, suitable for garden walls and such purposes), for the absence of frost prevents the rapid disintegration which



[See facing page





ould occur in less favoured countries. The prevailing colour of bricks is a reddish brown, which would combine well with the grey or red granite of the district; but the inveterate dislike to anything except the rough surface of the bricks has prevented any attempt being made to obtain a picturesque effect, which should at any rate not be unacceptable in the country districts. It is also compulsory in the city that every front be flour-washed when not painted, pure white being allowed. The expense of working the granite also militates against its employment, for although granite curbs and setts are much used, the native mind would revolt against the barbarity of leaving it unpolished for building purposes. Thin marble slabs, plinths, architraves, and fascias are much used, and are cheap. Marble sills and steps are also common and serviceable; fine specimens of marble staircases and linings are to be met with, and can be produced cheaper than in England. The small surplus of marble is used for paving, staircases, plaques for street numbers, and other purposes, at which the Italians are experts.

Pitch pine, white pine, and spruce are largely imported and are not dear; the country supplies a variety of hard woods of various colours, some harder than oak and apparently as durable, into which it is impossible to drive a nail without boring a hole first, otherwise the nail would double after entering about half an inch. These woods can be cut to large sizes, and are suitable for rafters, joists, door frames and, as also for heavy staging for bridge and dock construction. They would also answer admirably for half-timber work, but there is quite an unknown art in these studies. Cedar is also produced in quantities, and is very easy to work. This is

much used for principal doors, venetian shutters, and interior fittings.

The commonest form of paving for courtyards and passages is that of red tiles, which are 8 in. by 8 in. by  $\frac{3}{4}$  in.; the best qualities come from Marseilles, but very fair quantities and qualities are made in the Argentine Republic, and are by no means expensive. Imitation mosaic tiles of cement, in various designs and colours, are also made by the resident Italians, having a good effect considering their cheapness; they are also found to be durable. The ubiquitous "Napolitano" also runs the brass and iron foundries, so that every requisite for finishing a house in an effective manner, whether cheap or expensive, is ready to hand, although the effectiveness is often but temporary, as any strain or rough usage will prove the old adage of the cheap being dear.

#### ALL SAINTS, WITTERING.

**T**HE choice by the British Archaeological Association of the City of Peterborough as the headquarters for this year's Congress could not but be a good one. It is not too much to say that within a radius of some ten miles from Peterborough Cathedral the whole body of English architecture is as well represented as it could possibly be. No wonder that the Early Gothic revivalists made this part of England their special architectural hunting ground. At this day a student of the history of the art of Gothic architecture need not go much further than the area above-named for the most perfect and complete examples of his subject. The architecture hereabouts is of so exquisite a character that the archaeologist is drawn out of himself irresistibly towards the architecture which enshrines his objects.

Examples of first-class design in all the

various periods prevail on every side. It is only to a small single example of early work that it is proposed to call attention here—namely, to the chancel arch of the Church of All Saints, Wittering, Northamptonshire. The accompanying plans and sketches will perhaps make plain the dimensions and details of this remarkable work.

The nave and chancel of this little church are of undoubted Saxon design and workmanship, but it is the chancel arch only that is to be alluded to here. The drawings show that the archway has an opening of 7 ft. 5 in. in width, and a height of 10 ft. 4 in. from the lower bed of the base to the spring of the arch, which is semicircular.

The width of the chancel is 12 ft. 7 in., and that of the nave 16 ft. 6 in. The centre line of the archway is a few inches out of the centre line of the chancel, the walls of which are not parallel with those of the nave. Centrally in the soffit of the opening, both in the jambs and arch, there is a big semicircular moulding, and on each face of the wall another semicircular moulding runs up the jambs and round the arch. In the soffit between these mouldings there is a shallow concave moulding with fillets on each side of it; this also accompanies both the jambs and arch. Beneath the spring of the arch there is a great plain bevelled impost. On the face next the nave a plaster strip runs up the wall and surrounds the arch, forming a hood moulding. There is not space on the side next the chancel for this feature, and it is altogether absent there. The arch mouldings do not follow those of the jambs anything like accurately, either in position or size. For base and capital the jamb mouldings are simply extended upwards and downwards, and this is applied even to the plaster strip. On the south side next the nave there is a vertical break in the impost, and though this is not present on



the north side, there are indications that both sides were alike in this respect. Unfortunately, the jointing of the masonry is too thickly covered by whitewash to be seen. There is a suspicious look about the faces of the impost, inclining to the suggestion that there may have been originally some form of moulding on them. There is a degree of rudeness in the work generally which points to a lack of skill, according to our present standard of work, but the innocent struggle after architectural effect has its charm. This example of early building contains the well-defined characteristics of the Saxon style, and is one amongst many in the district of Peterborough which vindicates the appellation of "style" to the work immediately preceding the Norman Conquest.

To pronounce on the probable date of this arch would be somewhat risky, so many are the pitfalls which still beset accuracy in this direction. It may, however, be safely said that there is an innocent simplicity about this work, and yet withal, a true feeling for architectural effect, not to be seen in the tower arch at Barnack, where it looks as though the mason had used much effort to produce elaboration of moulding, the true value of which he had not been schooled in. The Wittering example shows evidence of contentment with bold and simple form. These are qualities which perhaps bespeak an earlier date for the work at Wittering than that at Barnack. C. LYNAM.

#### NOTES.

THE reports of the Trades Union Congress chronicle the usual amount of unconscious humour in the proceedings. The irony of things is finely illustrated in the fact that the very same page of the *Times* which contains the report of the resolution expressing sympathy with the Welsh miners, condemning the "arbitrary attitude of the colliery proprietors" and their "humiliating terms which would most probably be rejected," contains the report of the acceptance of these terms by the miners by a majority of two to one.\* In the Presidential address we of course expected to find the Workmen's Compensation Act condemned because it did not go far enough and did not extend its provisions to all trades and occupations whatsoever, and we are not surprised to be again told that the liberty to contract out of the provisions of the Act is "immoral" (in other words, it gives a man a choice of action instead of nailing him to a system); but there is a new advance made, in the condemnation of Friendly Societies, which it now appears are "usurping the functions of the State":—

"If it was logical for the State to interfere to reduce the hours of labour, and to insist that special regard should be paid to the safety of life and limb on the ground that the national prosperity depended on the well-being of the worker, the necessary corollary was that the State should care for him in times of sickness, in order that his productive powers might again be at the disposal of the nation."

The State is to forbid the workman working longer than he likes to; the State is to see that he gets as high wages as he wants, and the State is to take care of him and cocker him up when he is ill, his life being more precious to the State than that of any other class of persons. Apart from any other consideration, it seems surprising that any group

\* Probably many of the minority saved their consciences by a vote which they pretty well knew would be out-voted.

of men should have such a want of manly spirit as to contemplate, even in theory, such a system of nursing as the trades-union leaders hold up before them as an object to be desired. The eight hours movement is more rampant than ever. "Seeing that an eight hours working day will lessen the number of unemployed, improve the quality of the work, and increase the health and intelligence of the workers" (there is certainly room for the last-named improvement), "this congress declares that the time has arrived when the hours of labour should be limited to eight per day in all trades and occupations in the United Kingdom." The logic is too delightful. Work is the source of national wealth; let us all agree to do less work, and then we shall all be richer. Possibly when this programme has been carried far enough to double the cost of all the necessities of life, and drive all our manufacturing trade out of the Kingdom, the awakened "intelligence" of the eight-hour working man may arrive (too late) at the comprehension of Æsop's fable of the Belly and the Members.

M<sup>ME</sup>. CHARLES GARNIER and her son have presented to the State all the sketches and models for the decorations of the Paris Opera House. Among these is the model of the ceiling of the auditorium, by Lenepveu; the sketches for the ceilings and panels of the grand foyer, by Baudry; those for the staircase decoration, by Pils; those for the "foyer du danse" by Gustave Boulanger, and the studies for the paintings executed by Elie Delaunay in the small salons at the end of the grand foyer. In conformity with M<sup>ME</sup>. Garnier's wish all these sketches and models, which form a very valuable collection, are to be placed in a gallery in the library of the Opera House, where there is also to be placed a medallion portrait of the late architect. Many of Garnier's friends were desirous that his statue should be placed on the open space in front of the building to which he devoted twenty years of his life; but it is considered that this would be an interference with the view of the building which the architect himself would have disapproved of. It was to avoid any interference with the total effect of the façade that Alphand refused to allow any plantations down the sides of the Avenue de l'Opera.

THE "Ceinture" railway company is carrying out important works with the view of doubling the existing line between Courcelles and the Trocadéro. The work will include a large tunnel at Passy, to emerge near the Seine, opposite the Île des Cygnes. The line will be carried across the river on an iron bridge and terminate in a new station at the Champs de Mars. This is for the Exhibition; after that is terminated, the railway will join the Invalides station. The railway company "de l'Est," on its part, is enlarging its station, and has secured a number of houses next the Rue d'Alsace and the Faubourg St. Martin, with the view of forming luggage rooms and a "Douane" on their site, while the arrival platforms are to be extended as far as the galleries opening on the Place de Strasbourg, but without interfering with the façades of the latter. The work of enlarging the Gare de Lyon is also being carried on with great activity. The

old station has now almost entirely disappeared, and three new "halls" are being erected for the arrival and departure of suburban trains, while the old façade towards the Rue de Lyon and the Boulevard Diderot will be replaced by a fine building erected at a cost of 2,000,000 francs.

FROM Dr. Wheaton's Report to the Local Government Board on the sources of water supply for Carnarvon, we learn that for some years past the subject of the unsatisfactory nature of the water supplied to the borough of Carnarvon, more particularly its liability to pollution by liquid refuse from the village of Rhyd-ddu, has been before the Board. Dr. Wheaton's Report gives the particulars. The water supply is mainly from the river Gwyrfa; the whole of the valley above the intake is occupied by farms, and every farm house is on the banks of a stream discharging into the Gwyrfa. Drainage from the farm fields passes into the river or its tributaries, and many of the houses have privies built of loose stone on or near the banks. As to the village of Rhyd-ddu, it is stated that the whole of the liquid refuse from this village is discharged into the river above the intake for Carnarvon, either directly, or indirectly, by means of rubble drains or surface channels on the road side. The village is not sewered. The remedies suggested in the Report are as follows:—

- "1. The thorough sewerage of the village of Rhyd-ddu, and the disposal of the sewage in such a manner as to avoid any risk of pollution of the river.
- "2. The scavenging of this village at frequent regular intervals, in order to put an end to the throwing of the contents of pail closets, of privies or of household refuse, into the stream.
- "3. Frequent inspection of all farms and dwellings upon the gathering ground. The disposition of liquid refuse from dwellings, farm-yards, manure heaps, and the like, in such fashion that the matters shall not foul streams. The prevention, as far as possible, of manuring of land in the immediate neighbourhood of the lakes and streams.
- "4. The provision of movable receptacles for fecal matter for all dwellings upon the gathering ground, in order to prevent the direct fouling of streams by fecal matter. Strict attention to be directed to the method of disposal of contents of such movable receptacles.
- "5. The diversion of all water passing through Glan-r-afon quarry from the river above the intake.
- "6. The diversion of all surface water from the main roads from the river.

The last two measures require works of engineering of considerable difficulty. Filtration of the Carnarvon water supply has been recommended as a precautionary measure. It is doubtful, however, whether filtration, as ordinarily carried out, can, in the present circumstances of that supply, be trusted to secure a uniformly wholesome water."

Six or seven years ago the Spitalfields Market Enfranchisement Association was formed with the object of securing the private rights of the market. Charters to the respect thereof were granted by Charles I. in 1682 to John Balch, and by James II., six years later, to George Bonn, for sales every three days every week, the grantees being the predecessors in title of Sir Julian Goldsmid and others, who by a judgment of the Court of Appeal on December 18, 1887, which after several days' hearing was upheld by the House of Lords,\* were declared

\* See Law Reports, 1887-4, Goldsmid v. Great Eastern Railway Company, and Great Eastern Railway Company v. Goldsmid and Others.



be entitled to hold markets for fruit and vegetables twice a week, without interference. The London County Council recently decided to instruct their Parliamentary Committee to seek legislative authority for the Council to acquire by agreement, or compulsorily, the freehold and other interests in the market. It was represented that the market area is quite inadequate for its existing purposes, and that thereby the ordinary traffic, especially in Commercial-street, is greatly hindered. Thus, it seems, municipal ownership and control will supplant private ownership. The street market is at present held on a site to the west of Christ Church, lying within the confines of Lamb, Red Lion, Brushfield (formerly Union), and Crispin-streets. It is worthy to be noticed that the "Spital-square," named for the market site in some correspondence between Charles II. and the Sheriff of Middlesex, and in the consequent letters patent of July 29, 1682, to John Balch, his heirs and assigns, for a market thereon, is not the place so-called at this day, namely, Spital-square, formerly Spital-yard, in Norton Folgate, the old Lolesworth, or Roman burial-ground, where in 1197 Walter Brune, Sheriff, and his wife, Rohesia, founded a priory and hospital of Christ and St. Mary for canons regular of St. Augustine. It forms part of the ground, in the position we describe above, which was built over for housing the Protestant refugees to England in and after 1685, though that settlement retained the name of "Spital-square" until about 1720. Hatton (1708) cites "Spital-fields Market"; in two maps of 1706 and 1720 the present market space is named "Spital Market" and "Spitalfields Market," respectively. The (old) Mathematical Society removed (1735) from the "Ben Jonson's Head," Pelham-street to Crispin-street, and remained there until 1845, when they made over their books and records to the Royal Astronomical Society.

WE read that this interesting old house is about to be pulled down, for rebuilding, by its recent purchaser. It is situated in St. Ninians, just outside Stirling, close to the field of Bannockburn, and was occupied by General Monk when Cromwell besieged Stirling Castle. The house stands in the midst of some fine old beech and walnut trees, with a beautiful view of the Ochils, and the wide level of fertile land through which winds the Forth. On its front is the date "1629," but the house is believed to have been built long before. Thirty-three years ago Mr. James Morrison, having acquired Western Livelands from the Murrys, made some alterations in the interior of the house, and removed a wooden staircase leading up to the garrets. In doing so he discovered a passage, lighted at the end by a small window. On the sides of the passage—conjectured to have been a secret oratory or chapel—were found paintings of ten Sibyls, for the most part whole and in good state, and beneath them sets of sibylline verses, in black letter and somewhat defaced.\* The property, a portion of which is known as Chapel-croft, is supposed to have appertained to the adjacent convent

of the Black Friars (whose site is now traversed by the railway) which the Lords of Congregation dismantled during the regency of James V.'s widow, Mary of Lorraine, and which was the burial place of the mysterious individual, by some considered to be Richard II., who died in Stirling Castle, in 1419—as is related by Fordun's continuator: the inscription on his tomb has been preserved.

Names of Scotch Architects.  
IN reference to our note last week touching on the difficulty of getting correct information as to the names of deceased architects, an Aberdeen architect writes to us that he must have been misunderstood in regard to the information he gave to a representative of this journal about Gibbs, and that what he stated was that the architect's name was originally and correctly "Gibb," however it might have been altered afterwards. Our correspondent adds—"Gibbs, Watts, and Adams are English names; the characteristic Scotch corresponding names are Gibb, Watt, and Adam"; and he implies that Scotchmen bearing these names assumed the *s*, or had it added to their names, on settling in England; though he admits that Robert Adam was an exception. As bearing on this point, the constant recurrence of the mistake, among English writers on architecture, of referring to Adam as "Adams," seems to suggest that there is a kind of tendency in England to add an *s* to this class of Scotch names. In regard to Gibbs, we find that both in Gwilt and in the Dictionary of Architecture he is given as "James Gibbs," without any hint that the name had ever been differently spelt. However, our correspondent may be right, and at all events we have evidently done him an injustice in attributing to him carelessness or ignorance as to Gibbs's name.

The Salons at the 1900 Exhibition.  
THE Directors both of the Old and New Salons at Paris are much disturbed at the discovery that the Art Palaces for the 1900 Exhibition, in which they will then hold their respective exhibitions, do not offer nearly as much wall space as they have been accustomed to, and that there will be no space for very large works, at all events in any numbers. It seems odd that this should not have been taken account of earlier, and a calculation made of the precise wall space required, though our own opinion would be that the Salons (the "Old Salon" especially) would rather gain than lose by being compelled to somewhat reduce the number of their works and to dispense with the portentously large canvases which they have been in the habit of encouraging. This however is not, of course, their view of the case, and the two opposing Societies intend to make a joint effort to bring pressure to bear on the authorities, with a view of having the accommodation of the new galleries enlarged.

The Advertisement Pest on the Continent.  
ACCORDING to a note in the *Pall Mall Gazette*, the inhabitants both of Germany and France are beginning, like many persons in England, to rebel against the increasing defacement of everything by advertisement. It is complained that the Rhine is becoming a vast advertising medium for German wines; while a leading French journal asserts that unless some order is taken, the line from Marseilles to Dunkerque will soon run

between two rows of hoarding proclaiming the merits of patent foods. It should be encouraging to our own "Society for Checking the Abuses of Public Advertising" to find that there is a strong anti-advertisement feeling getting up on the Continent also; and perhaps Mr. Richardson Evans may be able to see his way to starting branch societies in Germany and France, to co-operate with and extend the influence of his own.

#### ON ARCHITECTURAL INSCRIPTIONS AND INSIGNIA.

IN these days of public improvements of all kinds, of revived interest in architecture, and of the careful study of all artistic details, it is somewhat strange that the subject of architectural inscriptions and insignia has received so little attention, either from public bodies and private persons engaged in building, or those who are the occupiers and users of modern edifices.

Any extended and careful examination of the public and private buildings of London and the provinces will reveal a very great number of sins, both of omission and commission, in this matter, to some of which it is proposed to call attention in the following remarks.

To take the case of omissions first. Would not many of our public buildings be the better for inscriptions and insignia not only signifying their origin and uses, but also giving some indications of their history?

It may, perhaps, be said that it is the duty of the architect to make the purpose and intention of his building at once apparent to the educated eye by means of its style and general form and proportions, without the use of inscriptions and devices; but in these days, when every possible style of architecture is used for every possible purpose, this is very difficult, if not altogether impossible, and a timely inscription or easily comprehended symbolical device would often not only be of service to the ordinary citizen or "man in the street," but might also be an æsthetic addition to the structure itself.

It may here be remarked, in parenthesis, as it were, that until the inscription was recently placed upon its pedestal, the Grinling Gibbons statue of James II. in Whitehall-gardens was popularly supposed to represent Julius Caesar, an idea which the Latinity of the new lettering may perhaps not altogether tend to dispel.

There are, of course, a few buildings which at once proclaim themselves for what they are, without the aid of any inscription; as for instance Newgate, massive, black-browed, and sullen, which, with its frowning and unpierced wall, could not be anything else but a prison; nor, even if it had the Dantean "*Lasciate ogni speranza voi ch'entrate*" over its portal, speak more eloquently of punishment and doom. Then, again, the façade of the Natural History Museum, with its multitude of details ascending in due order from the molluscs of its basement panels to Man himself in adoration on its highest gable, tells at once its purpose to the intelligent spectator. One might even, perhaps, go as far as to say that the gloomy interiors and mazy passages, and rooms, so difficult to find one's way out of, that we find in the Law Courts, are, like Dickens' "fog in the Court of Chancery," eminently typical of the mysteries enshrined. But these and similar instances are much too few and far between, and it is quite possible for the stranger to be in search of some of our public buildings and to pass them by for want of a timely inscription or sign to guide him. It is not in every case necessary that the structure should be broadly labelled after the manner of a scrawl on a schoolboy's slate, with its legend of "This is a church"; and often heraldry or the use of artistic symbolism would be sufficient; as, for instance, in the case of the College of Arms, on the front of which the inscription is almost superfluous in the presence of the wealth of blazonry. There is also the very artistic and characteristic frieze showing the processes of the manufacture of cutlery, which is sufficient by itself to identify for us the Cutlers' Hall in Warwick-lane. This design possibly and probably owes some of its vividness and force to the fact that its designer, Mr. Benjamin Creswick, began life as a working cutler himself in the good town of Sheffield; but we may also see another good example of his artistic craftsmanship in the similar

\* Three of the Sibyls almost exactly correspond with three of the seven depicted in a very rare small quarto volume printed at Frankfurt in 1531: the comparison was made at the time of their discovery.



freeze illustrating the history and mystery of the art of hat making, which we find over the shop of Mr. Henry Heath in Oxford-street. This latter, together with its accompanying Rubens and Gainsborough portraits in their frame of wrought-iron, surely forms a better style of decoration and advertisement than the colossal gilt "topper" that has too often served the purpose in such a situation. It is to be regretted that more inscriptions and insignia like these are not to be seen in our streets, in place of the banalities and enormities that offend the eye in every thoroughfare. Some few examples of the right thing might, of course, be quoted, but still the majority of our buildings, public, business, or private, are either left unrecognisable or spoiled by the over-zealous efforts of the ubiquitous advertiser, to whose sins of commission we may again refer later on.

In the case of public buildings it is often the custom to place under or within their foundation-stones a collection of coins of the realm, presumably for the information and interest of posterity, but as the usefulness of these cannot commence until the destruction of the building, it would perhaps be better to spend the money in providing more information on the outside of the stone which would be of perennial interest, and of service to both the current and future generations. A form of inscription that was more prevalent in the seventeenth and eighteenth centuries than it is now might also be revived with advantage, and that is the dating of private houses of all classes, from the cottage to the mansion, and giving also upon their walls information as to their original owners and builders. The ancient existing examples of this practice have been of the greatest interest and usefulness to the antiquarian and the genealogist, and often also to the student of art; and it is only reasonable to suppose that modern ones of the same kind will be equally so to our descendants in the future. Inscriptions recording rebuilding, alterations, &c., should also be much more frequent than they are, and would help to keep clear the stream of that history which we are all of us, whether we recognise it or not, assisting to make every day, and much of which, like perfection, is made up of things which though apparently trifles in themselves, are yet parts of a concrete whole. In this connexion it may also be remembered that it is often the more humble and comparatively unimportant structures and works of art that last longest, as they are less likely to excite the greed of the spoiler or the prejudice of the iconoclast.

Another form of desirable architectural inscription is that which is made when the architect signs his building in the same manner that a sculptor places his name on the base of his statue, or the painter his autograph in the corner of his picture. This formal signing of buildings is, curiously enough, very rare in this country; which is the more to be wondered at in an age of advertisement and when there are but few men to be found who do not care to receive due credit for their achievements. This rarity surely cannot be caused by our architects being ashamed of the buildings they erect? If so, then the practice of architectural signature would possibly be a salutary one for the advancement of the art itself, and architects would be the more anxious that their works should be worthy of the names appended to them. The public would also know whom to blame in the case of an egregious failure, and whom to acclaim and give further opportunities to in the case of constructive and artistic success. We know of a few cases of deliberately signed buildings, and are tolerably certain that in none of them has the architect had reason to regret his signature.

Having thus considered some inscriptions and insignia as they might be, but are not, we may now turn to some of those which are, but should not be: beginning notice of them with the almost axiomatic dictum that every inscription or device upon a building should, if possible, not only be designed by the original architect, but also form part of the original design, rather than be added as an afterthought. Neglect of this leads to many of the eyesores we so constantly come across, in which we find lettering and insignia sometimes totally out of harmony with their surroundings, and sometimes destroying entirely what was previously perhaps very good. Respecting the first, most of us can probably call to mind Roman lettering on Gothic structures and vice versa, to say nothing of inscriptions placed in in-

appropriate positions, or by their size destroying the scale of the building on which they have been placed by owners too ignorant or too apathetic to get skilled advice on the subject from the original designer of the whole. The instances of utter destruction of artistic effect in this manner occur principally in business premises, where the desire for advertisement overrules all other considerations. Each man tries to outshout his neighbour with colossal inscriptions, until we have great gilt letters 8 and 10 ft. high stretching across our street frontages, to the entire concealment of architectural details on which perhaps the very persons who cover them up thus ruthlessly have spent many hundreds of pounds. It may be doubted whether these enormities benefit business at all, while their cost is large, and they are a standing offence to the educated class which is happily growing larger every day. If these glaring advertisements are, however, of any benefit to their producers, they might be at least confined to their more legitimate place on the ephemeral hoardings, and not be allowed to detract from permanent architectural beauties.

We are always calling upon our architects to give us better and more beautiful buildings, but we can hardly expect any man to put the whole of his mind and skill into work that stands such a good chance of being thus ruined and disfigured as soon as it is exhibited to the public gaze. What sort of works would our painters be likely to send to Burlington House if, when the galleries were opened, it was found that the public could only see them through a grille of lettering announcing the merits of the last new brands of soap and pills? What are the feelings of the architect when he sees, as he does daily, his work thus treated may be better imagined than described.

The hideous "sky-signs," set up to shut, if possible, a little more of the broad light of Heaven from out of our crowded streets, we have of late years somewhat abated, but alas! only to replace them with the fresh horrors of the electric "winking" signs which make night hideous, and the spectator almost delirious as he waits yet once again for that to dot itself as the long dash spreads, comet-like, beneath the barbaric word!

#### PROGRESS IN SEWAGE PURIFICATION.\*

From time to time the world is startled by the announcement that some wonderful discovery has been made which is calculated to revolutionise existing methods of manufacture, to open up new industries, or to afford facilities hitherto unobtainable for achieving some desirable result. It often happens, after the first burst of applause has died away, some critic comes forward to question either the value or the originality of the alleged discovery. While we should be careful not to disparage the labours of those who have achieved success in a field of research in which others have toiled without any apparent result, we are quite entitled to satisfy ourselves that if praise be accorded it is well merited, and that the alleged discovery is really a step in advance which will promote the cause of science or the well-being of the community.

We have heard a great deal within the last year or two about the advances which have been made in sewage purification, and it is, therefore, well worth considering in what these advances really consist, and by whose labours and researches they have been brought about.

At the Congress of the Sanitary Institute at Leeds in 1897 one of the papers read on the subject of sewage purification included a description of the circular deep tanks in use in Dortmund in Germany, and the author of the paper distributed lithographed copies of the drawing of these tanks to the audience, apparently under the impression that they were a novelty. All engineers who are conversant with the literature of sewage purification were aware that these tanks had been fully described in Mr. Santo Crimp's admirable work on sewage disposal works, published in 1890, and that they were no longer a novelty; but comparatively few persons are aware that even before these tanks had been either designed or

constructed the same principle had been applied to the clarification of sewage.

In May, 1885, Mr. W. H. Hartland, of Glasgow, took out a patent for the purification of water and sewage, which embraces amongst other features a type of tank which embodies in the same principle as the Dortmund tank. In the words of the patentee, "the process consists mainly of settlement, but under somewhat peculiar conditions, or what I will term equilibric subsidence, under which the full effect of the laws of gravity may be obtained in freeing a liquid from suspended impurity." The form of tank which Mr. Hartland patented differs from that used at Dortmund. He used a rectangular tank sunk to a considerable depth below the level of the sewer invert. This tank was provided with two vertical shafts or pipes fixed at the opposite ends, and carried up to the level of the sewer invert. The tank was worked continuously, and owing to the depth to which it was sunk, the liquid in it was under pressure resulting from the head of water in the vertical pipes. The sewage flowed down one of the vertical pipes into the tank, and, after passing along its entire length, it again flowed up to the surface by the second pipe, passing out of the tank at the same level as it entered it, while the sludge was periodically drawn off from the bottom. But in both the Hartland and the Dortmund tanks the principle is identical: that is to say, the liquid containing the suspended matter is first made to flow in a downward direction to a considerable depth, and before it can escape it is compelled to rise again to the original level, leaving behind it the finely-divided particles of suspended matter, which will not rise with the liquid.

In the year 1887 the author of this paper made the acquaintance of Mr. Hartland, and by arrangement with the latter a trial apparatus, having model tanks constructed in accordance with Hartland's patents, was erected in Kingstown, County Dublin, and a series of practical tests was undertaken by the author. These experiments were described in a paper read before the Institution of the Civil Engineers of Ireland on December 5, 1888, and the paper will be found in the "Transactions" of the Institution.

When the author read the description of the Dortmund tanks in Mr. Santo Crimp's work he at once recognised their value from his own experience of the results arrived at by the Hartland tanks, and as the form of tank used at Dortmund was somewhat more simple than that adopted by Hartland, while the principle of both was identical, the author constructed Dortmund tanks for the sewage purification works at Dundrum, which were designed in 1891, and described at the Congress of the Royal Institute of Public Health, held in Dublin in 1892. The paper will be found in the "Journal of State Medicine," vol. 1, October, 1892. When, therefore, in 1897 this principle was put forward as a new departure in sewage treatment it was, as a matter of fact, more than twelve years old. It would be wise for all those who take up the question of sewage purification to make themselves conversant with its history. If they were to do so, they would find that there were clever chemists and able engineers engaged upon this problem when many of us were still in our cradles, and that, although they did not recognise the labours of aerobic organisms as giving us a true explanation of the action which takes place in a filter, they had a very practical acquaintance, not only with the difficulties of the sewage question, but with the lines upon which it would be possible to deal with it successfully. Take, for example, the valuable series of Reports published by the late Dr. Angus Smith. How many of our more modern chemists take the trouble to peruse them in order to study his experiments on aeration?

But in the present short paper the writer desires to allude more particularly to the labours and the writings of the late Mr. Bailey Denton, whose first work on land drainage was published in the year 1854, and who from that time until his death contributed a series of most valuable additions to the literature of sewage treatment. Nor were his exertions confined to literary productions, for as all engineers know he designed and carried out a great number of extensive sewage disposal works, to the principles underlying which the writer desires particularly to draw attention. In 1880 a brochure appeared from the pen of Mr. Bailey Denton, entitled "Ten Years' Experience in Works of Intermittent Downward

\* A paper read by Mr. W. Kaye Barry, M.A., A.M.Inst.C.E., at the Dublin Congress of the Royal Institute of Public Health (Engineering and Building Construction Section).



Filtration." This little book is worthy of more attention than it has received at the hands of some recent writers.

At present we are expected to accept the so-called bacterial filters as the real solution of the sewage problem. We cannot take up a professional journal without hearing something about them, and about those who are trumpeting forth their virtues, and who claim credit for having originated them. Time alone can show whether these filters really constitute the best and most economical means of purifying sewage. Into this controversy the writer does not at present intend to enter; but it is worth while to stop and ask whether these bacterial filters are really new, and in what respect do they differ essentially from the land filters the use of which Mr. Bailey Denton advocated. The latter selected land of an open porous character; he prepared the surface carefully, and divided it up into a number of plots; each plot was surrounded by a bank, and was as level as a croquet ground or a lawn-tennis court. These plots were then carefully and thoroughly underdrained to a depth of 6 ft. by a series of herring-bone drains connected with a central drain by which the filtrate was conveyed away. The sewage was turned on to each plot alternately, and it was allowed to filter through the porous land until it reached the under drains; each plot was allowed an interval of rest after it had been working for a certain number of hours. According to Mr. Bailey Denton's own words, the process was one of filtration in a downward direction carried on intermittently. It is most important to remember that he lays the greatest stress on the absolute necessity for the intervals of rest.

He writes as follows: "In speaking of intermittent filtration . . . I refer to the concentration of sewage, at regular intervals, on as few acres of land as will absorb and cleanse it without preventing the production of vegetation."

In the process just described, the land after being levelled was ploughed, so as to make a series of ridges and furrows, the sewage flowed along the furrows and the crops were planted in the ridges. All these works were the outcome of the researches of Dr. Frankland, who had reported that "an acre of suitably constituted soil, well and deeply underdrained, with its surface levelled and divided into four equal plots, each of which in succession would receive the sewage of six hours, would cleanse the sewage of 3,300 persons."

These words were written in 1870, and Mr. Bailey Denton promptly put these theories to the test, and in 1880 he was able to give the world his experience and to show that substantially Dr. Frankland was absolutely correct, for although, as a matter of precaution, he very wisely kept on the safe side by preparing land enough to enable him to allow an acre of land to every 1,100 persons, instead of 3,300, yet he states distinctly "although he had acted thus cautiously in designing the first work of the kind, there was no intention to discredit the conclusions come to by the Rivers Pollution Commissioners as to the cleansing capacity of suitably constituted soil," and the evidence submitted in his book fully bears out Dr. Frankland's views. Thus, in 1870, although bacteriology as applied to sewage treatment was an unborn science, and no one had ever heard of the benevolent bacillus, yet sewage was successfully purified on exactly the same lines as those the merits of which are now so loudly proclaimed.

In 1887, the author, following Mr. Bailey Denton, laid out three acres of land on Dr. Frankland's principles for the purification of the sewage of the Rathdown Union Workhouse, at Loughlinstown, Co. Dublin; these plans were approved of by the Chief Engineering Inspector of the Local Government Board for Ireland, Mr. Charles P. Cotton, who is now presiding over this Section. These works were described by the writer at a meeting of the Institution of Civil Engineers of Ireland in April, 1892. The land was divided into plots, levelled and underdrained, as recommended by Dr. Frankland, and the sewage of the workhouse has been filtered through these filters ever since.

These filters have been in use for the last ten years, so that the writer can now adopt Mr. Bailey Denton's language, and write of his ten years' experience of intermittent downward filtration, and, from a recent visit, he is pleased to be able to state that the filters are still giving satisfaction and producing an effluent which can safely be discharged into the river.

No doubt, modern artificial filters are capable of dealing with a larger volume of sewage than the land filters; but, on the other hand, they will not grow crops, whereas Mr. Bailey Denton aimed at "cleansing the sewage without preventing the production of vegetation."

As regards the relative cost, Mr. Dibdin tells us that the cost of making a burnt clay filter at Sutton, with an area of one-tenth of an acre, was "less than 100l." So that the cost of preparing one acre of land for the purpose would in this case have been about 1,000l., exclusive of the purchase of the land. But Mr. Santo Crimp informs us in his paper on the Main Drainage of London that the bacterial filter, about one acre in extent, constructed at Barking, cost about 2,000l.; the breeze and cinders being acquired on exceptionally favourable terms. Mr. de Courcy Meade tells us that he estimates that the cost of constructing bacterial filters for Manchester would be at the rate of 5,500l. per acre, exclusive of the purchase of the land. Mr. Bailey Denton states that the total cost of preparing forty acres of land at Merthyr Tydfil for intermittent downward filtration, including under drains, surface formation, construction of tanks and conduits, distributing chambers, roads, fencing, engineer's fees, and clerk of works, was 3,300l., which is equal to 82l. 10s. per acre.

Now, according to Dr. Frankland, one acre of suitable land thus prepared would take the sewage of 3,300 persons, and this may be put down at 132,000 gallons a day, whereas, according to Mr. Dibdin, the artificial filter of one acre would deal successfully with 1,000,000 gallons per day, but Mr. de Courcy Meade only allowed 600,000 gallons to the acre. That is to say, following Mr. Dibdin's figures, an artificial filter of one acre is more effective than a land filter in the ratio of 1 to 7.57. If therefore we multiply 82l. 10s. by 7.57 we find that the cost of preparing land to deal with 1,000,000 gallons a day would be 624l. 10s. 6d. against 1,000l. for an acre of artificial filter according to Mr. Dibdin's figures for Sutton, or 2,000l. according to Mr. Santo Crimp's figures for Barking, or 9,166l. according to Mr. de Courcy Meade's estimate for Manchester. These figures are instructive, and throw a side light on the progress of sewage purification since 1870.

But if sewage purification by filtration be not a novelty, the writer ventures to state that successful sewage purification without filtration either through land or artificial filters is absolutely a new departure, and those who have any doubt as to the practicability of these methods are invited to visit the Criminal Lunatic Asylum at Dundrum, Co. Dublin, or the Metropolitan Police Barracks, Chapelizod, Co. Dublin.

#### BUILDERS' ACCIDENT INSURANCE, LIMITED.

The seventeenth annual general meeting of this company was held at the offices, 31 and 32, Bedford-street, Strand, W.C., on the 24th ult. Mr. Stanley G. Bird occupied the chair. The notice calling the meeting having been taken as read, the Secretary, Mr. R. S. Henshaw, read the minutes of the last general meeting, which were confirmed. The report and statement of accounts having been taken as read,

The Chairman said he had great pleasure in moving the adoption of the report. They had just ended a cycle of the life of the company, because on July 1 the Workmen's Compensation Act came into operation, and the business of the company would now be carried on in a totally different way, under different circumstances, and at a very different rate. With regard to the first clause of the report, it stated that "whilst the expenses have been slightly reduced, the premium income has been largely increased." He thought they would agree that that was a very satisfactory report to make—that the business had increased, notwithstanding very adverse circumstances. They had had a very sensible increase in the premium income of the company to the extent of about 1,700l. That showed at all events that there was vitality and life in the company, and that the staff, officers, and agents had done their best to make the company a success. The working expenses of the company had been slightly reduced, and that notwithstanding the increase in the amount of the premiums. They considered that the working expenses were a very important item in the company, and it was their opinion that no company could possibly be worked at less cost; and when he told them that the percentage

on the income of the company was only about 16 per cent., he thought they would agree that no company could possibly be worked at less than that. He hoped, however, that in the future, with the increase of business and the increase of premiums under the new rate, that the percentage of working expenses would be even less than at present. He believed that the ordinary rate for working expenses in an ordinary life insurance company generally amounted to about 25 or 30 per cent., and, therefore, if they could get anything under that they could congratulate themselves and consider that they were working at the very minimum of cost. During the year they had had a great many more accidents, and the claims had been proportionately large. There were several causes for that. One cause was that the trades-unions in the south had, perhaps, in other respects, been more quiet than had been usual with them for some years, and having little to do they had directed their attention more particularly to worrying the Builders' Accident Insurance instead of devoting themselves to what would probably be more in the interests of their workmen and their own clients. Then with regard to the working of the Compensation Act: no doubt during the last six months or more, owing to the knowledge that this Bill was coming into operation very soon, a great effect had been made on judges, juries, and lawyers. The result had been that since July 1 there had been a great many more claims to settle than if the old Act had remained in force. Possibly all insurance companies had cycles of good or bad luck, and it might simply have been the misfortune of the company that they had had during the past year more accidents than in former years. At all events, the net result of all this had been that they had ended the year 1898, up to May 31, 2,000l. worse than they were before. He was quite sure that their opponents would make capital out of that and point out that they had been working at a loss; but it must not be forgotten that for the last three or four years it had been in contemplation that they should increase the rate of 4s., because they had known perfectly well that the 4s. rate had not paid. The only question was whether they should increase the rate from 4s. to 5s., or whether, knowing that they had a reserve of 5,000l., they should have recourse to the reserve and take any slight losses they might have from that. As to the reserve, their opponents tried to do as much damage as they could by telling everybody that the company had no reserve, and that it was in a state of bankruptcy. He was not sure that any mutual company or any company working on mutual principles as they were ought to have a large reserve. He could not see the justice of taking money out of their pockets to-day to provide for somebody next year, or two, three, or four years hence. He would remind them of one point with reference to that. In the earlier stage of the company seventeen years ago, the rate was 6s. 6d., and it was very much too high, and at one time they created a reserve of some 8,000l. The rate of 6s. 6d. was ultimately reduced to 4s. That reserve had stood them in very good stead for many years, and it was that reserve that they had been entrenching upon this year to make up for the deficiencies. Really the true object of mutuality in a company would be to divide the surplus every year, but that could not be done. Still if they had a surplus say next year or in any future year, after providing a sensible sum for reserve, he would suggest that they should divide the money in the shape of a bonus. He was sorry to have to say it, but it was a fact that some of their opponents had made very unfair attacks upon them. No doubt some of the other companies were a little angry because there was no question but that they launched out at the beginning of this agitation into a new line of business about which they knew nothing; they had no information about it, and they launched out into it and asked a most exorbitant rate; they asked as much as two guineas and three guineas per cent. The Builders' Accident Insurance based their rate at 15s., and it was a very odd thing that the other companies had come down to that rate. There was no doubt that the large capitalised companies which boasted so much of having such an immense sum behind them really meant to victimise the Builders' Company and make them pay this two guineas; and it was only by the stand the company took up that they were able to convince builders generally that 15s. was quite enough.



They had increased already during July the number of insurers by nearly 50 per cent, and the income of the company for the workmen's risk had now more than quadrupled. The accidents which had been reported from July 1 to July 20 had doubled those of the previous year; but on the other hand the premiums had increased in a greater proportion. Although they had had this increase in the number of accidents he did not think the claims were likely to increase very much, because under the new Act for the first fourteen days no claim could be made; and as many of these were of the very slightest character—many merely cuts and bruises—and so on, he did not think they were likely to bear more of them. They had had three deaths since the Act came into operation, and they had had one total disablement. A poor man fell a distance of only about 8 ft., but he broke his spine, and therefore that would be a case of total disablement. The remuneration of the directors for their services during the past year would be left to the General Meeting. The work had been very much heavier this year than before, and he thought it would tend to become more heavy. There were three returning directors, Mr. John M. Burt, Alderman Brown and Mr. F. J. Dove, and those three gentlemen were all eligible, and offered themselves for re-election. It had been proposed that the number of the representatives on the Board should be increased; that was a most difficult matter for the directors to come to any decision upon. The first name recommended was that of Mr. Thomas Barnsley of Birmingham, and the other names were Mr. A. Krauss, of Bristol; Mr. Wm. Nicholson, of Leeds; Mr. Woodman Hill, of Gosport; and Mr. Geo. Haward Trollope, of London. They should be very glad to increase the number at some later time when they got other names before them. He thought the company had a great future before it. They had not exhausted all the trade yet in trying to get members to join the company. They had been very successful up to the present time, and he was glad to see that they had had a very great deal of success in the North of England through the instrumentality of Mr. Tomlison, the Secretary of the Lancashire and Cheshire Federation, and Mr. Bowden of the Potteries. A great deal depended upon the way that the company treated their insurers. He believed that it was the general opinion throughout the trade that the company had treated well all cases that came before it.

Mr. Mansfield seconded the motion.

In reply to Mr. Saprote, the Chairman said that each year the stock had been taken at the then value to May 31. Unfortunately on May 31, 1897, it stood at a higher figure than it did at present. Therefore, on May 31, 1898, they really effected a loss. They had taken it at the market value of the day, and that really accounted for it.

Mr. Alderman Bowen, Mr. W. H. Lascelles, Mr. Goslett, and other members having joined in the discussion, the Chairman then put to the meeting the motion "That the report and balance-sheet be received and adopted," and it was carried unanimously.

The retiring directors having been re-elected, Mr. Barnsley, of Birmingham; Mr. Woodman Hill, of Gosport; Mr. A. Krauss, of Bristol; Mr. W. Nicholson, of Leeds; Mr. G. Haward Trollope, of London, were elected directors of the company.

On the motion of the Chairman, it was resolved that in future the accounts be made up to December 31 in each year.

It was resolved that the remuneration of the directors for the past year be the same as previously paid them, namely, 400l.

It was proposed by Mr. John Greenwood (London), seconded by Mr. Hanson, and resolved, that a cordial vote of thanks be tendered to the Chairman for his services during the past year.

The Chairman having replied, the meeting terminated.

**CHURCH SCHOOLS, AMBLE, NORTHUMBERLAND.**—The memorial stone of the first section of the Amble Church of England (Medd Memorial) Schools was laid on the 24th ult. The site of the new structure is in Dovecot-street. The entire block will accommodate 800 scholars, and the section commenced will seat about 320. It will be used as a mixed school, and the existing building as an infant school. The class-room system has been adopted. The contract for the work has been let to Messrs. R. Carse & Sons, the architect being Mr. J. Wightman Douglas, of Alnwick.



Sketches of London Street Architecture. No. XXVIII. 13, Bramham Gardens, S.W.

#### HOUSE, No. 13, BRAMHAM GARDENS, S.W.

This house, the sketch of which forms No. XXVIII. in our series of sketches of London Street architecture, has a front of brick and terra-cotta in the modern "Free Classic" style, with a bold treatment of the large corbels carrying the balcony.

The present owners of the house can give us no information as to the name of the architect, which we are unable to add.

**BOARD SCHOOL, WESTBURY PARK, BRISTOL.**—The new Board School at Westbury Park was opened on the 22nd ult. The buildings of the school are the first instalment of what will probably be a large school, and are therefore arranged with a view to extension. They comprise a central hall, two class-rooms, each for fifty children, and a babies' room for fifty. An octagonal teachers' room has a lavatory adjoining, and there are a large cloak-room and lavatory for the children, and a room for the use of the caretaker. The whole building is heated by hot water, but the hall and class-rooms have also fireplaces of glazed faience; the exterior is treated in red brick. The architects are Messrs. La Trobe & Weston.

#### THE TRADES-UNION CONGRESS.

The thirty-first annual Trades-union Congress opened at Bristol on Monday, when about 420 delegates, representing 1,200,000 members, were present. Mr. Wilkie, of Newcastle, Chairman of the Parliamentary Committee, presided.

Mr. Wilkie, in welcoming the delegates, spoke of the advance which trades-unionism had made in the last twenty years. Trades-unionism was bound to extend and prosper, and every struggle it had to make tended to strengthen its hold on the nation.

The Mayor of Bristol also welcomed the delegates.

Mr. J. O'Grady, of Bristol, having been elected President of the Congress.

Mr. Woods, M.P., Secretary, read the report of the Parliamentary Committee, and later in the day the delegates paid a visit to Weston-super-Mare.

From the report of the Parliamentary Committee we make the following extracts:—

"In presenting our thirty-first annual report we have to state that many matters of great importance have occurred during the year, which are significant and of deep interest to



the industrial classes of the country; and while we cannot boast of the successful passing of any prominent legislative measure directly promoted by the Congress, yet we have had interpretations of the law given in the courts of justice which are of especial import to trades-unions, and there are other questions still pending affecting the labour laws, waiting final decision, which cannot be settled until the early part of next year. . . . Early in October, immediately after the last Congress, the Parliamentary Committee, as is their usual custom, met and went through the resolutions passed at Birmingham, specially dealing with those which contained instructions directing them to promote and support legislation, with the following results:— 'The Employers' Liability Amendment Bill' was entrusted to Mr. Burns, 'The General Eight Hours Bill' to Mr. Burns, 'The Factory and Workshops Amendment Bill' to Mr. Dalziel, 'The Truck Act Amendment Bill' to Mr. Broadhurst, 'The Foreign Ships and Compensation Bill' to Mr. Reckitt, 'The Railway Fatalities Bill' to Mr. Channing, 'The Bakers Eight Hours Bill' to Mr. Woods, 'The Steam Engine and Boilers Persons in Charge Bill' to Mr. Samuel, 'The Boilers Registration Bill' to Mr. Fenwick, 'The Watermen's Certificate Bill' to Mr. Steadman, 'The Watermen's and Lightermen's Act Amendment' and 'The Workmen's Cheap Trains Bill' to Mr. Woods. Your secretary also has his name on the back of two other important Bills, first, 'The Workmen's Compensation Amendment Bill' (having for its object the extension of the provisions of the Compensation Act, 1897, to the injuries to health and loss of life suffered by persons employed in certain dangerous occupations), and the other 'An Amendment to the Truck Acts' having for its object the preventing of any contract with any workman whereby he is compelled to cease being a member of any club or other friendly society). . . . Your committee, in their report to the Birmingham Congress, referred to certain cases pending under the Law of Conspiracy Act, 1875 (Picketing Clauses). Since that time decisions have been given in the law courts, and by the House of Lords, on two of the most important of these cases, viz., *Allen v. Flood* and *Lyons v. Wilkins*. The first of these cases came before the law lords in the House of Lords on December 14, 1897, and after a very elaborate and long discussion they decided, by a majority of seven to three, that the principle for which the workmen contended was upheld, viz., the right of workmen to decide with whom they should work. This decision is all the more remarkable, because it upset a previous decision in the Court of Appeal in December, 1895, wherein six judges against two gave a contrary opinion. It is impossible to over-estimate the value of this latter decision to trades-unions, and it marks an important turning point in a great industrial controversy, especially as in the latter years attacks on trades-unions have been pressed forward with such dangerous energy by the uninstructed enemies of capital who are always to be found in the legal profession. It is unnecessary to go further into details of this case, as your committee has issued, in pamphlet form, all the legal arguments set forth in the discussion, and such pamphlet has been sent out to the trades. The next case, *Lyons v. Wilkins*, stands rather in a different position. This case has been pending now for over two years, during which time it has been heard in both the lower and the higher Courts. It will be remembered that there was a strike in which the Fancy Leather Workers' Society found themselves in conflict with a firm of leather bag makers in Redcross-street, London. Certain of the officers of the union were said to have been, by themselves or their agents, watching or besetting the plaintiffs' works for the purpose of persuading persons from working for them. The plaintiffs claimed an injunction to restrain the Society from doing this, which, broadly speaking, was directed against the right of picketing, which has been practised without molestation for many years, and also to restrain the Society from writing and publishing certain letters, which were claimed to be libellous, as to the plaintiffs' mode of conducting their business. In respect to these letters Mr. Justice Byrne held that they were libellous, and awarded £1 damages in respect thereof; upon the remaining points of watching and besetting, which is of considerable importance to trades-unions generally, Justice Byrne has decided that the law of picketing, as it has been

practised for many years, is undoubtedly illegal, and, further, is a criminal act. The fancy leather workers have given notice of appeal in consequence of this unsatisfactory decision. In respect to the present and future position of this case, your committee, after full consideration, although they could take no financial responsibility, agreed to render what help they could by recommending their case to the trades-unions composing the Congress. . . . On July 1 the Workmen's Compensation Act came into operation, and although many cases have arisen in the different branches of industry in regard to the subject, it is too early to express a definite opinion as to the practical applicability of the measure. Your committee, through their secretary, have placed themselves in communication with Mr. Edmund Browne, barrister-at-law and member of the L.C.C., with a view of drafting a Bill dealing with the defects of the Workmen's Compensation Act, many of which were pointed out in the committee's last report to the Birmingham Congress. It is unnecessary to state that Mr. Browne at once kindly consented to draw up such a Bill, and he has placed the proposed Bill in the hands of your committee, who during last week fully considered its proposals, and a statement will be laid before this Congress on the subject. Trades are requested to forward to the Parliamentary Committee full particulars of all cases decided under this Act.

On Tuesday the second session was held in the Colston Hall, when the chair was taken by Mr. James O'Grady, the newly-elected President, who delivered his Presidential address. Commenting on the national character of their work from a political and Parliamentary point of view, the past twelve months, he said, had been barren, and he could not help thinking that something must be done to free their industrial conditions from the blinding shame and disgrace that was attached to the half-time system and child labour generally. That question had reached the importance of being one of national concern, as to which there was need of immediate and drastic reform. July 1 witnessed the coming into operation of one of the most revolutionary of the laws relating to labour that the century had yet given birth to. While fully recognising the meagreness of the Workmen's Compensation Act, he, as a workman, accepted it because it contained the germ for a more complete measure in the future. It had met with a storm of disapproval from both employers and employed. The former prophesied all sorts of evil effects to industry from the operations of the Act, but he did not sympathise with those predictions. If the Act only succeeded in lessening to a small degree the number of workmen injured and killed, then it had justified its existence on the Statute-book. The objections of the workers were—first, that the Act was not comprehensive enough; that it should embrace, not a dozen or more, but all trades. That being so, it only required agitation to get the principle of the Act extended. Secondly, it was said it would damage the existence and prosperity of the great friendly societies. He believed it would, and that seriously, but that should not alarm them. While testifying to the good work they had done, he could not conceal from himself the fact that they were usurping the functions of the State. If it was logical for the State to interfere to reduce the hours of labour, and to insist that special regard should be paid to the safety of life and limb, on the ground that the national prosperity depended on the well-being of the worker, the necessary corollary was that the State should care for him in times of sickness, in order that his productive powers might again be at the disposal of the nation. Thirdly, it was contended that preference of employment would be given to young men, with whom the risks of accidents were less than with the more aged. He should be glad if the effect of the Act were so, for who ought to work but the young and strong, and who were entitled to rest if not the old and weak? If these results were to come from the operation of the Act, then the ideal of pensions for old age would be advanced a considerable step nearer realisation. The fourth objection, and from the trades-union point of view, the strongest, was that the Act allowed contracting out. He believed, however, that just as the principle of common employment was found to be bad, so the principle of contracting out would be found to be immoral, because it tended to render direct legislation largely inoperative, thus defeating the ends of

justice. Taking the Act as a whole, however, and seeing that it had in it the promise of being the most useful and beneficial of the laws relating to labour; that it had asserted the right of the State to interfere in industrial matters where the conditions of safety were loose; and, above all, that it had practically abolished the principle of common employment—taking these points into consideration, he thought they had something to rejoice over, and ought to be prepared to give the Act a fair and impartial trial.

The recent engineers' dispute had demonstrated the absolute futility of attempting to gain any considerable reduction in hours of labour by trades-union action alone. Again, it had taught them that the time for isolated fighting had departed. In the future no individual union could hope to achieve success against the combinations of capital. If trades-unionism was to continue to be the power that it had been in the past, it would not be by the old methods of defence or attack, but by perfecting their organisations, and welding them into a solid unity, giving them a national spirit and aim, so that under present conditions there might be a conscious working towards achieving immediate results. Therefore, he sincerely hoped the Congress would not break up until it had adopted the basis of some scheme of trade federation. Then, with co-operation and trades-unionism running together, the two mighty weapons of Democracy might be intelligently used to work out their industrial and political emancipation. What he wished them to recognise was the trend of modern industry. Its drift, although unconscious so far as its own world of capital was concerned, was distinctly towards collectivism, and if trades-unionism was to hold its own as a fighting force against the unconscious tendency of capital, it must do consciously what capital was doing unconsciously. In other words, to make the issue clear and distinct; to give order, method, and a national aim and spirit to their movement; to make every step forward secure; to prevent striking in the dark, lest, after months of fighting, they found a false move had been made. Above all, if they desired to make trades-unionism that intellectual force in industrial politics and social matters to which its importance entitled it, they must declare that it had an objective. Having agreed, then, that that was collectivism, they must use every agency at hand, industrial and political, to work consciously towards that goal. After the legal eight hours day and the extension of the Workmen's Compensation Act to all trades had been achieved, the most important item was the question of land reform. He advocated the taxation of land values, the nationalisation of mining royalties, mineral rents, and way leaves, and the nationalisation of railways. These were matters of supreme importance, not only to the workers, but to all classes of the community. Their political programme also must include payment of members and election expenses, a second ballot, universal suffrage, one man one vote, and a three months' qualification. The only question that remained to be dealt with was, if possible for trades-unionists to agree (given agreement on the programme) as to the methods of procedure. That had in the main been the rock on which the political barque of trade unionism had repeatedly been wrecked. His own opinion was that a scheme for political action for translating their ideas respecting industry into the Statute-books of the nation was possible and practical, but it was only possible or practical by keeping themselves separate and having an identity quite distinct from existing political associations. He did not wish it to be understood that such a position would of necessity force them into opposition to all sections of political thought. On the contrary, he fully believed that the trades-union movement, with its powerful organisation, well drilled and disciplined, would be the comprehensive channel through which the progressive thought of all sections of the community could be best expressed. Now, assuming that the Congress were determined to adopt some scheme, or basis of a scheme, of Trades Federation, he sincerely hoped that another committee would be appointed to draft a scheme of political organisation, so that this might become a burning question at future Congresses, on the ground that just as Trades Federation was a matter of vital necessity to our industrial organisations, so also would a scheme of political action be of vital necessity if they wished Parliament to faithfully register the effect of



the industrial revolution on our social life. He suggested, then, that such a committee should consider a scheme which appeared in the *Westminster Review* in December, 1897, under the heading of "Hardy Annals at Trades Union Congress." The writer calculated that a subscription of one penny per week from Trades Unionists would amount in round figures to 224,000l. in one year, and in four years, when the life of the present Parliament would be nearing its close, the fund would amount to 896,000l. With that sum they could, if need be, threaten every seat in the Kingdom.

Mr. G. Hodge (Manchester) moved a vote of thanks to the President for his address. This was seconded by Mr. Sexton (Liverpool) and agreed to.

The Congress then proceeded to consider the Report of the Parliamentary Committee.

Mr. Steadman moved—"That this Congress deplores the omission in the Parliamentary Committee's Report of any reference to the numerous deaths arising from phossy jaw and lead poisoning, and strongly urges upon the Home Secretary the necessity of introducing legislation at the earliest opportunity in order to deal with this question."

The President: That is out of order. It is a distinct amendment. If you will leave the matter to Mr. Wilkie and the secretary, they will insert a clause embodying your views.

The report, after a vote by card had been challenged by Mr. Sexton (Liverpool), was then carried by 744,000 against 220,000.

Mr. Gray, representing the Co-operative Union, Limited, then addressed the Congress, dwelling on the importance of the relations between Trades Unionism and Co-operation.

The delegates subsequently proceeded to the consideration of the resolutions submitted by the Parliamentary Committee.

Mr. Bowerman (London) moved, Mr. Parnell (London) seconded, and it was unanimously agreed to instruct the Parliamentary Committee to take immediate steps to secure an alteration of the Conspiracy Acts, and to introduce a Bill having for its object the reform of the jury system, co-operation, and trades unionism.

Mr. Inskip (Leicester) moved, and Mr. Gibbs (London) seconded, a resolution in favour of closer relations between co-operators and trade unionists.

Mr. Macpherson (London) said a great deal of improvement was to be desired in regard to some co-operative societies, both as to the conditions of employment and the rates of remuneration. The resolution was adopted.

Mr. D. Holmes (Burnley) moved, and Mr. Sexton (Liverpool) seconded, a resolution dealing with the taxation of ground values. After some discussion, the following amendment, moved by Mr. Sharland (Bristol), was accepted and carried as a substantive motion:—"That the present incidence of taxation and rating is unjust, inasmuch as it exempts from national and local burdens the ground values which are created by the presence, the industry, and the expenditure of the whole community, and that the Parliamentary Committee be instructed to prepare a Bill providing for the separate valuation of land and improvements, and for the assessment of taxation and rates upon the full true yearly value of the land, whether used or not."

An amendment, moved by Mr. Will Thorne (London), proposed that the money realised by the taxation should be ear-marked for purposes of technical education, free libraries, baths and washhouses, and the erection of artisans' dwellings, was defeated.

On the motion of Mr. Mullin (Manchester), seconded by Mr. Cross (Blackburn), a resolution calling for further amendment of the Factory Act was carried.

Mr. Wilkie (Newcastle) moved a resolution recognising the importance of the new Workmen's Compensation Act, regretting its limited application, and expressing the opinion that no Act would be satisfactory which did not provide for compensation for all workers, both on land and sea.

The Parliamentary Committee were instructed to introduce a Bill next Session providing for the abolition of contracting out and the principle of common employment.

Resolutions were passed in favour of the more thorough carrying out of the "Fair Wages Resolution" of the House of Commons, and the payment of members.

Mr. W. Thorne (London) moved, and Mr. Mitchell (Glasgow) seconded a resolution in favour of a legal general eight hours' working day; the discussion was adjourned until

Wednesday, when the debate on Mr. Thorne's motion in favour of a legal eight-hour day was resumed by Mr. Paul Vogel, the secretary of the Waiters' Union, and the motion was carried with only a few dissentients.

The congress subsequently considered the resolutions sent up from the trades. The first five resolutions all dealt with fair wages, but they were amalgamated into one, which was moved by Mr. Mosses, of the Pattern Makers, and seconded by Mr. Fox, of the Boiler Makers. The resolution was adopted.

The consideration of the question of Trades Federation was deferred until Thursday.

Colston Hall, where the sittings of the Congress have been taking place, has been the scene of a destructive fire. The special correspondent of the Press Association says that shortly after two o'clock on Thursday morning it was discovered that the premises of Messrs. R. Clark & Co., clothiers, Colston-street, were on fire, and before the brigade could be summoned the flames in great volumes were pouring through the top and through the roof. Next the roof of the Colston Hall began to burn. At half-past three some 20 yards of the roof immediately above the organ were burning fiercely, and plaster, charred wood, and streams of water were falling upon the grand organ, which is to all intents and purposes destroyed. In spite of the efforts of the police, the whole of the large hall was involved. The roof has fallen in, and nothing remains of the Hall in which the Congress met but bare walls. Colston Hall was built in 1870 on the site of the Carmelite Friary, afterwards known as the Great House and then as Colston's School. It contained, besides the large hall, 80 ft. wide and 70 ft. high, capable of accommodating 2,250 persons in the body and galleries, and 400 additional in the balconies or orchestra, two other halls, one with sitting accommodation for 700, and the other on the ground floor for 400. Colston Hall was designed by Mr. Foster.

## Illustrations.

### THE GUILDHALL, CAMBRIDGE.

THE proposed new buildings for the Cambridge Guildhall have not yet been commenced; but it is hoped the building may be started as soon as possession is obtained of the property necessary to furnish the complete site.

The hall, courts, and free library are completed, and the proposed additions will form suitable approaches, and the accommodation for the municipal offices which is now lacking.

The new buildings, as arranged, are on the frontages laid down by the Borough Surveyor, and will occupy one side of the fine Market-place.

The remarkable examples of the Later Renaissance architecture already possessed by the University city have led to the adoption of this period for the new Guildhall, and it affords opportunities for marking the importance of the municipality in its relation to the University.

The cost of the work is estimated at 38,000l., a comparatively small sum for a work of this extent and importance.

Mr. J. Belcher is the architect. The drawing was exhibited at the Royal Academy of this year.

### "TARN MOOR," HINDHEAD, NEAR HASLEMERE.

This house has lately been erected near the top of Hindhead, on wild and heathery land, which slopes towards the south. The façade shown here is the northern or entrance front. The southern or garden front commands fine views of the blue hills which are so deceptive in these parts of Surrey and Hampshire that they look like distant mountain ranges. It will be seen from the accompanying ground plan that a covered way has been provided on the south side, and the floor has been laid with oak strips in order that it may be pleasant to walk there on fine winter days (as the exposed situation renders the neighbourhood cold). The fireplaces have not been placed against the external walls, but they have mostly been placed back to back inside, so that their flues, passing through the building, may help

to warm it. The hall and the chief sitting-rooms and bedrooms, besides having fireplaces, are warmed by a system of hot-water pipes.

The contractors were Messrs. Martin Wells & Co., of Aldershot, who not only supplied, but also manufactured the red bricks with which all the walls are faced. The roofs have been covered with "Excelsior" Broseley tiles.

The architect is Mr. Arnold S. Tayler, London. The drawing was exhibited at the Royal Academy of this year.

### HOUSE AT HARPENDEN.

The house was designed to suit the site. The ground having a considerable slope, the floors of the drawing-room and bedrooms were made higher than the rest of the house. By doing this the main body of the house was kept low.

The materials are mostly of local manufacture, and the whole of the work was carried out by Messrs. Phillips & Blake, builders, of Harpenden, from the design and under the superintendence of Mr. E. J. Dodgshun, of the firm of Oliver & Dodgshun, Carlisle and Leeds.

### HOTEL, ISLE OF WIGHT.

The small hotel here illustrated is to be erected on a beautiful site in the Isle of Wight, commanding views both of the Channel and inland.

The walls of the building will be largely composed of stone quarried on the estate and finished with a "rough-cast" stucco face. The roofs are to be of Horsham stone slates and most of the external woodwork is to be finished white. The internal decorations will be specially designed by the architect, Mr. F. Steward Taylor.

The drawing was exhibited at the Royal Academy exhibition of this year.

### ADDITIONS TO READING COLLEGE.

At the time of the establishment of the University Extension College at Reading in 1892, the Corporation of Reading had become possessed of a portion of old Reading Abbey, a building known as the Hospitium, of the date of Henry VI., which was in a ruinous condition,

but which the Corporation restored at considerable cost under the direction of Mr. S. Slingsby Stallwood, who at the time was a member of the Corporation and acted as honorary architect. The building in its restored condition was placed by the Corporation at the disposal of the newly-formed college. Subsequently the adjoining vicarage, of St. Lawrence was purchased, and after undergoing very considerable alteration and addition was added to the college buildings.

It was not long before the want of still further accommodation was felt, and the erection of the block of buildings which we illustrate this week was determined upon. These buildings were opened by the Prince of Wales on June 1st last. They consist on the ground floor of a college hall, 45 ft. by 35 ft. by 19 ft. high, lighted on one side by stone windows, with lead-light glazing; a college library, with large gallery and librarian's room attached; agricultural department, with general office, professor's room and lecture room attached besides two other large lecture rooms, all 16 ft. 6 in. high. On the floor beneath are two large lecture rooms and three workrooms, besides lavatory and other sanitary arrangements. To the floor there is a separate entrance off the Forbury-road, at a level half-way between the two floors, with double staircase leading up or down to the respective floors. The top floor of the new building is devoted entirely to the new art department, and is reached from the other floors by a stone staircase. This department consists of a large studio, 45 ft. by 35 ft. with open timber roof, and a special feature of this room is the eight-light stone windows at the north end, rising some 22 ft. high, whence all the light to this studio is obtained. A painting room 40 ft. by 20 ft., life room 34 ft. by 24 ft., modelling room, and wood-carving room, separated by movable partition; an director's room, and storage. All the rooms of the art floor have open timber roofs, and in all cases there is lighting from the north, and the rooms are ventilated by special means.

The whole of the buildings are lighted by electricity and heated by hot water on the low pressure system. The floors are all fireproof.





NEW GUILDHALL, CAMBRIDGE - MR JOHN BELCHER F.R.I.B.A., ARCHITECT







*Eglise de Caudebec en  
caude  
Sainte Catherine*



*A Street in  
Caudebec.*



*Caudebec.  
A Street in Caudebec.*



*Eglise St. Laurent. Rouen*



*Eglise de Honfleur.*



*Honfleur.  
Caudebec*



*Place de la  
Honfleur*



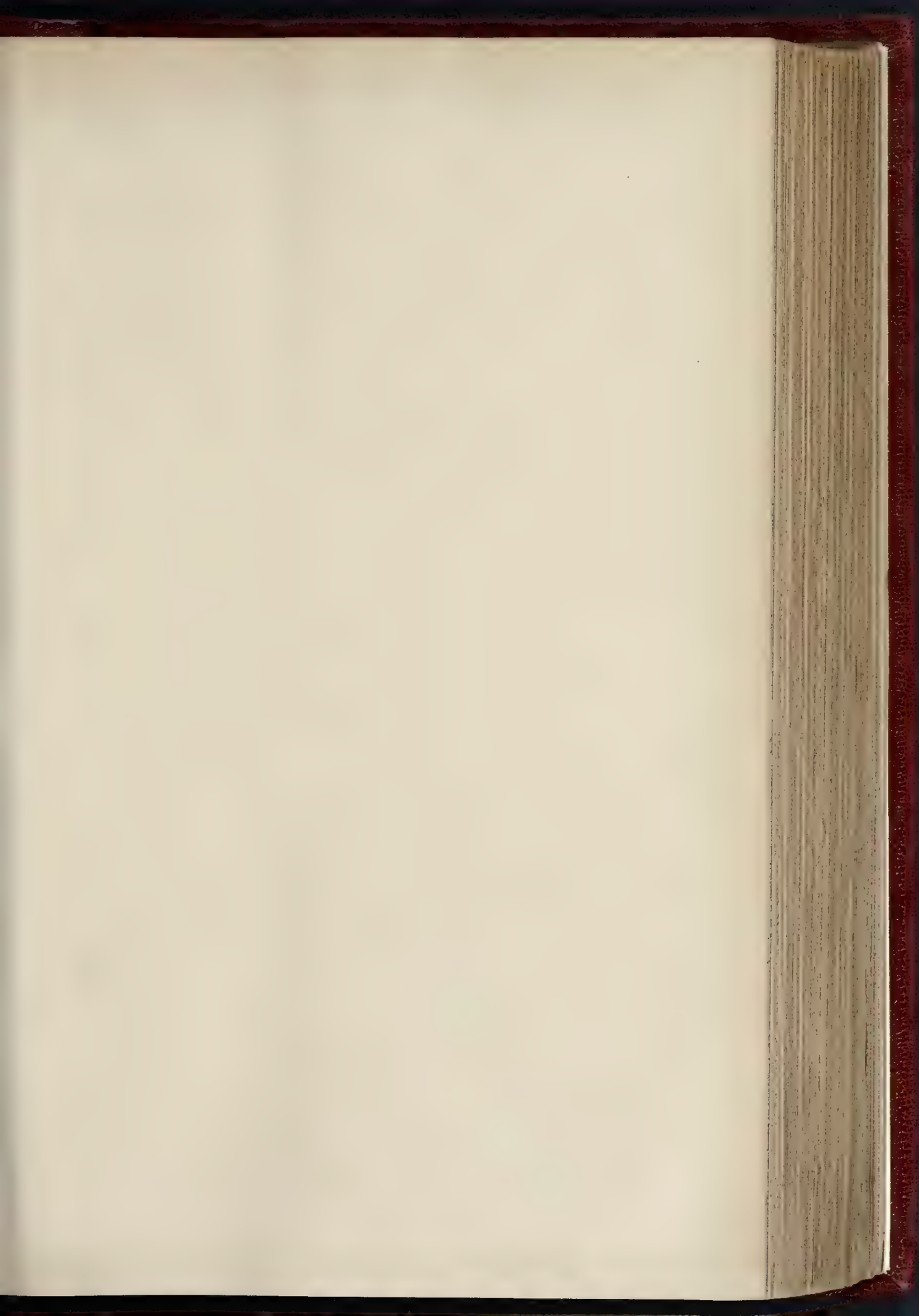
*Eglise St. Pierre. Honfleur*



GROUND PLAN

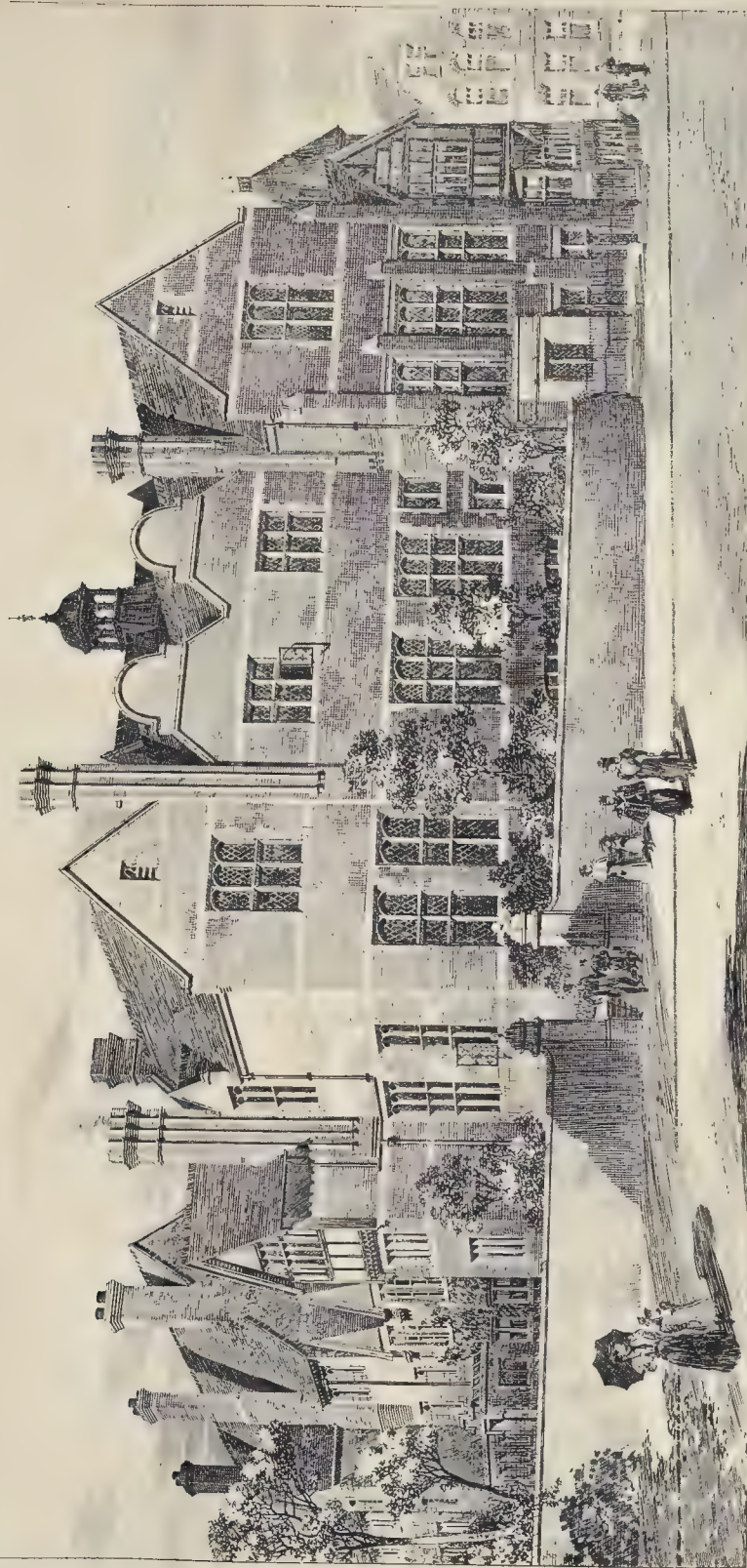






Chemical	Formula	Weight	Volume	Concentration	Notes
Hydrochloric acid	HCl	36.5	1.18	12.1	
Sulfuric acid	H <sub>2</sub> SO <sub>4</sub>	98.1	1.84	18.3	
Nitric acid	HNO <sub>3</sub>	63.0	1.42	15.7	
Phosphoric acid	H <sub>3</sub> PO <sub>4</sub>	97.9	1.70	16.5	
Acetic acid	CH <sub>3</sub> COOH	60.0	1.05	11.8	
Formic acid	HCOOH	46.0	1.22	12.2	
Oxalic acid	H <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	90.0	1.50	15.0	
Malic acid	C <sub>4</sub> H <sub>6</sub> O <sub>5</sub>	134.0	1.60	16.0	
Succinic acid	C <sub>4</sub> H <sub>6</sub> O <sub>4</sub>	118.0	1.60	16.0	
Glutaric acid	C <sub>5</sub> H <sub>8</sub> O <sub>4</sub>	146.0	1.50	15.0	
Adipic acid	C <sub>6</sub> H <sub>10</sub> O <sub>4</sub>	146.0	1.50	15.0	
Pimelic acid	C <sub>7</sub> H <sub>12</sub> O <sub>4</sub>	160.0	1.50	15.0	
Suberic acid	C <sub>8</sub> H <sub>14</sub> O <sub>4</sub>	178.0	1.50	15.0	
Sebacic acid	C <sub>10</sub> H <sub>18</sub> O <sub>4</sub>	226.0	1.50	15.0	
Dodecanoic acid	C <sub>12</sub> H <sub>24</sub> O <sub>2</sub>	200.0	1.50	15.0	
Tridecanoic acid	C <sub>13</sub> H <sub>26</sub> O <sub>2</sub>	214.0	1.50	15.0	
Tetradecanoic acid	C <sub>14</sub> H <sub>28</sub> O <sub>2</sub>	228.0	1.50	15.0	
Pentadecanoic acid	C <sub>15</sub> H <sub>30</sub> O <sub>2</sub>	242.0	1.50	15.0	
Hexadecanoic acid	C <sub>16</sub> H <sub>32</sub> O <sub>2</sub>	256.0	1.50	15.0	
Heptadecanoic acid	C <sub>17</sub> H <sub>34</sub> O <sub>2</sub>	270.0	1.50	15.0	
Octadecanoic acid	C <sub>18</sub> H <sub>36</sub> O <sub>2</sub>	284.0	1.50	15.0	
Nonadecanoic acid	C <sub>19</sub> H <sub>38</sub> O <sub>2</sub>	298.0	1.50	15.0	
Eicosanoic acid	C <sub>20</sub> H <sub>40</sub> O <sub>2</sub>	312.0	1.50	15.0	
Hentriacontanoic acid	C <sub>22</sub> H <sub>44</sub> O <sub>2</sub>	340.0	1.50	15.0	
Tricosenoic acid	C <sub>23</sub> H <sub>46</sub> O <sub>2</sub>	354.0	1.50	15.0	
Tetracosanoic acid	C <sub>24</sub> H <sub>48</sub> O <sub>2</sub>	368.0	1.50	15.0	
Pentacosanoic acid	C <sub>25</sub> H <sub>50</sub> O <sub>2</sub>	382.0	1.50	15.0	
Hexacosanoic acid	C <sub>26</sub> H <sub>52</sub> O <sub>2</sub>	396.0	1.50	15.0	
Heptacosanoic acid	C <sub>27</sub> H <sub>54</sub> O <sub>2</sub>	410.0	1.50	15.0	
Octacosanoic acid	C <sub>28</sub> H <sub>56</sub> O <sub>2</sub>	424.0	1.50	15.0	
Nonacosanoic acid	C <sub>29</sub> H <sub>58</sub> O <sub>2</sub>	438.0	1.50	15.0	
Dotriacontanoic acid	C <sub>32</sub> H <sub>64</sub> O <sub>2</sub>	496.0	1.50	15.0	
Tricosanoic acid	C <sub>33</sub> H <sub>66</sub> O <sub>2</sub>	510.0	1.50	15.0	
Tetracosanoic acid	C <sub>34</sub> H <sub>68</sub> O <sub>2</sub>	524.0	1.50	15.0	
Pentacosanoic acid	C <sub>35</sub> H <sub>70</sub> O <sub>2</sub>	538.0	1.50	15.0	
Hexacosanoic acid	C <sub>36</sub> H <sub>72</sub> O <sub>2</sub>	552.0	1.50	15.0	
Heptacosanoic acid	C <sub>37</sub> H <sub>74</sub> O <sub>2</sub>	566.0	1.50	15.0	
Octacosanoic acid	C <sub>38</sub> H <sub>76</sub> O <sub>2</sub>	580.0	1.50	15.0	
Nonacosanoic acid	C <sub>39</sub> H <sub>78</sub> O <sub>2</sub>	594.0	1.50	15.0	
Dotriacontanoic acid	C <sub>42</sub> H <sub>84</sub> O <sub>2</sub>	652.0	1.50	15.0	
Tricosanoic acid	C <sub>43</sub> H <sub>86</sub> O <sub>2</sub>	666.0	1.50	15.0	
Tetracosanoic acid	C <sub>44</sub> H <sub>88</sub> O <sub>2</sub>	680.0	1.50	15.0	
Pentacosanoic acid	C <sub>45</sub> H <sub>90</sub> O <sub>2</sub>	694.0	1.50	15.0	
Hexacosanoic acid	C <sub>46</sub> H <sub>92</sub> O <sub>2</sub>	708.0	1.50	15.0	
Heptacosanoic acid	C <sub>47</sub> H <sub>94</sub> O <sub>2</sub>	722.0	1.50	15.0	
Octacosanoic acid	C <sub>48</sub> H <sub>96</sub> O <sub>2</sub>	736.0	1.50	15.0	
Nonacosanoic acid	C <sub>49</sub> H <sub>98</sub> O <sub>2</sub>	750.0	1.50	15.0	
Dotriacontanoic acid	C <sub>52</sub> H <sub>104</sub> O <sub>2</sub>	808.0	1.50	15.0	
Tricosanoic acid	C <sub>53</sub> H <sub>106</sub> O <sub>2</sub>	822.0	1.50	15.0	
Tetracosanoic acid	C <sub>54</sub> H <sub>108</sub> O <sub>2</sub>	836.0	1.50	15.0	
Pentacosanoic acid	C <sub>55</sub> H <sub>110</sub> O <sub></sub>				





NEW BUILDINGS, READING COLLEGE SOUTH EAST VIEW —M<sup>r</sup>. S. STINGSBY STALLWOOD, F.S.A. ARCHT. 1861

WINDMILL

1861

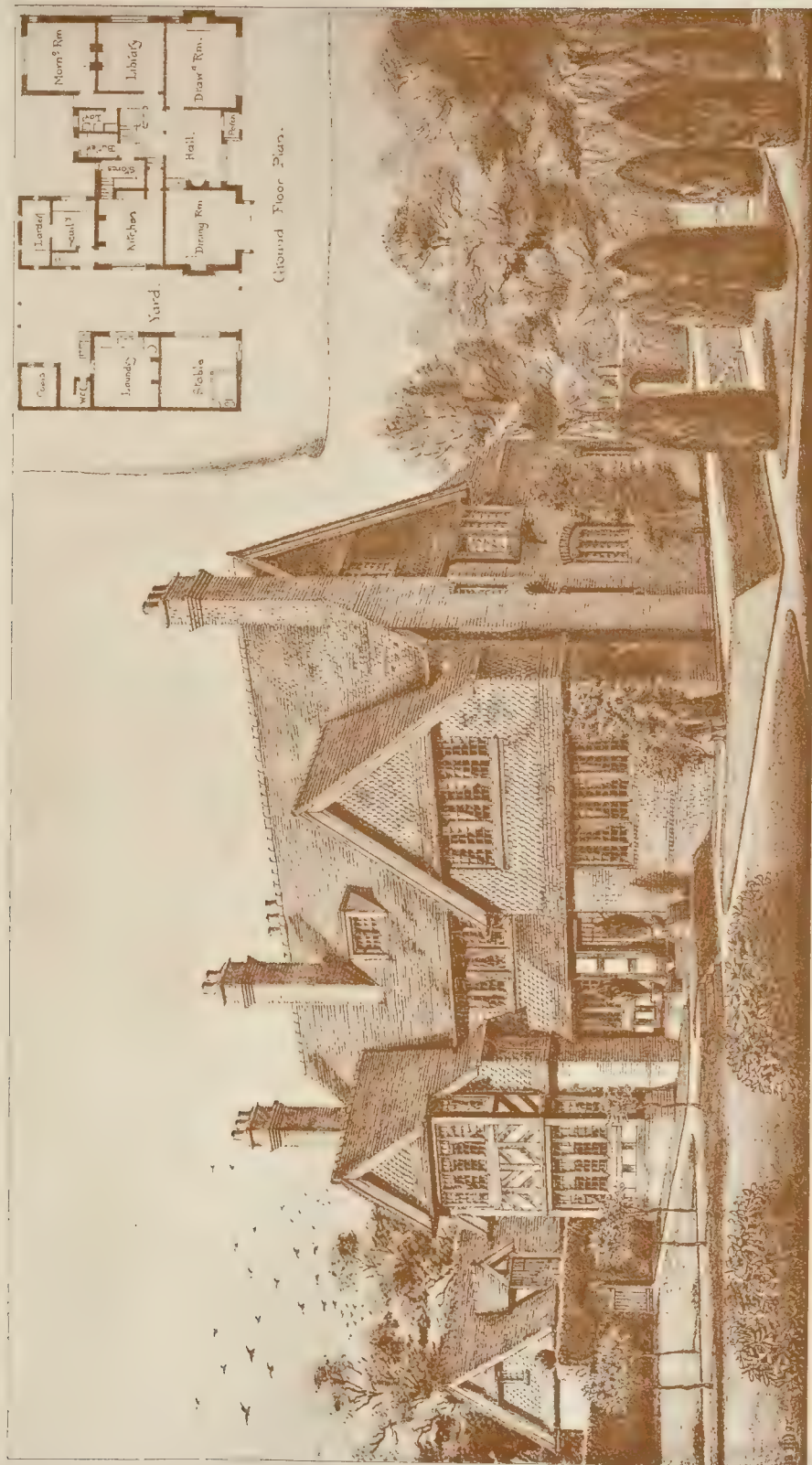
1861

1861

1861



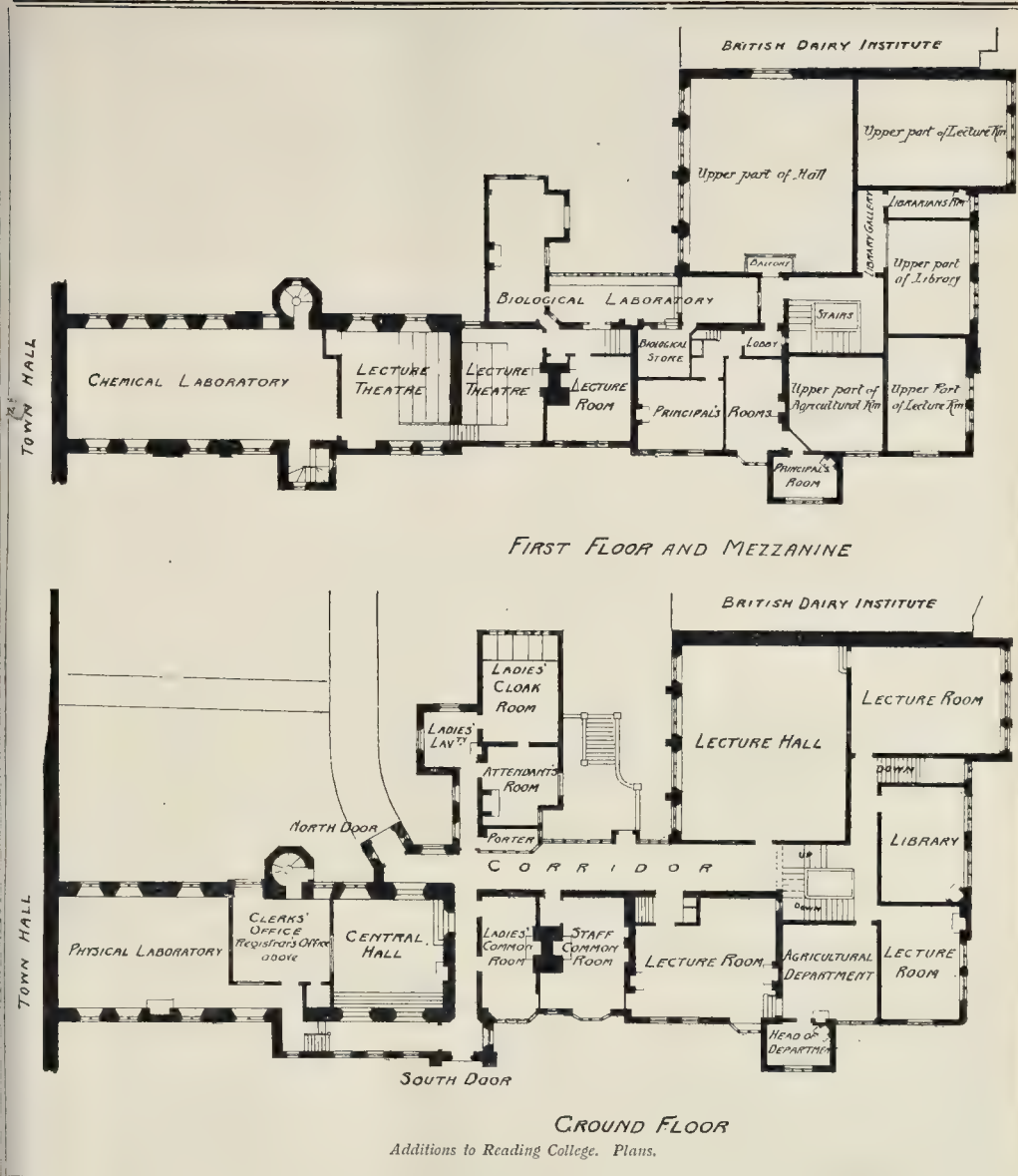




HOUSE AT HARPENDING MR E J DORRISSEN, F.R.I.B.A. ARCHT







constructed of steel girders and joists, with hollow tile lintels and concrete filling, and in some cases have a clear span of 35 ft. between supports. The surface of these floors is covered with pitch-pine blocks. The principal rooms have panelled dados, 6 ft. 6 in. high. The walls are plastered with the Adamant Company's patent plaster, which gives them a very hard clean surface.

The general contractors were Messrs. Henry Higgs & Sons, of Reading; Mr. Alfred Holt acting as general foreman; the steel girders and fireproof flooring are by Messrs. Mark Fawcett & Co., London; wood-block flooring by Messrs. Geary & Walker, London; artificial stone staircases by Messrs. Wilkinson & Co., London; sanitary appliances by Messrs. Bolding & Sons, London; heating apparatus by Messrs. Rosser & Russell, London; electric lighting by Messrs. T. C. Williams & Son, Reading; steel casements, Mr. J. E. Lucas, Brockley; and roof glazing in the art rooms by Messrs. Helliwell & Co., London. The whole has been carried out from the designs and under the personal direction and supervision of Mr. S. Slingsby Stallwood, architect, of Reading.

#### SKETCHES IN NORMANDY.

THESE small sketches were made during a short holiday in Normandy. They represent subjects which may no doubt have been sketched and described many times, situated as they are in a country so full of interest to the artist and student, rich examples of architecture and picturesque bits abounding in every direction.

One of the most beautiful towers is that of St. Laurent, in the Rue Thiers, Rouen, built at the end of the fourteenth century; the upper part is exceedingly rich in appearance, crowned with flying buttresses and pinnacles. The church itself, or rather the remains of it, is, I understand, now used as a workshop. The small balcony at the side has a very quaint appearance.

Caudebec is a very old and interesting town, its picturesque streets and timbered houses supplying the artist with ample material. The principle feature is, of course, the church, a beautiful specimen of the fifteenth century, exhibiting the Flamboyant style in all its perfection. The tower is divided into three

stages, with rich buttresses and windows, and is surmounted by an open-worked stone spire (the subject of one of these sketches) of the most delicate workmanship.

Havre has little to offer of special interest to the architect; the general bustle, especially in the markets and at the docks, makes, however, a pleasant diversity. It is said that the tower of the Parochial Church of Notre Dame was at one time a lighthouse.

G. W. COLLINS.

CHAPEL, MANCHESTER. — A conventual chapel, also for the use of an orphanage, the memorial stone of which was laid by the Bishop of Salford last month, is approaching completion in the enclosure of the Sisters of Charity of St. Vincent de Paul, in Victoria Park, Manchester. It is in length 90 ft., by 30 ft. wide, in one span. An ambulatory surrounds the sanctuary to give relief to the altar. The work is in brick and Ruabon terra-cotta. It is fourteenth century (French) in style and has traceried windows. The east end is apsidal in form. The roof, pitch pine, is hammer-beam with pierced panels. Messrs. Wilson & Toft, of Manchester, are the contractors, and Mr. W. H. Rawle, of Manchester, is the architect.

ST. COLMAN'S CATHEDRAL,  
QUEENSTOWN.

ABOUT thirty years ago the foundation was laid of St. Colman's Cathedral, Queenstown, in the diocese of Cloyne, and the building, which has long been used for Divine worship, is now practically completed. It was contemplated at the time to build a comparatively plain structure, without any appreciable amount of ornament either internally or externally, and with that view several architects were invited to send in designs in competition. Several designs were submitted, and the one by Messrs. Pugin & Ashlin—then in partnership—was selected. The old church was taken down, and the trenches for the foundations excavated, and on July 15, 1863, the first stone of the masonry of the foundation was laid. The corner, or ceremonial, stone was laid on September 30 in the same year. The foundations were then rapidly completed with, and soon the works were in a condition to enable the committee to advertise for tenders for the superstructure. The tender of Messrs. Mende & Son, Dublin, for £33,000, was accepted. The extreme length of the cathedral from east to west is 210 ft., the breadth across the transepts 120 ft., the breadth across the nave and aisles 84 ft., the breadth across the chancel and four side chapels (three of which are completed) 116 ft. The height to the ridges of the roofs of the nave, chancel, and transepts, 100 ft. The height to the top of the cross on the tower and spire, when completed, will be 300 ft. There are four octagonal turrets at the angles of the transepts, each about 120 ft. high, and two similar turrets terminating the nave walls on the west front, each containing winding stair approaches to the organ-gallery, music-room, tower and roof, each 130 ft. high. These dimensions are considerably in excess of those of the original plans upon which the contract was made, as both plans and details were extended and elaborated as the works progressed. The material used in the external facing of the walls is blue Dalky granite, and the cut-stone dressings are of Mallow limestone, except the cornice and gutter courses, which are of Ferny limestone. All the stone for the rubble work was obtained from the local old red sandstone quarries of Spy Hill and Castle Oliver. The whole of the interior faces of the walls are lined with Bath stone, and the columns of the nave and chancel arcades, and the arcades of the shrines and confessionals are composed of marbles from the quarries of Ferny, Middleton, and Connemara. The slates used on the roofs are Belgian green, and all the hips, ridges, ventilators, and doors of passages through the roofs are covered with lead. All the gutters are constructed of limestone, and inclined gutters of stone are provided where the roofs of the side chapels terminate against the walls and gables, there being no lead used for either gutters or flashings throughout the building. The ridges of the roofs of the nave, chancel, and transepts are surmounted by wrought-iron crestings, galvanised, manufactured by Messrs. Webb, of Belfast. When the contractors had carried up the external walls of the cathedral to an average height of about 12 ft. it was thought that a cathedral ought to have greater embellishments than an ordinary parish church. About this time, owing to the extensive business commanded by Messrs. Pugin & Ashlin, and the fact that Mr. Pugin resided in England and Mr. Ashlin resided in Ireland, it was thought that it would be more advantageous to both to divide the business, each to practise in the respective country in which he resided. This course having been adopted, the work in connexion with St. Colman's Cathedral fell to Mr. Ashlin, and the Bishop and committee ultimately determined upon making the cathedral more elaborate and imposing. It is stated that from this time the whole character of the works was changed—new drawings had to be prepared, and, in fact, with the exception of the ground plan, none of the original drawings were adhered to. The contract with the Messrs. Meade, who built about a third of the structure, was then terminated by mutual agreement, and from that stage the Bishop and committee took over the works and carried them on under the supervision of the architect, with Mr. Doran as clerk of works, until the cathedral was opened for Divine worship. Since then there have been erected the statues, in white marble, of "Our Lady Star of the Sea," on the south transept gable, the statue of St. Joseph in a corresponding position on the gable of the north transept, and the statue of St. Colman on the gable of the west front. A gilded statue of our Lord is erected on a pedestal at the intersection roof of the apse, as well as life-size figures of the twelve Apostles, St. Patrick, St. Celestine, and St. Barnabas. These figures are of Portland stone, and are fixed on pedestals surmounting the parapet around the apse and transepts. In niches lower down in the building are life-size figures of St. Nicholas, St. Blasius, St. Francis, St. Bridget, and St. Helen. There are still many pedestals and niches awaiting figures, which, it is hoped, will be enriched by the reception of them at an early date. Above the large windows that light the transepts in the gables there are inserted two groups of life-size figures—that in the north transept being the Holy Family, and that in the south transept the Coronation of the Blessed Virgin. The first-named is of Mallow limestone,

and the second named is of white marble. For a long period the only portion of the interior of the cathedral in which an effort was made to approach completion was the chancel, apse, and side chapels. In these, mosaic floors were laid down, the ceilings were groined with wood, the walls were diapered, and the capitals, bosses, and cornices sculptured. In the chancel a high altar was erected, and in the side chapels three altars were erected also—one in the Lady chapel, one in the chapel of the Sacred Heart, and one in the mortuary chapel. The whole of the altars are of white marble, furnished with columns of coloured marbles and figures in statuary marble; panels and background being enriched with designs and monograms in gold mosaic. The high altar, and altar in the Lady chapel, are from the studio of Messrs. Early, of Dublin, and the altar of the Sacred Heart and mortuary altar are from that of Mr. John A. O'Connell, of Cork. The communion rail, 106 ft. in length, in an unbroken line, is an open arcade, the table arcade and base of which are of white marble, and the supporting columns of Cork red and Galway green marbles. It is provided with a central gate from the nave, and two smaller gates—one opposite each aisle. This rail was executed by Mr. Patrick Scannell, of Cork; and the gates were made by Messrs. O'Gloughlin, of Dublin. The confessionals are formed like little chapels in the thickness of the aisle walls. An effort was made to fill in some of the windows with painted glass, and the window in the east end of the Sacred Heart chapel was the first which was undertaken. The great window of the south transept was next filled in—the subjects having reference to scenes in the life of the Blessed Virgin. The glass was provided by Hardman, of Birmingham. The window in the east end of the mortuary chapel was filled in with painted glass from the firm of Early, Dublin, and the subjects represent the visit of our Lord to Martha and Mary and the raising of Lazarus from the dead. A window was erected in the north aisle to commemorate the long connexion of the Rev. Daniel Keller with the parish. This window is by Messrs. Cox & Buckley. The throne and stalls in the chancel are of oak, as is the sedilia. They are from the workshops of Messrs. Benkey, Dublin. Messrs. Creedon & Son, Ferny, were the contractors for the wood-groined ceilings of the nave and transepts; Mr. John A. O'Connell, of Cork, for the sculpture of the capitals, panels, bosses, cornels, diaper and figure work, and the cleaning of all the stone work of the interior; Mr. Smith, of Dublin, for the sculptured groups of the Stations of the Cross; Messrs. Sharp, Dublin, for the stone groining of the aisles, oak pulpit and the polishing of the marble columns; the Wood-block Flooring Company, London, for the oak block floors of the nave, aisles, and transepts; T. C. Edwards, Ruabon, for the ceramic mosaic passages of the nave, aisles, transepts, baptistry and porches; Ludwig Oppenheimer, Manchester, for the gold, &c., mosaic of the shrines; Messrs. M'Gloughlin & Sons, Dublin, for the ornamental brass and iron work of the triforce arcades, the shrines, gas standards, and candelabra; and Messrs. Murray & Son, Youghal, for the pitch pine bench seatings of the nave, aisles, and transepts. A large amount of sculpture work has been carried out in the nave, aisles, and transepts. Mr. Henry is now engaged on the sculpture of the west doorway.

## Books.

*Elementary Architecture: for Schools, Art Students, and General Readers.* MARTIN A. BUCKMASTER. Oxford: Clarendon Press. 1898.

"**E**LEMENTARY ARCHITECTURE" is another testimony to the increased interest in the subject which is now being taken by educational bodies. The author holds an official position, being described as "Art Master at Tonbridge School, and Art Examiner to the Department of Science and Art, the Oxford Local Examinations Delegacy, the Civil Service Commission, the Technical Education Board of the London County Council, &c." The publication of the book is undertaken by that great source of instructional works, the Oxford Clarendon Press; an origin which, in itself, confers distinction and a species of authority. We were accordingly prepared to welcome a useful—it might even prove an important and valuable—addition to the already fairly long list of architectural handbooks. To be obliged, therefore, as we are, to record our conviction that the only satisfactory portion of the book is the preface, is a genuine disappointment. The sentiments and aims with which the author sets out are unexceptionable—indeed, most excellent. We might quote, but for considerations of space, the whole of his preface with unqualified pleasure and approbation. He raises very high hopes. But, unfortunately, his aptly expressed admiration for his subject bears no proper

relation to his capacity for treating of it. If Mr. Buckmaster's acquaintance—we will not say with architecture itself, but merely with current architectural literature, were in any degree commensurate with his ambition, he might have produced an admirable work; as it is, his book scarcely seems to justify its existence, or, at any rate, its publication. For it would not be difficult to name a dozen books of similar or not much greater bulk, and some of them published many years ago, any one of which could better be recommended to the class of readers for whom this book is intended.

From the many elementary treatises already in existence Mr. Buckmaster's book is not distinguished by special merit in any particular direction; we cannot find that it contains new facts, original observations, improvements in methods of arrangement, or even fresh illustrations; in short, it adds nothing to the student's available sources of information. It has all the appearance of a mechanical, indiscriminating compilation from a very limited number of authorities of rather ancient date, and evidences of personal research or even reflection are wanting. The old pernicious habit of concentrating attention chiefly on curious details pervades the work: broad and philosophic handling seems to be outside the author's range of thought. The choice of illustrations is peculiarly unhappy. The majority of them are about the last things which ought to be set before a student as examples—poor reproductions of originals which may have been thought meritorious half a century ago, but which, as compared with contemporary drawings, possess neither accuracy nor spirit. The fact that masonry is usually represented without any joints sufficiently stamps the value of these representations. The date of "1808" on the title page positively looks like a mistake; except for the presence of three or four photographic views, the whole work might very well have been produced in the "forties." It should be added, that the book contains a short glossary of technical terms, but no Index.

*The Manufacture of Glazed Bricks and Glazed Sanitary Ware.* By H. ANSELL. Second Edition. London: H. Greville Montgomery, 1898.

THIS second and larger edition of a very useful little work, "entirely re-written and revised," appears opportunely in view of the great interest taken at the present time in the subject of lead-glazing. The general contents of the work may be summarised as a description of modern methods in use in the manufacture of glazed bricks, &c.; this is followed by a list of recently-adopted bodies and glazes, and others which have been in use a long time and have proved to be efficient, or are adapted to special clays and for particular articles. Bodies and glazes suitable for large goods, such as porcelain baths, sinks, &c., are also dealt with at some length.

The author gives a good account of the fires, clays met with in different parts of the country, from the point of view of their uses, and sub-joins several chemical analyses. In some cases, these latter are interpreted, in an elementary way; this part of the subject could have been enlarged upon to advantage. In regard to machine-made bricks for glazing it is noted that the stream of clay issuing from the die must be perfectly sound at the angles. This is easily secured with dies of nearly any class as long as the clay is maintained at an uniform and suitable stiffness, and the speed at which the pug is driven is maintained without much variation, particularly as to sudden increase of speed. On the other hand, variations in any of these respects, and insufficient lubrication of the die, quickly cause the expressed clay to break and tear at the angles, and any water getting into these causes a crack which no subsequent process will eliminate. The cross cutting of the wires also jags the edges slightly, and owing to the oil or water lubrication of the rolls or table, only one face of the brick is clean and suitable for a glazed face. The operation of the ordinary pug also, in producing "lamination" in the brick, is also a source of difficulty as tending to produce pinholes in the glaze. It is now generally recognised that to get the best results one of the chief conditions is that the clay shall issue in a stream of the size of the brick and be cut off in brick lengths so that the grain of the clay, and the surface in particular, should be in the



direction of the length of the brick, approximating to the hand-made brick. The book contains much information on these and kindred topics, in a concise form.

The chief part of the book is occupied by a description of body and glaze materials. Amongst these china clay naturally holds a foremost place as the main constituent of the "body," then come the ball clays and blue clays from Dorsetshire, Hampshire, and North Wales. In the section on flints we get a little metallurgy. The author observes that ground flint resists shrinkage more than any of the other compounds of a "body," it is one of the chief antidotes of crazing in body or glaze, but if used in excess will cause "shelling off" of the glaze. The uses of Cornish stone, whiting, plaster of Paris, and felspar are duly recognised. In reference to plaster of Paris it is noted that the old idea that this substance was necessary to enable a glaze and body to be used on white hard clay goods has been given up. The idea probably arose from the fact that it may have slightly lessened the contraction of the bodies and glazes, which thus enabled them to give better results than without it. Nevertheless, it does assist in breaking up and rendering uniform the particles of other materials of which the mixture is composed, thus rendering considerable service.

Frit glazes are dealt with at some length; they are glazes principally used for white and other Staffordshire tiles, pottery, &c., and are also employed for the purpose of softening and adding brilliancy to hard glazes. Many firms, however, do not use them, as the quality of the brick on which they are put is liable to be seriously interfered with. On the other hand, where the clay used in making the bricks is of indifferent quality, frit is employed so that less heat shall be required to flux the glaze proper than would otherwise be the case, thus saving the brick from being over-fired and becoming brittle.

White lead gives the greatest brilliancy of surface, but, as is well known, is dangerous to work people unless very carefully dealt with. It is by no means indispensable for such glazes as are above alluded to. The author remarks that while lead is also objectionable owing to its volatile nature and somewhat irregular action, requiring great care and watchfulness when at the point of finishing, and, moreover, imparting a dark hue to the glaze. When burnt, a glaze containing much lead is soft, easily scratched and defaced, whilst it is readily attacked by acids and is often materially affected by the action of the weather.

A chapter devoted to white bodies with glazes gives many recipes; ivory, cream, and coloured bodies and stains are discussed in the same manner; and other chapters deal with majolica glazes and enamelling. The subjects of setting and burning are briefly discussed, and the work concludes with some observations on porcelain ware. This book should prove most useful to manufacturers of glazed bricks and glazed goods generally.

*A Short History of Hampton Court.* By ERNEST LAW. With numerous illustrations. London: Geo. Bell & Sons. 1897.

*Hampton Court.* By WILLIAM HOLDEN HUTTON, B.D. With illustrations by Herbert Railton. London: J. C. Nimmo. 1897.

MR. LAW's book is simply an abridgment or résumé of his great work on the history of Hampton Court, the value and thoroughness of which have already been fully acknowledged and described in our columns. The present publication is a one-volume book intended for a larger public than could be expected to require the large three-volume history. All that seemed essential has been reproduced in the small book (which after all contains more than our hundred close pages), but much topographical detail and discussions on art and archaeology have been omitted, and it has not been thought necessary to give authorities or references, for which the reader can consult the original work.

Those who are interested in Hampton Court have now therefore available a trustworthy and authoritative history of the place, by a writer who has made the subject his own, compressed in one volume of convenient size. The illustrations are such as to give information rather than to aim at artistic effect. This, in short, is the "lesson-book" on the subject, in comparison with which Mr. Hutton's volume

may stand as the "play-book." As Mr. Hutton frankly owns his indebtedness to Mr. Law's book, his own might be thought rather superfluous; but in fact it seems to be written partly to accompany Mr. Railton's sketches, which are in his very best style; in fact a book on this comparatively small scale could hardly be more beautifully illustrated. The writing, though in an easy anecdotal style, gives a good general idea of the history of the place and of the distinguished persons who have inhabited or been connected with it, and the sovereigns who have played "high jinks" there; an expression certainly not too strong for some of the saturnalia held there by James I., at all events. The author's remarks on Wren's work there are sensible, though it is going a little too far to say that Hampton Court as he planned it would have rivalled Versailles, as far as architectural grandeur is concerned; it was no doubt the intention of William III. that the grounds should emulate Le Nôtre's work. It is doubtful if "every detail," in our sense of the words, "passed under Wren's eye." All the practical details of planning and arrangement probably did; but it is probable that decorative detail, as far as there is any, was left a good deal to the instinct and habit of the contemporary artisan.

Mr. Law's book is one to be read for information and kept in the study bookcase; Mr. Hutton's is one to be read for amusement and laid on the drawing-room table as an ornament, after the fashion in country-houses. For this purpose it could not be better—it is well bound, well printed, and well illustrated; and just well enough written to dip into at an idle moment.

*The Renaissance in Italian Art (Sculpture and Painting).*—By SELWYN BRINTON, B.A. London: Simpkin, Marshall & Co. 1898.

THIS is a very small book for so large a title; but we gather from the preface that the author's object has been to catch those who are not likely in the first instance to buy or read large works on the subject, and to lead them up to the wish for the further knowledge to be gained from standard works. In this way it may certainly be useful, as it appears to be written with a competent intellectual grasp of the subject, and the concluding chapter, on "The Enigma of the Renaissance," places in a striking light the intellectual and moral effect of the worship of ancient art in the Renaissance period. On one side were "Savonarolo's tremendous sermons," on the other side this beautiful dead world of Heathendom.

"It was like opium to them, this breath out of the beautiful dead past, that crept up and encircled them in its magic; no preaching could reach them then, no priest or monk really bring them back into the old narrow ways that had sufficed their forefathers."

We watch them, like men spellbound, ceasing to care greatly for war or politics or (almost) futurity, expressing with their whole souls this marvellous dream that was holding them, in forms of hybrid and strangely fascinating beauty, grasping with their whole powers of life at yet further, completer, more satisfying expression and knowledge."

It is not often thought necessary, in small handbooks, to go into this aspect of the subject; writers of such books are too often content with merely cataloguing works of art and artists. But surely the first thing in leading people up to any comprehension of Renaissance art, is to assist them to realise the extraordinary phenomenon which it presents from a philosophic point of view; to understand what it was and what it meant. It is this perception which redeems Mr. Brinton's little volume from the ordinary category of popular handbooks.

#### TRADE CATALOGUES.

MESSRS. A. BOYD & SON send us their illustrated catalogue of Fireplaces, "Decorative Section," containing illustrations of some large fireplaces in various styles, and a number of smaller fireplaces. Among these the best in an artistic sense are the more simple ones. The drawings perhaps do not do full justice to the others, but neither drawing nor design are quite up to the best standard. There has been a great advance lately in this kind of design for trade productions, the designs being often made by eminent architects and furniture designers, and the kind of work shown here is not up to such a standard, though for practical purposes we have no doubt these fireplaces are excellent.—The London

Portland Cement Co. send us their catalogue of "Scaglioli" building slabs, a material which has been already specially noticed in our columns.—The book of illustrations sent us by the makers of "Stephens' Inks" can only come within our scope for notice in regard to the view of the new premises now building in Aldersgate-street, which seems to promise to be a pleasing specimen of street architecture; they might as well have added the architect's name.—The Non-Flammable Wood Company send us a pamphlet with a history and description of their process, which has been already noticed in our columns.—The N. A. P. Window Company send us several additions to their illustrated catalogue, including their "air-tight" centres for centre-hung fanlights, to avoid draught through the centre; their "concealed stay" for casement windows, which when the window is closed disappears into a mortice in the frame; this is a real improvement in regard to appearance. They also send a section of their wet and draught excluder for the bottom rail of a wooden casement sash, made with the special object of having as little projection as possible above the floor, for windows opening down to the ground; we doubt, however, if it would entirely keep out a driving rain.

#### BOOKS RECEIVED.

THE YOUNG ESTATE MANAGER'S GUIDE. By R. Henderson (W. Blackwood & Sons).  
GEOLOGY FOR BEGINNERS. By W. W. Watts. (Macmillan & Co.).

#### Correspondence.

##### To the Editor of THE BUILDER.

##### REIGATE COMPETITION.

SIR,—It may interest your readers to know that we addressed the following questions to the Reigate Borough Surveyor:—

"Who are the assessors referred to in the conditions—are they of established reputation in the architectural profession?"

"Is it the Council's intention to employ the competitor placed first, provided he is professionally of good standing?"

"Have the conditions received the approval of the Royal Institute of British Architects?"

We have received the following reply:—

"DEAR SIRS,—I am in receipt of yours of yesterday, and in reply much regret I have nothing more to add to the conditions of competition supplied you.—Yours truly, (Signed) W. H. PRESSCOTT, Borough Surveyor."

Comment seems superfluous. ICARUS.

\*\* The above letter arrived too late for insertion in our last issue.

##### HORSHAM CEMETERY CHAPEL COMPETITION.

SIR,—In your last issue you have a Note upon the proposed Horsham Cemetery Chapel competition, and as the information therein contained is misleading in reference to my action, I shall be obliged if you will permit me to state the facts, which are as follows:—

Upon receiving an invitation to submit a design, I wrote stating I should be pleased to do so provided the committee would grant an extension of time, and stated that I presumed definite instructions would be issued to each competitor, viz., as to scale, style, material, cost, if under motto, and upon the usual terms to the successful architect; in the report of the *West Sussex County Times*, upon which your Note is based, no mention is made of these facts beyond that as to the extension of time.

I then called upon the secretary to the committee to emphasise the necessity for definite conditions, and stated that unless these were given I should not be prepared to submit a design. These points were brought before the committee, who granted an extension of time, but still left all other matters to the discretion of the competing architects. I then wrote withdrawing from the competition.

FREDERICK WHEELER.

\*\* We congratulate Mr. Wheeler on his decision. This was perhaps subsequent to the newspaper report on which we commented.

##### A SANITARY ANACHRONISM.

SIR,—In No. 2 of *Harmsworth's Magazine* is a picture entitled "Making a marriage in the olden time." We are accustomed to costume pictures in which wigs, knee-breeches, and cocked hats are prominent features; but never in a work of this class have I seen such praiseworthy insistence on the necessity of carrying the soil pipe up the roof well out of the way of the dormer window.

NORMAN WIGHT.



## The Student's Column.

SOUND, LIGHT, AND HEAT.—X.

SOUND: THE PHOTOPHONE.

It is not generally known that sounds may be transmitted over long distances by the agency of a simple ray of light. The instrument enabling this to be done is called the photophone. In some electrical experiments it was discovered that sticks of the metal selenium, although an excellent medium of resistance in most cases, failed to a certain extent in others. At one time one of these sticks would prove a bad conductor, and at another unaccountably become a comparatively good one. It was ascertained that this peculiarity was due to the variation in the quality of light falling upon the selenium—a stick which offered a certain resistance to the electricity in the dark only offering one-half the resistance in daylight. From its variable resistance in the electric current it will be seen that a galvanometer could be employed in demonstrating the action of light on the selenium, the variation of the current running *pari passu* with that of the light.

Graham Bell soon found that the telephone could also be employed in showing the action of light on selenium. His further discoveries in this direction are summarised by Mr. William Ackroyd, who reminds us that the telephone only emits sound when a rapidly variable current of electricity is passing through it, and consequently no sound is given out so long as the regular current from a battery passes through the telephone in unvarying strength continuously and steadily; therefore, to make a telephone give out sound owing to the action of light on selenium placed in the circuit, it was found necessary to rapidly vary the quantity of light falling on the selenium, so as to produce a rapidly variable current passing through the telephone. This was soon effected, and it was discovered that the necessary variation in the quantity of light might be produced a very great distance away—that, in short, various sounds might be impressed on sunbeams travelling with marvellous rapidity, to be re-converted into sound by the selenium receiver, or cell, a long way off. Ackroyd further remarks that in the apparatus devised by Graham Bell, the rapid changes from light to darkness producing the required variations in the conductivity of the selenium led to changes in the latter corresponding in frequency to musical vibrations, and a musical note was in consequence emitted by the telephone. It will be perceived that the active agent is a sunbeam, whilst the sound effect depends upon the rapid variation of an electric current. We all know of modern experiments in wireless telegraphy, but here was a method invented many years ago of transmitting sound over long distances by means of a beam of light only.

So far, however, Bell could only send a musical note by this means. It occurred to him subsequently that speech could be sent in the same way, and the difficulties were gradually overcome. He caused the light to influence or vary the current of electricity passing through the selenium, just as sound-waves are made to influence or vary the current of electricity passing through the carbons in a microphone; so that just as the telephone reproduces speech in the latter case, so also it was made to do in the former. We need not describe the various forms of receivers and transmitters used in these experiments, but the form of photophone which, according to Ackroyd, appears to have given the most satisfaction, is a thin piece of looking-glass framed and placed at an end of a speaking-tube, in such a position as that it may be set in vibration by means of the voice. The mirror is, of course, as flexible as possible, and the student will understand that a beam of light reflected from its face is varied by the vibrations alluded to. In other words, the mirror acts as a transmitting instrument, for when a parallel beam falls on it, and is reflected, the quantity of light which reaches the distant selenium receiver evidently depends upon the state of the mirror's surface at that moment. To collect or receive the sonorous beam Messrs. Bell and Tainter devised a parabolic reflector having a selenium cell in its focus connected by wires to the telephone and battery. Various other improvements have been made from time to time, but the principle remains the same. For instance, in the course of their experimental work the two last-

mentioned observers found that a sonorous beam possesses the power of causing most substances to emit sound when they are placed in its path, so that the selenium receiver, battery, and telephone could be dispensed with. From this it has been demonstrated that solids, liquids, and gases placed in test-tubes are efficient sound-producers when a sonorous beam is converged on to them.

### Sound Produced by Radiant Heat.

An outcome of these experiments with the photophone, foreshadowed in the last sentence, is the relationship existing between radiant heat and sound. The salient phenomena are conveniently demonstrated by Duboscq's apparatus, which is an arrangement by which an intermittent beam of radiant heat may be made to act on various bodies. It consists of a disc mounted on a horizontal axis, and which can be rotated at any desired speed. The disc is perforated by a series of holes, the numbers of which are in some multiple of the ratio 4:5:6:8. On the stand is a support, bearing a screen and wide tube, behind which is whatever source of radiant heat that may be employed. If the rays of the latter are to be concentrated on one series (or line) of holes a double convex lens is fitted to the support, or a cylindrical lens when a slice of thermal rays is to be used.

Tyndall showed that when a long-necked flask of a certain shape, containing a small quantity of ether, was placed so that the intermittent beam from a lime-light could fall on it, a distinct musical note was heard in an ear-trumpet attached to the flask. Amongst liquids it has been found that the best absorbers of heat give the loudest sounds by the method. The pitch of the musical note depends on the rapidity with which the disc is rotated.

Tyndall did not succeed in getting dry air to emit sound when acted upon by the intermittent beam, though moist air did; other gases yield sounds in the order of their absorption of heat. Sounds were not so clearly brought out when solid bodies were acted upon. In this connexion the ear-trumpet invented by Mercadier may be alluded to. The plates of various materials to be experimented with were, one at a time, fixed in the mouth of this ear-trumpet. Atkinson observes that when the intermittent beam is allowed to act on this plate it is set in vibration and a sound is produced. This is not due at any rate chiefly, to transverse vibrations of the plate, for neither the pitch nor the quality of the note was altered when the thickness and nature of the plate were changed, nor was it altered when the plate was slit. The best effects were obtained when the diaphragm was of thin metal foil coated with lampblack on the side next the rays. Marked effects were also obtained when a transparent plate was used blackened on the side away from the rays. The effect is one of radiant heat, and is essentially due to alternate expansions and contractions of the layer of air in contact with the surfaces which absorb the radiant heat.

We have seen that a great number of substances are thrown into vibration by the intermittent action of light; Lord Rayleigh has demonstrated that, as was originally thought, the sounds in question are due to the bending of the plates (when these are used) in consequence of unequal heating. This view is now generally adopted.

### The Photograph.

It is unnecessary to describe this well-known instrument in detail, but some of the principles involved may be briefly alluded to. It is an instrument for recording and reproducing sound, and consists essentially of a cylinder mounted on a horizontal axis, which can be rotated beneath a mouthpiece. The shaft of the handle attached to the horizontal cylinder has a wormed thread, which as the shaft is rotated works in a correspondingly grooved bearing. A helical groove is cut upon the surface of the cylinder of the same "pitch" as the wormed thread upon the shaft. Thus, it will be seen that as the latter is rotated, the cylinder moves backwards or forwards, as the case may be.

The mouthpiece is fixed over this cylinder and the bottom of it consists of a highly-sensitive diaphragm or membrane. Between the membrane and the cylinder a style is so arranged that one side of it—the point—shall be directed towards the cylinder, and work over the helical groove alluded to, whilst the other side touches the membrane. A sheet of tin-foil is stretched across and around the cylinder, care being

taken not to impress it in the grooves, but that it shall be stretched across them from the ridges between the grooves. It will be seen that the point of the style just touches the tin-foil over the grooves, whilst the other side of it touches the membrane.

On the operator speaking in the mouth-piece, the diaphragm is set in vibration,\* which vibration sets the style in motion and causes its point to make an indentation on the stretched tin-foil. The cylinder is rotated at the same time as the operator is speaking, and the depth of the indentations in the groove made by the style will vary with the inflections of the sound of the voice; in other words, the bottom of the groove becomes a mechanical record of the vibrations of the diaphragm, and therefore of the sounds which caused these latter. To reproduce these sounds at any future period, it is only necessary to replace the point of the style in the beginning of the grooved record and revolve the cylinder as before; the style will then set the diaphragm in vibration, and the sounds thus produced will issue from the mouthpiece, and they may be made audible to a large audience. Speech may thus be stored up for an indefinite period, and may be reproduced several times from the same record.

### The Graphophone.

This instrument is for the same purposes as the phonograph, but there are several differences in construction. It is essentially of three parts; the recorder, the cylinder, and the reproducer. The cylinder is coated with a composition of wax and paraffin, and is mounted horizontally in the phonograph. The recorder is mounted on a bar in front of this cylinder; it consists of a minute chisel fixed to a mica diaphragm, which is at the end of a flexible tube provided with a mouthpiece. On the latter being spoken into and the cylinder revolved, the diaphragm vibrates and the chisel point cuts a sinuous groove on the wax composition, which groove is an exact reproduction of the sound wave. The principal difference, therefore, between the graphophone and the phonograph is that in the former the sound is recorded by engraved sinuous grooves, whilst in the latter that is accomplished by a process of indentation. The reproducer† is a light ebonite tube, at one end of which is a mica diaphragm, which is connected by means of a fine, waxed silk thread, with a fine steel point or hook which rocks on a pivot at the end of the tube. There is an arrangement by which this reproducer can be clamped in front of the recorder, so that when the cylinder is rotated the reproducer travels at a proportionate speed, allowing the small point to rest in the groove forming the sound record, and along which it rides and vibrates, the sound being thus reproduced.

### GENERAL BUILDING NEWS.

**CATHOLIC CHURCH, ECCLES.**—The new Catholic Church of St. Mary was opened on the 15th ult. by the Bishop of Salford. The memorial stone was laid by Sir Humphrey de Trafford, on August 28, of last year. A presbytery has also been built. The church is 125 ft. long by 55 ft. wide. The height of nave to the wall plate is 34 ft., with lofty arches of 20 ft. span, without clearstory. A reredos has been presented by Lady Annette de Trafford; it has been worked by Bolton, of Cheltenham; and an east window, the gift of Miss Annette de Trafford, is by Meyers, of Munich. The church is thirteenth century in style. Messrs. Southern & Sons are the contractors; the mosaics are by Messrs. Williams; the lead-lights and some of the stained glasswork were by Mr. Chas. Lightfoot; the electric lighting by Messrs. Lomax, Kendal & Co., the art metal work by Messrs. Hardman & Powell, and the architect is Mr. W. H. Rawle (late of Heathcote & Rawle), of Manchester.

**RESTORATION OF ACTON CHURCH, CHESHIRE.**—Acton (Nantwich) Church was reopened on the 25th ult. by the Bishop of Chester, after being restored. The work of restoration was undertaken about two years ago, when Mr. S. Timmis, of Liverpool, undertook to defray the cost of restoring the nave. The estimated cost of the alterations, the carrying out of which was entrusted to Mr. H. J. Austin, architect, Lancaster, was 2,500*l.*, but the decayed condition of the fabric rendered further restoration necessary, and the total cost was increased to about 6,500*l.* The restoration embraced the removal of the wall of the north aisle, and its re-erection in the original style, the removal of the old decayed brick-lined clearstories, and the substitution of walls and windows, the erection of an oak and lead roof,

\* See last article, p. 194 *ante*, as to the vibration of membranes.  
† See "Ganot's Physics," 1897, p. 277.



the strengthening of the tower, the erection of modern oak seats in place of the square pews, and a new pulpit. The work of restoring the chancel was undertaken by Lord Tollemeache, the lay rector of Acton Church at a cost of 1,300l., the work embracing the erection of an oak roof and the re-erecting of the Jacobean woodwork which remained from a former restoration. Mr. H. J. Tollemeache, M.P., has defrayed the cost of erecting an organ chamber.

**RESTORATION OF CHURCH, STOCKPORT.**—St. Thomas's Church, Stockport, is to be restored and renovated under the direction of the architect, Mr. J. Medland Taylor, of Manchester. The work will be commenced early in October.

**RESTORATION OF NEW ALFRED'S PARISH CHURCH, HANTS.**—The parish Church of New Alfred, dedicated to St. John the Baptist, has just been reconsecrated after restoration. The original idea, according to the *Hampshire Observer*, was simply to repair the walls which had become dangerous, to remove the galleries which disfigured the church, and to extend the chancel. It was found, however, that the roof was in a dangerous state, and that nothing short of complete restoration could be attempted. Of the original Early English church all that now remains is a little window, which has been placed near the font, and one column, which has been incorporated into a three-light stained window in the chancel aisle. This window was, till the present restoration, the east window of the church, but with the enlarged chancel it was found unsuitable, and so was removed, together with the carved oak reredos. The new chancel window is of plain glass, and consists of one large central light and two smaller lights underneath. The Early English church was, Sir Arthur Blomfield (the architect for the restoration), of the date about 1200, and this gave way to a Perpendicular church about 1400. When this was burnt down in 1650 the authorities simply patched up the building in a haphazard fashion. Last year the wooden columns were found to be so rotten that their removal was imperative. When the plaster was cleared from the inside of the walls, and the stucco from the outside, the outlines were discovered of the windows of the Perpendicular church. The architect designed new windows to fill the openings thus uncovered. In one of the windows, the eastward one in the north aisle, the old stones and pieces of tracery have been used. The lower part of the old walls of the church remain, but the upper portions have been rebuilt, and the new roof is of oak throughout. The ringing loft has been raised and made sound, otherwise the tower has not been interfered with. The chancel has been extended to fit eastward. The floor of the body of the church has been laid throughout with pitch-pine blocks, and the chancel with mosaics. The north and south aisles have been by the removal of the galleries, considerably lowered. The earth outside has been cleared back, and open drains laid round to catch the water from the roof. The old flints have been largely used in the rebuilding of the walls, the buttresses being of Bath stone dressing. A somewhat unsightly brick porch has been removed from the north door, and the door itself has been renovated and polished. A new door of solid oak has been erected at the western entrance to the church. The church now consists of nave, north and south aisle, and transepts and chancel. The organ is placed in the south transept, and the vestries are at the rear of the instrument. The pillars dividing the nave from the aisles are of Bath stone. All the old tablets have been reincorporated into the walls. The total cost of the work has been about 6,000l., and Messrs. Goddard & Sons, of Farnham, were the contractors. The old pews have been discarded, and the church is now seated throughout with chairs, and a kneeler is provided for each seat. At present the choir have to sit in chairs, but it is hoped that funds will shortly be forthcoming to erect stalls. The organ has been rebuilt by Mr. G. Conduit, of Alton.

**RESTORATION OF RUSHTON PARISH CHURCH, CHESHIRE.**—The parish church of Rushton has just been reopened after restoration. The architect for the work was Mr. John Critchlow, of Leek; the contractor, Mr. W. Grace, of Leek; and Mr. Roger Lowe, of Farnworth, has laid the block flooring.

**RESTORATION OF ST. BARTHOLOMEW'S, WILMSLOW.**—On the 29th inst. the Bishop of Chester dedicated the chancel and Jesus Chapel of St. Bartholomew's, Wilmslow, near Manchester. The work has been carried out under the direction of Mr. Bodley.

**CATHOLIC CHURCH, DONAGHMOYNE, CO. MONAGHAN, IRELAND.**—The foundation stone has just been laid at Broomfield, Donaghmoynne, county Monaghan, of St. Patrick's new church. The architect of the new church is Mr. G. L. O'Connor, of Dublin. The building is Gothic in style, cruciform in plan, with nave, transepts, and sacristies. Lancet windows will be placed in the alternate spaces between the buttresses.

**IMPROVEMENTS AT FRANKFORD CATHOLIC CHURCH, TULLAMORE, IRELAND.**—At Frankford Catholic Church a new belfry and bell are being erected. The work is being carried out from plans and specifications by Mr. Walter G. Doolin, M.A., architect, Dublin.

**CHANCEL, ST. PETER MANCROFT, NORWICH.**—On the 28th ult. the new altar which has been

erected at St. Peter Mancroft was dedicated. The chancel, which has not been used for some months past—during which works of restoration have been proceeding—was reopened on this occasion. Extensive works of restoration have recently been carried out at this church. In January last the following report on the chancel floor levels was received from Messrs. W. Bucknall & G. N. Cowper, architects of Westminster, who completed the restoration of the tower some few years ago:—"The levels of the chancel floor of St. Peter Mancroft, Norwich, as they are at present, are very evidently not the original levels. They are, moreover, very detrimental to the dignity of the church. The great height of the presbytery floor, which remains very nearly at its original level, is very unusual in an English parish church. It is, of course, accounted for by the passage beneath this part of the church, which is now no longer used. Beside St. Peter Mancroft, two other notable examples of this feature in Norfolk churches may be mentioned, viz., St. Gregory's in Norwich, and the parish church of Walpole St. Peter. In both these churches the presbytery floor is even higher, and it is accounted for in the same way, viz., by the existence of a passage underneath. But, unlike St. Peter Mancroft, the levels in these cases appear to remain very much as they originally were, and they are therefore valuable examples to be borne in mind in the present instance. The chief point of difference between the levels of these two chancels and the present levels of St. Peter Mancroft is that, in the former the main flight of steps occurs eastwards of the choir stalls. Thus the higher level is confined to the presbytery, and much greater dignity is given to the whole appearance of the church. A raised presbytery was, as already implied, a thing avoided in English parish churches, while a raised choir would seem to have been unknown to them. But where the former exists it is a misfortune that the dignified effect of which it is capable should be spoilt by placing the choir stalls on the same level. It is, therefore, proposed to bring these down to what was, beyond all doubt, their original level of one or at the most two steps above the level of the nave, and at the same time to reclaim for their use the western-most bay of the chancel, which, to the great destruction of the dignity of this very fine church, has been utilised for some of the nave seats. It is quite evident from the bases of the pillars that the original levels at St. Peter Mancroft were similar to those of the above-mentioned churches. There are also indications showing that the present floor of the presbytery is at its highest part some seven inches lower than the original level. This can either be restored at the same time, or let us it is, as far westwards as the temporary wooden floor, which should in either case be removed. As regards the material of the floor and steps, we should recommend that the existing stones should be used as far as possible, and that the rest should be made up in plain stone to match. Of far more importance than any elaborate pavement is the restoration of the old levels, and the cost of a small portion of elaborate pavement would go far towards meeting the expense of this. Moreover, in the two above-mentioned churches the chancel floor is all of plain stone; and so it is in most churches of this date. And, whether their original floors were or were not more elaborate, the plain stone is eminently satisfactory, and at home in England. If, however, money for it is forthcoming, some bands of small glazed green and yellow tiles in elaborate patterns would be the most desirable form of enrichment at present at disposal for the fabric of the floor. Marble and Italian mosaic should be rejected as unsuitable to England and entirely out of keeping with this most typical English church. But we should recommend, as of the next importance to the restoration of the levels of the floor, a decoration which can be added to it in the form of some really fine and suitable ancient Oriental carpet." After discussion it was agreed by the vestry to authorise the vicar and the churchwardens to apply at the Consistory Court for a faculty for carrying out the work of the restoration of the chancel to the original levels on the lines of Messrs. Bucknall & Cowper's report, and also to form a side chapel on the north side of the church for daily service, and this has since been done, and the work completed, the chancel floor having been generally restored to what is believed to have been its original level, and the side chapel formed as desired. In the course of the operations an interesting discovery was made of a staircase leading from what is believed to have been the priest's chamber under the organ and leading up to the altar. The remains of this staircase have been preserved and an iron grating placed above them. Practically the whole of the work has been executed by Messrs. J. Downing & Son. The new altar was made by Mr. G. E. Hayes, of Norwich.

**MANSON, PERTH.**—A new mansion house is in course of erection for Mr. Rufus D. Pullar. It is built on the side of a hill on the Crief-road, about a mile and a half from Perth. The architects are Messrs. Francis W. Bedford & Sydney D. Kitson, of Leeds. The clerk of works is Mr. D. Robertson, and the following contractors are being employed upon the work:—Excavators and concrete, Messrs. D. R. Taylor, Perth; steel work, Messrs. P. & W. McLellan, Limited, Glasgow; masons' and bricklayers' work, Messrs. J. & C. Hay, Dundee; car-

penters and joiner work, Messrs. Stewart & MacFarlane, Perth; plumber and drainage work, Messrs. Frew & Son, Perth; plasterer's work, Messrs. J. Mackay & Son, Perth; glazier's work, Mr. C. Alexander, Perth; leaded glazing, Mr. W. Pape, Leeds; ornamental glazing, Mr. W. Pape and Mr. Stephen Adam, Glasgow, and Messrs. G. Walton & Co., Glasgow; electric light installation, Messrs. Ernest Scott & Mountain, Newcastle; electric bells and speaking tubes, Messrs. Westwood & Sons, Perth; ornamental plaster work, Mr. G. P. Bankart, Leicester; hot water heating, Messrs. H. Walker & Son, Newcastle-on-Tyne; casements, Messrs. Williams Brothers, Chester; lift, Messrs. John Bryden & Sons, Edinburgh; carving, Mr. J. Hayes, Edinburgh; tiling, Messrs. Field & Allen, Edinburgh, and Messrs. C. W. Williams & Co., Manchester; panellings and interior woodwork, &c., Messrs. Marsh, Jones, Cribb, & Co., Leeds; Messrs. Stewart & MacFarlane, Perth; and Mr. C. Grant, Perth.

**CLUB HOUSE, LONDONDERRY.**—Mr. Joseph Ballantine has obtained the contract for the new club house for the Foyle Rowing Club. The site of the building is on the Strand-road, with a frontage of 30 ft. to the river. The upper portion of the building will consist of an entertainment room, which will be constructed to accommodate 200 persons. The building is being erected from the plans of Mr. J. P. McGrath, C.E., architect, Londonderry.

**MIDLAND RAILWAY HOTEL, MANCHESTER.**—The Improvement and Buildings Committee of the Manchester Corporation have passed the plans for the Midland Grand Hotel, to be erected by the Midland Railway on the site now being cleared close to the Central Station. The hotel will have frontages to Peter-street, Mount-street, Lower Mosley-street, and Windmill-street. Granite is to be the material used in the lower part of the superstructure, and the main building above this will be of terra cotta. A concert hall forms a part of the design.

**PROPOSED ISOLATION HOSPITAL, LOWESTOFT.**—On the 24th ult. an inquiry was held at Oulton Board School, Lowestoft, by Mr. Samuel Walter Wheaton, M.D., an inspector of the Local Government Board, under an application by the Mutford and Longland Rural District Council for powers to borrow 2,700l. for the purpose of constructing an isolation hospital for the district. Mr. A. Smith (surveyor), and Mr. Clarke (architect), were among those present.

**PROPOSED NEW HOTEL, MUNDESEY, NORFOLK.**—It is proposed to erect a new hotel at Mundsey. Mr. H. J. Green, of Norwich, is the architect.

**PROPOSED NEW HOTEL, LLANELLY.**—At the annual licensing sessions for the Llanelly Petty Sessional Division recently, Mr. William Griffiths, architect, made application for a licence for a new hotel at Llanelly, which it is intended to erect on the site of the old Bradbury Hall, opposite the new Town Hall.

**PROPOSED NEW HOTEL, OVERSTRAND, CROMER.**—It is proposed to erect a new hotel at Overstrand. The site of the proposed building is opposite the Ivy House Farm, on the road between Overstrand and Sidestrand. Mr. Boardman, of Norwich, is the architect. There are to be twenty-three bedrooms in the building.

**UNIONIST CLUB, SOUTH SHIELDS.**—On the 24th ult. the new club which has been erected by the Unionists in South Shields was opened. The new premises are situate in Catherine-street, and have been erected from designs prepared by Mr. J. H. Morton, architect, of South Shields. The building is four stories in height. The approach from the street is through a vaulted lobby to the entrance hall, and beyond is a staircase leading to the floors above. On the ground floor there is a reading-room, whilst opposite there is a smoke-room, and in the rear are cloak-rooms and lavatories. The first floor is utilised as a billiard room, and the second floor is so constructed that it can be divided into three small rooms by means of collapsible partitions. The building is lighted throughout with electricity.

**COLLEGE BUILDINGS, NEAR NEWPORT.**—Agricultural college buildings are being erected at The Anclors, Edgmond, near Newport, for the Harper-Adams Foundation. Mr. G. I. Muirhead, of Newport, Salop, is the contractor, and Mr. H. Teather, of Shrewsbury, is the architect.

**TECHNICAL COLLEGE, DERRY.**—A new Technical College is being erected in Green-lane, Derry. The architects are Messrs. Waller & Sons, of Gloucester. **ASYLUM, INVERNESS.**—The work of connexion with the first instalment of the additions made to the Northern Counties District Asylum, at Inverness, has just been completed. The addition consists of a new male hospital ward, which cost over 12,000l. Messrs. Ross & MacBeth are the architects. Other improvements are also proceeding at the asylum, the most important of which is the addition of a female hospital. The cost of the female hospital and nurses' rooms and kitchen improvements is estimated at 15,041l., and the new boiler-house and boilers at 2,300l., making a grand total of 30,571l.

**OPEN-AIR BATH, LIVERPOOL.**—On the 26th ult. the Lord Mayor of Liverpool opened a new open-air bath which has been constructed by the Baths Committee of the Corporation in Gore-street, off Stanhope-street. The bath, situated immediately



behind St. Matthew's Church, Hill-street, occupies the site of about fifty dwelling houses which were demolished some time ago as insanitary. Together with the gymnasium it covers an area of about 1,100 square yards. The gymnasium, which will be provided with the usual vaulted gymnastic apparatus, is 44 ft. long, with an average width of 40 ft. Adjoining is a small bath, 6 ft. by 5 ft., supplied with hot and cold water, in which the lads may wash before entering the bath or using the gymnasium. Around the bath, which is only 2 ft. 6 in. deep at the greatest depth, are situated covered dressing sheds. The water in the bath is fresh water from the mains, and there is a drinking fountain for the use of the children. All the buildings are structures of red brick with terra-cotta dressings. Mr. W. R. Court the engineer and superintendent of the baths, designed the buildings. Messrs. L. Marr & Son, Liverpool, were the contractors.

**ADDITIONS TO SCHOOL, SOUNDWELL, GLOUCESTERSHIRE.**—Additions are to be made in connexion with the day schools at Soundwell. Mr. H. W. Bennett, of Staple Hill, is the architect, and the tender has been accepted of Messrs. Edwards Bros., Downend, at 1,610*l*.

**ALTERATIONS TO THE PUBLIC SCHOOL, AIRLIE, FORFAR.**—Messrs. L. & J. Falconer, Blairgowrie, have prepared plans and specifications for alterations to the public school at Airlie, and the contractors are—Messrs. Crabbe & Ballentyne; joiner, Charles Ogilvy, plasterer, George Murray; painters, Barrie & Guild—all of Kirriemuir.

**SCARBOROUGH COLLEGE.**—The foundation-stone has just been laid of this building, on the Wapenvale Estate, South Cliff. The architects are Messrs. Hall, Cooper & Davis, and the contracts have been entrusted to the following: Mr. W. Overton, brick, stone, and plaster work, 3,780*l*. 5*s*. 9*d*.; G. Seales, carpentry and joiner work, 2,500*l*. 7*s*. 5*d*.; Appleby & Brogden, ironwork, 283*l*. 10*s*. 1*d*.; G. F. Wells, plumbing work, 500*l*. 17*s*.; Joseph Hargrave, tiles, 613*l*. 6*s*. 6*d*.; Thomas Fidler, painting, 139*l*. 15*s*. 6*d*.; Mr. C. H. Fehl, of London, will do the sculpture work. The total cost—apart from the furnishing—will be about 9,400*l*.

**WORKHOUSE INFIRMARY, REDRUTH.**—A new infirmary has just been added to Redruth Workhouse. Mr. Sampson Hill was the architect.

**THEATRE, HANLEY.**—A new theatre has been erected at the corner of Trinity-street and Foundry-street, Hanley. The new building is to be known as the Grand, and it has been erected from the plans of Mr. Frank Matcham, of London. Seating accommodation is provided for nearly 3,000 persons, while on an emergency standing room can be found for several hundred more spectators. The auditorium is 75 ft. wide and 78 ft. deep, the dimensions of the stage being 63 ft. wide and 44 ft. deep, with a scene dock and property room 40 ft. by 16 ft. The width of the proscenium is 32 ft., which, by a folding arrangement, can be increased to 41 ft., and thus enable an arena for circus performances to be provided by utilising part of the pit and the stage. Externally, the building is of red brick, with stone dressings. There is an installation of the electric light, and the heating is on the hot-water system. The contractor for the erection is Mr. T. Godwin, of Hanley. The cost of the site was 5,000*l*, and the estimated cost of the building, including furnishing, is 20,000*l*. The clerk of works was Mr. J. T. F. The fibrous plaster decorations have been carried out by the Plastic Decoration Company, of London, the ordinary decorations and upholstery by Messrs. J. H. Morton & Sons, Liverpool; the iron construction by Messrs. Whitford & Co., London; the sanitary fittings by Messrs. Howson Bros., Hanley; the electric lighting fittings by Messrs. Laing, Wharton, & Co., London; the gas arrangement by Messrs. Jenkins, Leeds; the seating by T. Cavanagh; whilst Messrs. Dowson, Taylor, & Co., of Manchester, have supplied the fire extinguishing apparatus; and Messrs. Oldroyd, of Leeds, the heating apparatus.

**LUMPHANAN PARISH HALL, ABERDEEN.**—The new Parish Hall at Lumphanan, which has been erected by the Parish Council, was opened on the 26th ult. Accommodation is provided for between 400 and 500 persons, and there are cloak rooms for both ladies and gentlemen. Attached to the hall is a cottage for the caretaker. The building was designed by Mr. George Spark, Lumphanan, and the contractors were—Mason work, W. G. McRobbie, Lumphanan; slater work, Robert Wright & Sons, Aboyne; plaster work, George Morrison, Banchoy; plumber work, Messrs. Davidson & Co., Banchoy. **NEWCASTLE GUILDHALL EXCHANGE.**—After being altered and extended, the Exchange at the Guildhall, Newcastle, is about to be re-opened for business purposes. The heavy stone piers (ten in number) carrying the arches which supported the north wall and floor of the Guildhall have been removed, and the superstructure is now carried upon steel girders, rising upon four steel stanchions. The Exchange proper covers an area of 3,800 square ft., with a cubical space of 77,000 ft., and has its entrances on the north from the Sandhill, and on the south from the Quayside. On entering from the Sandhill, on the left are situated the porters' reading and manager's rooms, with latrine accommodation. Entering from the Quayside, on the left will be found the writing-room, with the Chamber of

Commerce over, the telegraph and telephone-room, with small committee-room over, and in front the smoking-room. The foregoing apartments are separated from the main Exchange by glazed screens. Increased height has been effected by lowering the old floor 2 ft. 4 in., giving a height to the Exchange of 20 ft. 6 in. The windows have been increased in size. The floors are covered with wood block flooring, supplied and fixed by Messrs. Geary & Walker, of London. The heating is by hot water on the low pressure system. The decorative fibrous plaster work has been carried out by Mr. W. R. Dodds, of Jarrow, the general contractor being Mr. Thomas Lumsden, of Jarrow. The work has been carried out from the designs and under the supervision of Messrs. Armstrong & Knowles, architects, Newcastle.

**HOME (CATHOLIC), NEWRY.**—In order to provide sufficient accommodation for the Roman Catholic male aged poor and orphan children, a building is being erected at the rear of the existing Home, Kilmorye-street. It is to be set apart for the sole use of the Sisters of Mercy. Mr. John Brown, architect, Newry, prepared the plans for the new structure, and Mr. Denis Neary, Newry, is the contractor for the work.

**PROPOSED NEW THEATRE FOR BLYTH, NORTH-UMBERLAND.**—Arrangements are now in progress by the Blyth Theatre Company, Limited, for the erection of a new theatre, on ground in close proximity to the present theatre at Watford, Blyth. The plans have been prepared by Mr. Hope, architect, of Newcastle. The auditorium of the new building will be 67 ft. from the curtain line to the back of the pit and 66 ft. 6 in. wide. There are to be two tiers—the circle and the gallery. It is estimated that the theatre will seat 2,500 persons.

**ALTERATIONS TO HOTEL, DUBLIN.**—Some alterations have just been carried out at the Burlington Hotel and Restaurant, St. Andrew-street, Dublin. The contractor is Mr. James Pile, and the architect, under whose supervision the additions and alterations have been carried out, is Mr. J. J. O'Callaghan.

**WORKMEN'S COTTAGES, PENSURST.**—In response to the advertisement recently inserted in the *Builder* by the Rural District Council of Sevenoaks for workmen's cottages for Penshurst, 113 applications for particulars were received and sixty sets of drawings sent in. Mr. Edgar Wood, F.R.I.B.A., of Manchester, was the professional adjudicator appointed by the Council, and he has selected the designs of Utility (on a tablet\*) by Messrs. Taylor & Sons, of Aylesbury, subject to certain modifications, as most suitable to the requirements of the Council.

#### SANITARY AND ENGINEERING NEWS.

**WATER SUPPLY, HUNTLY, ABERDEEN.**—The new works in connexion with the additional water supply for Huntly were inaugurated on the 24th ult. The works were designed by Mr. James Barron, C.E., Aberdeen, and carried out by Mr. J. Hunter Clark, Elgin.

**SEWAGE DISPOSAL, KIRKBURTON, YORKSHIRE.**—The Kirkburton Urban District Council have had before them since last May competitive schemes from several engineers for the complete re sewerage and sewage disposal for the whole of their districts of New and Old Birkbecks. At a meeting held the other day to finally decide the question it was resolved that the scheme submitted by Mr. T. Aird Murray, C.E., of Sheffield, be accepted, and that he be appointed engineer to the Council to carry out the scheme.

**PROPOSED SHIP CANAL FROM THE GREAT LAKES TO THE HUDSON.**—The British Consul-General in New York mentions in his last report that a preliminary examination has been made for a ship canal from the great lakes to the navigable waters of the Hudson River of a sufficient capacity to transport the tonnage of the lakes to the sea. In the report on this subject three routes are stated to be possible. First, from Lake Erie by the Upper Niagara River to the vicinity of Tonawanda or Lassalle, thence by canal with locks to the Lower Niagara River to some point on Lake Ontario, through Lake Ontario to Oswego, up the Oswego and Oneida rivers to Oneida Lake, through the lake and across the divide to the Mohawk River, and down that river to the Hudson at Troy. The second route follows the line of the Erie Canal from Lake Erie and the Niagara River through to the Hudson, or this line so modified as to provide a continuously-descending canal from Lake Erie to the Hudson. The third route coincides with the first from Lake Erie to Lake Ontario, running thence through Lake Ontario to the St. Lawrence River, and down that river to some point near Ogdensburg, crossing the State of New York to Lake Champlain, up the lake and then following in general the route of the Champlain Canal to the Hudson at Troy. The relative merits of these routes are discussed in the report, and the first is considered the best; but the cost of construction is estimated at about 400,000,000*l*, and the cost of maintenance at about 400,000*l* a year. It is stated that such a canal would have no military value, and that it is not advisable that its construction should

\* Six designs under the motto "Utility" were sent in.

be undertaken by the Government. The opinion is expressed that if, beyond the improvements now being carried out under existing plans, the Erie Canal be further improved so as to be made navigable for 1,500-ton barges, necessary alterations being made in its alignment so as to give a continuously-descending canal from Lake Erie to the Hudson, and the Mohawk River be canalised, this would enable cargo to be transported from east to west at a cheaper rate than by a ship canal, and that the cost would be approximately one-fourth that of a ship canal.—*Times*.

#### FOREIGN.

**FRANCE.**—A fine ceiling painting, representing "The Seine and its Tributaries," has been placed in the Tribunal of Commerce at Rouen. It is the work of M. Baudouin, a pupil of M. Puvis de Chavannes.—M. Marquiset, of Laon, has been elected President of the Société des Architectes de l'Aisne for 1898-99.—The new Bonnat Museum, at Bayonne, is nearly finished, and will be opened early next year.—A statue to Volney is to be erected at Craon (Mayenne) on the 10th inst.—The death is announced, at the age of fifty-four, of M. Henri Ding, sculptor, and Director of the Ecole de Sculpture at Grenoble. He was an artist of no ordinary powers. A figure of Christ which he exhibited at the Salon gave rise to a great deal of warm discussion in the artistic world. He was the author of the monument erected at Vizille in memory of the meeting of the States-General, and which was inaugurated in 1885. He was also author of a monument to "La Gaieté de la Révolution," erected last year at Grenoble. The capital possesses a charming work from his hand, the "Enfant à la Source," in the garden of the Hôtel de Ville.—The death is announced also of the etcher Felicien Rops, an artist of very individual talent. He was a Hungarian by birth, but French by adoption. He first became known at Brussels, forty years ago, by various caricatures and lithographs, one of which, "Un Enterrement au Pays Wallon," obtained a great success. He then took up etching, and executed interior studies in the Dutch school. Unfortunately he made a less desirable kind of reputation by engravings of an immoral character.

#### MISCELLANEOUS.

**TECHNICAL SCHOOLS FOR BOOTLE.**—At the Bootle Town Hall, on the 23rd ult., Colonel W. E. Slacks, R.E., held an inquiry relative to the application of the Town Council to the Local Government Board for approval of the borrowing of 15,351*l*. for the erection of a technical school. The Town Clerk said there was no technical school existing in the borough other than that carried on under the Corporation. At present the school was conducted in rooms in the basement of the Free Library and Museum. It had been used as a technical school since 1891. But science schools had also been held there since 1887. They were not only inconvenient, but insufficient for the purpose. The site adjoining the Town Hall, and had been purchased by the Corporation, under the sanction of the Local Government Board, in February, 1897. The site comprises 3,106 square yards. The frontage to Balliol-road is 208 ft. and Pembroke-road 103 ft. The plans accepted were those of Messrs. Best & Callon. Twenty-two plans were received in competition. The cost of the building will be 20,000*l*.

**RECONSTRUCTION OF TOWN HALL, LIVERPOOL.**—At the last meeting of the Finance Committee of the Corporation, a report from the City Surveyor as to the condition of the roof of the large ballroom at the Town Hall was approved, and it was decided, if necessary, to have the roof and ceiling reconstructed, at a cost not exceeding 3,000*l*. It is understood that a serious development of dry rot was discovered in the roof, though unfortunately this was not ascertained until the work of redecorating the present ceiling was well in hand. The extra outlay is in addition to the 8,000*l*. already voted for certain alterations and redecoration of the Town Hall. It was hoped that the work originally sanctioned would be completed at the beginning of September, but the reconstruction of the ballroom ceiling will keep the place in the hands of the workmen for some two or three months longer.—*Liverpool Post*.

**ARCHAEOLOGICAL DISCOVERY.**—A discovery has just been made on the banks of the Clyde, at a spot between Dumbarton Rock and Duglass. Through the efforts chiefly of Mr. Donnelly, artist, of Bowling, what is supposed to be a lake dwelling, or crannog, has been found there. It is thought that the remains belong to the same period as the occupation of the neighbouring hill fort of Dunbride, discovered a couple of years ago. The officials of the Helensburgh Antiquarian Society, who carried through the Dunbride excavations, have undertaken to make a thorough investigation of the supposed crannog.

**"RIDLER'S" HOTEL, HOLBORN.**—These premises are being pulled down for the extension of the Prudential Assurance Company's offices.—Mr. the Waterhouse, R.A., architect. "Ridler's" formerly the "Bell and Crown" was an old-established hostelry, standing next (east) to Furnival's Inn. The yard was built over long ago. The "Bell and



Crown" was the starting place of the mails to Southampton and Louth, and of various stage-coaches, including those which ran to Dover, Stamford, and Banbury.

**THE ARCHBISHOP'S HOUSE, WESTMINSTER.**—It is stated that this house, in Carlisle-place, Vauxhall Bridge-road, will shortly be pulled down, the site having been taken for a block of residential flats. Originally built as a club-house and library for the Guards' Brigade, it was purchased, 1873, as a residence for the Archbishops of Westminster, and was occupied during many years by the late Cardinal Manning until his death on January 14, 1892. In this house was preserved the white silk mitre worn by Thomas à Becket at Sens.

**LEEDS MASTER BUILDERS' ASSOCIATION.**—The annual meeting and excursion of the members of this Association took place on the 25th ult. at Studley Royal. The gathering was held in the ruins of Fountains Abbey. Mr. W. Nicholson, the retiring President, occupied the chair. The annual report, submitted by Mr. Ernest Schofield (hon. sec.), stated that the membership of the Association had doubled since 1896. Notices for alteration of rules had been received from the masons and joiners, but amicable settlements had been arrived at in both instances by agreeing to have a standing committee. Notice, however, must be given in November, so that the arrangement might be properly entered in the rules. The statement of accounts showed a balance in hand of £11,28.7d. The Chairman, in moving the adoption of the report, said that certain modifications had been made in the rules, one of which was the formation of a standing committee to settle all disputes; with a 49½ hours' working week. The joint standing committee were empowered to settle all threatened strikes or lock-outs. The state of the trade, it was a mistake for the public to think that builders were making their fortunes, because the increased cost of labour and materials had to be taken into account. They had also to remember that some of their contracts had been entered into some time ago, and might entail losses upon them. The last year had been a rather eventful year for the building trade, as it had seen the passing of the Workmen's Compensation Act, a measure which pressed heavily upon them. To meet this Act the builders had an insurance society, which was steadily increasing in membership. The position taken up by the labour party had forced the employers to form a federation for their own protection and for the benefit of the trade, but not for the purpose of fighting the men.—Mr. W. Irwin seconded the motion, which was adopted. Mr. Walker, of Armley, was elected President for the ensuing year, Mr. W. H. Dewis vice-president, Mr. W. C. Ellison permanent secretary, and Messrs. Myers, Pickard, Irwin, Nicholson, Atkinson, Rhodes, Umpleby, and Schofield the committee, with Messrs. Season and Umpleby auditors. Votes of thanks were accorded to the retiring President and Hon. Secretary for their services.

**SCHOOL OF ART WOOD CARVING.**—We are requested to state that the School of Art Wood Carving, which has hitherto been held in the Central Technical College, South Kensington, has now been removed to the Imperial Institute, where rooms have been granted for its use, and where it will be reopened, after the usual summer vacation, on Monday, September 5. Free studentships, in both the day and evening classes of the School, are maintained by means of funds supplied by the City and Guilds Institute for the Advancement of Technical Education, and by the Drapers' Company. Some of these studentships are at present vacant, and forms of application for them, also information as to the School generally, may be obtained by letter addressed to the Manager, School of Art Wood Carving, Imperial Institute, London, S.W.

**ELECTRIC LIGHTING SCHEME, LEITH.**—The ceremony of laying the last brick on the top of the new chimney in connexion with the electric lighting station, now in course of erection at Junction-street, Leith, was performed on the 24th ult. Among those present were Bailie Manclark, Mr. W. Bryson, Electrical Engineer for the Corporation; Mr. Campbell, Deputy Town Clerk; and Mr. G. Simpson, Architect. Bailie Manclark was present on behalf of the builders, Messrs. Kinneir, Moodie, & Co., with a silver trowel. The chimney is 155 ft. in height, 18 ft. in diameter at the base, and 12 ft. in diameter at the top, with an internal diameter of 8 ft. 3 in. at the bottom, and 9 ft. 3 in. at the top. There is an internal shaft of fire brick to the height of 100 ft., built entirely independent of the outer walls of the chimney, having a space all round. This shaft is to bear the heat of the boiler gases, and the advantage of the space is that fresh air is admitted at intervals, which keeps the outer wall of the chimney cool, and prevents the possibility of cracking from expansion and contraction.—*Scotsman.*

**YORK ARCHITECTURAL SOCIETY.**—A party of members of this Society recently paid a visit to the district of Kirkham Abbey, and were enabled, through the courtesy of Mr. H. W. Cholmley, to visit Howsham Hall. This building is situated on high ground overlooking one of the most beautiful parts of the valley of the Derwent, and is approached from the lodge at Howsham Bridge by a carriage drive. According to tradition it was erected by Sir Thomas Hamburg, during the early part of the reign of James I., of stone brought from the neigh-

bouring abbey of Kirkham, but alterations were made about 1770, probably about the time the family left their ancient seat at Whitby, and made Howsham their chief country residence. The party proceeded by way of Barton-le-Willows, and were met on arrival by Mr. Mansfield, who conducted them through the chief apartments, which contain a number of valuable portraits and other paintings. The village of Howsham, which adjoins the gardens, is most picturesque. The church is modern.—*Yorkshire Herald.*

**REPAVING OF THE STRAND.**—The repaving of the Strand with creosoted deal wood blocks has been accomplished. The work was carried on night and day, one gang relieving the other at the end of the shift. The portion of the Strand from Terry's Theatre to the Hotel Cecil was opened on August 25, and a further portion to Adam-street on the following day. From Terry's Theatre to the west side of King William-street, which was commenced on August 15, was opened for traffic on the 29th inst.

**DUNDEE INSTITUTE OF ARCHITECTURE.**—The Hon. Secretary writes to point out, in reference to our notice of the Report of this Institute in our last, that the President's address referred to was not that of Mr. Caddon, but of the last year's President, Mr. Leslie Ower.

**PRESTON BOROUGH SURVEYORSHIP.**—The special committee appointed to consider the filling up of the post of Borough Surveyor, vacant by the death of Mr. Hudson Keah, have recommended to the Council the appointment of Mr. Thomas Cookson, who has for some years held the position of Assistant Surveyor.

**NEW LINING BRICK FOR SWIMMING BATHS.**—In reference to the paragraph on this in our last issue (p. 197 ante) the Farley Iron Co. write to say that they are not the patentees but only the manufacturers. The patentees are Messrs. Balaam Bros., London. No intimation to this effect was given on the circular sent us.

**ST. CLEMENT DANCES.**—It is proposed to commemorate Dr. Johnson's membership of the congregation by placing, by subscription, a stained glass window in the church, at an estimated cost of 120l. Dr. Johnson's pew is in the north gallery, at the east end, and some years ago was marked by a brass tablet, set up at the expense of some of the parishioners.

### CAPITAL AND LABOUR.

**THE BRICKLAYERS' LABOURERS' STRIKE, SHREWSBURY.**—For about three months the bricklayers' labourers of Shrewsbury have been on strike. They received 5d. per hour, and asked for 5½d. This the master builders refused, and offered 5½d., which was at the time declined, and the offer was subsequently withdrawn. A settlement has, however, been arrived at, the men agreeing to accept the farthing advance, and the masters consenting to give it.

### LEGAL.

#### A PONTEFRACCT ARCHITECT'S CLAIM.

At Pontefract County Court, on the 26th ult., Judge Raikes was occupied for several hours in hearing a claim brought by Messrs. J. H. Greaves & Co., architects, Pontefract, Castleford, and Goole, to recover 23l. 9s. 2d. from Messrs. Wigfall & Sons, brushmakers, Pontefract, balance of account for services rendered. Mr. Kemp was for the plaintiffs and Mr. Schofield for the defendants. Mr. J. O. Greaves, of Wakefield, sat with his Honour as assessor. The claim was in respect of the preparation of plans, &c., for the rebuilding of the defendants' works after their destruction by fire. Mr. Greaves' original estimate was for 2,000l., but the specifications were cut down until the tenders accepted amounted to 917l. Even then, Mr. Wigfall, by striking down item after item, pared the total down to 731l. 14s. 7d. Mr. Wigfall then required plans of the conversion of a portion embraced in the original plans into a dwelling-house, and, as he refused to await the sanction of the Corporation before proceeding with the work, Mr. Greaves was put, it was claimed, to very great trouble. His Honour reduced the claim by 6l. 6s. 6d., and judgment was given for 141. 2s. 8d., less 3l. 12s. 3d., paid into Court.—*Sheffield Telegraph.*

#### "ARCHITECTURE" IN COURT.

MR. JUSTICE PHILLIMORE, sitting as Vacation Judge, on the 21st ultimo had before him the petition of Carl Hentschel & Co. for the compulsory winding-up of "Architecture," Limited.

Upon the case being called on, counsel for the petitioning creditors asked that the case might be allowed to stand over for a week, saying that he understood there was a probability of somebody coming forward to take over the whole of the assets.

His Lordship: Does anybody object?

The learned counsel replied in the negative. He (the learned counsel) thought it right to mention that the statutory affidavit in support of the petition was filed out of time, and in the affidavit of service there was nothing to show that service had taken place on a servant of the company, although such service took place at the registered office of the

company. Another point to which His Lordship's attention should be called was that the petition was advertised as being a petition for winding-up under the supervision of the Court, whereas it was for a compulsory winding-up.

His Lordship directed that the case should stand over for a week, the petition in the meantime to be re-advertised in the *London Gazette* and *Standard*. His Lordship waived the other points mentioned by counsel, but directed that the affidavit of service should be corrected.

#### THE BRIGHTON ANCIENT LIGHTS CASE.

THE case of Smith v. Costerton again came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 31st ult., on a motion by the plaintiff, the owner of No. 12, Gloucester-place, Brighton, for an injunction to restrain the defendant, the owner of the next house, from building in the rear of his premises so as to darken or interfere with the plaintiff's ancient lights.

Upon the case being called on, counsel stated that the case had now been settled on terms satisfactory to both parties.

#### ANCIENT LIGHTS DISPUTE.

THE case of Warton v. Poulter, Limited, and Others, came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 31st ultimo, on a motion by the plaintiff to restrain the alleged interference with his ancient lights through the erection of a wall by the defendant.

When the case was reached, counsel for the plaintiff asked that the case might be allowed to stand over for a week, the defendant undertaking in the meantime not to proceed further with the wall in question without prejudice.

His Lordship granted the application.

#### ALLEGED INTERFERENCE WITH ANCIENT LIGHTS.

THE case of Webster v. Raphael Tuck & Sons, Limited, on the 31st ult., came before Mr. Justice Phillimore, sitting as Vacation Judge, it being an application by the plaintiff to restrain the defendants from erecting a building so as to interfere with the plaintiff's ancient lights.

When the case was called on, counsel for the plaintiff asked that the motion might be allowed to stand over for a week, in order to complete an agreement for a compromise.

His Lordship acceded to the application.

### MEETINGS.

WEDNESDAY, SEPTEMBER 7.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

### RECENT PATENTS:

#### ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until October 10.

1897, 19,344.—**REMOVAL AND PREVENTION OF SCALE AND PROTECTIVE COATING ON THE INSIDE OF BOILERS.** *T. & G. H. Swift.*—The composition is made of Irish moss, carbonate of potash, soft soap, tallow, (1 lb. each), Stockholm tar (3 lbs.), soda crystals (13 lbs.), and kerosene oil (2 pints); the Irish moss is first boiled for three hours in 10 gals. of fresh water, the other ingredients are then added, and the whole is boiled down to 8 gals. Quantity, ½ pint per 1-horse power; the claim is for the action of the moss when incorporated with the other ingredients.

20,414.—**GLASS TILES.** *W. Thomson.*—The back or one side of the tile is coated with a mixture forming a cement or enamel composed of a solution of soluble glass mixed with an insoluble silicate or with oxide of zinc or other like base, or with both, for the purpose of forming a key for attachment.

22,090.—**COMBINED WATER-CLOSET AND SINK.** *J. & S. H. Dibble.*—The invention is for an improvement of their patents 18,086 and 26,102—1896, by placing a trap-door at the outlet pipe's mouth (when near or under the sink) to prevent the wind from reaching the sink. The trap-door is opened by the flow of water from the sink, and closed by its own weight. For the gully-bow of their latter specification they provide a hinge and joint, and an outside door to prevent choking of the gully-trap by snow, &c.

22,681.—**WATER SUPPLY AND DISCHARGE APPARATUS, AND OTHER PARTS OF LAVATORIES, SINKS, &c.** *J. Sharkey.*—The several claims are for (a) a horizontal frame, fixed to a wall, and fitted with rubber studs on its inner sides for carrying the basin, which has an overflow gutter and a drainage passage, or with an outlet whose valve is moved by a lever or treadle; (b) attaching the supply valve apparatus to a wall-pipe under the basin, fitting the supply pipes to the valve-box, communicating through separate spaces and inlet ports with a middle space connected to an inlet in the basin, the supply valves closing upwards by springs, and opening downwards by the action of foot-levers; (c) making the discharge outlet at the back part of the basin in a recessed space, the discharge valve valve in the form of a hollow plug, and worked by treadle or other action. The improvements are adapted for hospital use, when handling of the valve-mechanism should be avoided.

22,837.—**COMBINED STOPPER AND CONNECTOR FOR SEWERS, DRAINS, &c.** *E. A. Sandford Fawcett.*—The end of the branch or pipe to which a connection may have afterwards to be made is closed with a disc preferably made in one piece with the pipe or socket, a notch being



[illegible]



Ventilators, 17,802, H. Whiteley, Sliding Partitions, Doors, Windows, &c., 17,817, C. P. Kirsten, for Signaling Deficient Flow of Water and Increase of Temperature in Liquids Flowing through Pipes, 17,822, L. de L. Wells, Pumps, 17,825, G. Little, Gas-retort Settings, 17,844, W. H. Corlyon, Holder for Clamping Stair Carpet, 17,850, J. Evans, Checking Bricks for Hot-Blast Stoves, 17,859, T. R. Blackmore, White-lead Colour Mixer or General Oil and Water Colour Mixer, 17,870, H. G. Glazebrook, Apparatus for Giving Assistance in Reproducing Drawings, 17,879, M. J. Davidson, Mills for Mixing Cements, &c., 17,890, S. P. Hyatt, Glazing Windows, 17,918, L. Stork, Automatic Duplex Brick-making Machines, 17,931, T. C. Fawcett, for Feeding Pottery from Plaster Moulds and Applying Mechanism, 17,950, J. H. Wilson, Safety-locks, and their Electrical Appliances, 17,951, G. Hodgkinson, Glazing Roofs and Similar Parts of Buildings, 17,970, F. Brunt, Friction-clutches, 17,973, C. E. S. Phillips, Induction Coils or Transformers, 17,980, British Non-flammable Wood Co., and Another, Wood-drying, 17,981, C. T. Porter, Gearing, Lathes, and boring-mills, 17,990, C. T. Twer, Wrought-iron Gas-pipes, and their Manufacture.

## SOME RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

August 10.—By J. FRANCIS (at Tenby).  
Mary-on-Liberty, Pembroke.—Knightson  
Lake Farm, 10 a. 3 r. 1 p. f. £605  
Rumley Farm, 40 a. 0 r. 12 p. f. 1,300  
A house, smiddy, and o. a. 0 r. 3 p. f. 1,350  
Enclosures of land, 2 a. 3 r. 35 p. f. 140  
Fifteen plots of building land, 2 a. 1 r. 1 p. f. 200  
Farm buildings and o. a. 2 a. 1 r. 1 p. f. 1,000  
St. Mary-in-Liberty, Pembroke.—2 a. and 4 to 8  
The Green, and the "Evergreen Inn," ut. 17  
178, g. 41, 48, r. 63, 108  
"The Five Bells Inn," and Myrtle and Oak Cottages, 3 a. 2 r. 3 p. f. ut. 178, g. 57, 58, 59, 385  
August 11.—By BATHURST & SON (at Crofton).  
Crofton.—South End, a building site, nearly 10 a. 0 r. 1 p. f. 1,150  
Moland-road, Burnham, f. 800  
August 13.—HEWITT & LEE (at Guildford).  
Julliford.—140, High-st., and the Constitutional Hall adjoining, f. 2,750  
August 16.—By MORRIS, MARSHALL, & POOLE (at Newtown).  
Dolfor, Montgomery.—Brook House and 7 a. f. 300  
Kerry, Montgomery.—6 a. 0 r. 12 p. f. 1,000  
Llanerwg, Montgomery.—The Llanerwg Smithy and 2 a. 3 r. 10 p. f. 275  
By POCOCK & DAVIES (at Newport).  
Great Chatwell, Stafford.—Great Chatwell House Estate, 167 a. f. 7,450  
August 16.—By GRADWILE & SONS.  
Lincoln's Inn Fields, 155, Sandringham, and 26 and 28, Veres-st., area 3,070 ft. f. 4,005  
Kensington.—23, Bedford-gdns., ut. 25 yrs., g. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

By H. DUKE & SON (at Bridport).  
Shipton Gore, Dorset.—St. Luke's Farm, 40 a. 3 r. 15 p. f. £1,000  
Upper Lodges, Dorset.—Enclosures of land, 1 a. 2 r. 20 p. f. 450  
By MORRIS, MARSHALL, & POOLE (at Newtown).  
Newtown, Montgomery.—The Bank and the Bank House f. 1,387  
4, 5, and 6, Bridge-st., f. 1,447  
21 to 25, Severn-st., with three cottages and land on premises in Parker's-lane, f. 1,450  
34, Park-st., f. 1,401  
Llanllwyllyn, Montgomery.—Llanllwyllyn Farm, 53 a. 1 r. 2 p. f. 1,500  
By E. S. SWINDER & SONS (at Royston).  
Reed, Herts.—Reed Hall Farm, 127 a. 3 r. 25 p. f. 2,500  
Enclosures of land, 21 a. 3 r. 15 p. f. 330  
Five freehold cottages and 1 a. 3 r. 21 p. f. 400  
Barley, Herts.—Shaftesbury End Farm, 33 a. 1 r. 28 p. f. and 2 r. 12 p. f. and C. 235  
Three cottages and a. 2 r. 12 p. f. and C. 235  
Three enclosures of land, 8 a. 1 r. 21 p. f. and C. 235  
August 25.—By HAWES & CO.  
Wimbleton.—1, Kaynes Park-ter., ut. 27 yrs., g. 1, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

## TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than 10 a.m. on Thursday. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £200 unless in some exceptional cases and for special reasons.]

AYLESBURY (Bucks).—For alterations and repairs to Walton Villa, Aylesbury, for Mr. T. Howard. Mr. Ernest Hazell, architect, 23, Moorgate-street, E.C. 4. £1,000  
Seth Grist, Limited. £1,000  
J. S. Holland. £1,000  
Accepted.

BRENTWOOD.—For re-joining the boys' playground at Hackney Wood, Brentwood, Essex, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 7, Finsbury-pavement, E.C. 4. £100  
Barrett & Power, Hackney. £100  
Accepted.

BURNLEY.—For additions to the workshop for the Union Guardians, Mr. S. Kedgey, architect, Nicholas-street, Burnley. £200  
Masonry and Bricklaying.—Smith Bros., Burnley. £200  
Joinery.—Nuttall & Whitaker, Burnley. £200  
Slatting.—William Saworth, Burnley. £200  
Concrete.—The Iron Fireproof Company, Manchester. £200  
Plumbing.—George E. Whitehead, Burnley. £200  
Painting.—Jas. Holt, Burnley. £200

HONINGTON.—For erecting a new bank for the Devon and Cornwall Banking Company, at Honington, Devon. Messrs. Rilling & Tonar, architects, Bedford-street, E.C. 4. £200  
Plumbing.—H. Hainsworth, 85, Cannon-street. £200  
Masonry.—Wrigglesworth,



LONDON.—For alterations and repairs to No. 31, South Audley-street, Piccadilly, W., for Mr. W. T. Mr. P. A. Todd, architect:—  
W. H. Kelland ..... £79 R. S. Buckenridge ..... £503  
Spicer & Son ..... 79

LONDON.—For erecting new school buildings for St. John's, Bethnal-green, E. 1, for the Rev. E. T. Halling, Mr. A. Cox, architect, 35, Baker-street, W. Quantities by Mr. E. Clarke, 35, Baker-street, W. :—  
McConnell & Sons ..... £565  
Shummar ..... 565  
Chesnut & Son ..... 689  
Harris & Wardrop ..... 637  
Knight & Son ..... 634  
H. Wall & Co. .... 679  
Cattwaite & Son ..... 679

LONDON.—Accepted for the erection of new clubhouse at Quay, for the Trustees of Foyle Rowing Club, Foyle-street, Derry:—  
Joseph Ballington, Londonderry [The lowest of four tenders] ..... £590

NAZING.—For the erection of a villa residence at Old House Farm, Nazing, Essex, for Mr. John A. Rufus, Mr. J. Williams, Dunford architect, 20, Queen Victoria-street, E.C. :—  
Lawrence ..... £1,293  
Matthews ..... 1,293  
Burridge ..... 1,030  
Hampton ..... 010  
\* Accepted.

NEWPORT (Mon.).—For the rebuilding of Central Schools, Towns place, for the School Board, Messrs Morgan & Hodge, architects, 1, Leamington-street, Newport:—  
T. G. Diamond ..... £1,181  
J. E. Richards ..... 1,181  
Jno. Moore ..... 2,816  
J. Phillips & Sons ..... 2,457  
Lionel Linton ..... 2,014  
C. H. Roy ..... 2,409  
Smith Bros. .... 2,604  
Jas. Davies ..... 2,769  
J. C. Jordan ..... 2,291  
Tem Westcott ..... 2,340  
W. A. Linton ..... 2,461  
D. J. Morris ..... 2,902  
Win. Moore ..... 2,990  
J. Charles ..... 2,541  
\* Accepted.

NEWSTEAD (North).—For the erection of Wesleyan Chapel and boundary walls, Mr. J. E. Goodacre, architect, Stockwell Gate, Mansfield:—  
Greenwood ..... £1,500  
J. E. Price ..... 1,500  
Gibber & Gibber ..... 1,480  
Wm. Ripley ..... 1,470  
W. B. Bains, East Kirkby ..... 1,330  
\* Deducting class rooms; accepted at £1,330 10s.

NORTHWOOD (Middlesex).—For the erection of a house, for Mr. Sumpter, Mr. W. A. Alkman, architect, 31, Gresham-street, E.C. :—  
F. Hill ..... £2,741  
C. I. Ames, Watford ..... 2,741  
\* Accepted.

PLYMOUTH.—For the rebuilding of a store at the rear of George-street, for Messrs. Hicks & Co., Messrs Keats & Co., Adams, architects:—  
Guthrie ..... £749 19  
Goed & Co. .... £700  
Andrews ..... 735  
Leithbridge & Son ..... 645  
Pearn & Son ..... 645  
(All of Plymouth) \* Accepted.

PRESTON (Lancs.).—For additions to a skin-house, Fulwood, for the Union Guardians, Mr. Whitwell, Engineer, Union Office, Preston:—  
Contract No. 1.—Building.

Wm. Hatherall ..... £1,799 0  
J. J. Cartmell & Son ..... £1,537 0  
Tapping Brothers ..... 1,570 0  
M. Shorrocks, Preston ..... 1,570 0  
Fazackerley ..... 1,570 0  
Contract No. 2.—Fitting and Ventilating.  
B. D. Holmes ..... £550 0  
Dawson & Co., Ltd. .... £435 0  
Darque, Griffiths, & Co. .... 487 11 0  
Preston (accepted) ..... 422 0

SOUTHAMPTON.—For the execution of private street works, Regent's Park-road, &c., for the Corporation, Mr. W. B. G. Bennett, Borough Engineer, Municipal Offices, Southampton:—  
Contract No. 1.—Road.

W. H. Bull ..... £3,688 0  
F. Osman, South ..... 3,375 0  
S. Nichols ..... 3,375 0  
Contract No. 2.—Road.  
W. H. Bull ..... £1,791 7 9  
F. Osman, South ..... 1,686 0  
S. Nichols ..... 1,686 0  
\* Accepted.

## C. B. N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT, Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, BAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE. Telephone No. 714 Holborn. Tel. Address: "SNEWIN, London."

STROOD (Kent).—For the erection of an assembly hall, Cliffe-road, for the trustees of Strood Wesleyan Church. Messrs. J. W. Nash & Son, architects, Rochester. Quantities by the architects:—  
R. E. Valler ..... £1,039 4 0  
E. W. Piley ..... £1,425 0 0  
E. D. Seagar ..... 1,410 0 0  
H. E. Phillips ..... 1,410 0 0  
J. Willard ..... 1,414 0 0  
J. L. Tusman ..... 1,407 0 0  
C. E. Skinner ..... 1,412 0 0  
H. Wyles, Chatham ..... 1,415 0 0  
\* Accepted.

SWINDON.—For the erection of a shop, house, dairy, &c., Radnor-street, for Mr. A. C. Buckle, Mr. R. J. Bewick, architect, 9, Regent-street, New Swindon:—  
C. Williams ..... £2,499 10 0  
W. Chambers ..... 2,499 10 0  
J. Williams ..... 2,499 10 0  
Ball & Kilmister, Kent-road, Swindon (accepted) ..... 1,713

THEYDON BOIS.—Accepted for the erection of dairy, &c., at Theydon, Theydon Bois, Essex, for Mr. E. A. King, Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. :—  
S. R. Lambie, Kentish Town ..... £395

WALTHAMSTOW.—For alterations and additions at the Victoria Hall, Hoe-street, Walthamstow, and building new Empress Theatre adjoining, for Messrs. Charles G. Mailey and Warwick Backland, Mr. Bertie Crew, architect, Savoy Mansions, Savoy. Quantities by Mr. Harry E. Pollard, 17, 25, Buildings, Adelphi:—  
Jennings & Son ..... £17,566  
Johnson & Co. .... £16,562  
Patterson & Fotheringham ..... 17,085  
Bateman ..... 15,997  
Kilby & Gayford ..... 15,990  
Gray, Hill, & Co. .... 15,990  
Knight & Son ..... 15,911  
W. Pattinson & Son ..... 15,743

WANSFORD.—For additions, &c., to a house, for the Wansford-in-England Lodge of Oddfellows, Mr. J. C. Tyein, architect, No. 16, Strand, Stamford:—  
L. C. Gilbert ..... £2,715  
Coates & Son, Thrapston (accepted) ..... 2,715

WHITCHURCH (Devon).—For the erection of greenhouses at "Hollybank," the residence of Mr. Edmund Coppin, Messrs. Keats & Co., Adams, architects:—  
H. B. Page, Haverhill ..... £370

### TO CORRESPONDENTS.

C. C. D.—J. S. M. & Son.—W. H. R. C. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

It cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and sent to the Editor.

## J. J. ETRIDGE, Jr.

SLATE MERCHANT, SLATER and TILER.

ESTIMATES GIVEN FOR SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor, Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to BETHNAL GREEN SLATE WORKS,

BETHNAL GREEN, LONDON, E.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances (payable to DOUGLAS FOURDRINER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS (by prepaying at the Publishing Office, 10s. per annum or 4s. 6d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

### THE BATH STONE FIRMS, Ltd.

BATH, FOR ALL THE PROVED KINDS OF BATH STONE. FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

### HAM HILL STONE DOULTING STONE.

The Ham Hill and Douling Stone Co. (Incorporating The Ham Hill Stone Co. and C. Trask & Son The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-Ham, Somerset. London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallurgique Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C. —The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, sun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

SPRAGUE & CO'S, Ltd., INK-PHOTO PROCESS, 4 & 5, East Harding-street, Fetter-Lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

METCHIN & SON (8, PRINCES STREET, ST. GEORGE'S ST. WESTMINSTER) "QUANTITY SURVEYORS" DIARY AND TABLES, For 1898, price 6d. post 7d. In leather 1/- Post 1/4 [ADVT.]

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C. SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS, DAMP COURSES, AREAS, ROOFS, WASHHOUSE AND DAIRY FLOORS &c., &c.

This Asphalte was chosen to be laid at Sandringham, on the new General Post Office, and other important buildings.

### TWELVE GOLD AND SILVER MEDALS AWARDED.

# IRON CISTERNS.

## F. BRABY & CO.

VERY PROMPT SUPPLY.

LARGE STOCK READY.

Particulars on application.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL: 6 and 8, HATTON GARDEN.

GLASGOW:

47 and 49, ST. ENOCH-SQUARE.

BRISTOL:

ASHTON GATE WORKS, CORONATION-B



## ILLUSTRATIONS.

New Chapel, Giggleswick School.—Mr. T. G. Jackson, R.A., architect .....	Double-Page Photo-Litho.
Facade of a Town House.—Mr. M. S. Hack, A.R.I.B.A., architect .....	Single-Page Ink-Photo.
Premises, Friar Lane, Leicester.—Mr. M. S. Hack, A.R.I.B.A., architect .....	Single-Page Ink-Photo.
Part of House, "Cliff Towers,"—Mr. C. Harrison Townsend, F.R.I.B.A., architect .....	Single-Page Ink-Photo.
New Altar, St. Mary's, Chaddesden, Derby.—Mr. Henry Rose, architect .....	Single-Page Ink-Photo.
New Chancel, &c., St. Bartholomew's Church, Southsea.—Messrs. W. A. Coombs & E. Towry Whyte, architects .....	Single-Page Ink-Photo.
* Prix de Rome "Prize Designs, Ecole des Beaux-Arts, Paris:—	
First Prize in Architecture: "A Palace for Entertaining the Illustrious Guests of France."—M. Léon Chiffot .....	Double-Page Ink-Photo.
First Prize in Painting: "The Pool of Bethesda."—M. Gibert .....	
Second Prize in Sculpture: "Cain After the Death of Abel."—M. Boucher .....	

## Blocks in Text.

"Sultana's House," Fathpur Sikri: Plans and Brackets carrying	
Lintels of Verandah Roof.—From "Portfolio of Indian	
Architectural Drawings" .....	Page 222
Detail of one of the Brackets in "Sultana's House," Fathpur	
Sikri.—From "Portfolio of Indian Architectural Drawings" .....	" 493
Sketch Elevation of New Theatre, Kiew.—Professor Victor	
Schroeter, Architect .....	" 223

Sketch Plan of New Theatre, Kiew .....	Page 229
Chapel, Giggleswick School. Plan .....	" 230
A Town House. Plan .....	" 231
St. Mary's, Chaddesden. Plan .....	" 231
St. Bartholomew's Church, Southsea. Plan .....	" 232
Illustrations to "Students Column" .....	" 234

## CONTENTS.

"The Mogul Architecture of Fathpur Sikri" .....	221	Magazines and Reviews .....	231	Appointment of Architect, Salford Workhouse .....	234
The Collection and Disposal of Refuse .....	224	Competitions .....	232	The Students' Column: Sound, Light, and Heat.—XI. ....	234
Notes .....	225	Books: J. Robert Robinson's "The Princely Chandeliers" .....	232	Obituary .....	235
The New Municipal Theatre at Kiew .....	226	Richard Henderson's "The Young Estate Manager's		General Building News .....	235
Notes on the Design and Erection of Architectural Ironwork .....	228	Guide: "Journal of the Sanitary Institute," A. W. F. Lough-		Sanitary and Engineering News .....	235
Unclaimed Drawings .....	230	ham and A. Whillier's "Arnold's Scale Drawing Sheets,"		Stained Glass and Decoration .....	235
New Chapel, Giggleswick School .....	230	Richard Kerr's "Wireless Telegraphy Popularly Ex-		Foreign .....	235
Facade of a Town House .....	230	plained," W. Perren Maycock's "Electric Wiring and		Miscellaneous .....	237
Cliff Towers .....	230	Fitting Details Book" .....	232	Capital and Labour .....	237
New Altar, St. Mary's, Chaddesden, Derby .....	230	Trade Catalogues .....	233	Legal .....	237
St. Bartholomew's Church, Southsea .....	231	Thomas Drew, Architect, 1756 B. ....	234	Recent Patents .....	238
* Prix de Rome "Prize Drawings" .....	231	James II.'s Statue, Whitehall .....	234	Some Recent Sales of Property .....	239

### The Mogul Architecture of Fathpur Sikri.



VERY Englishman who feels a patriotic interest in the great deeds of his own countrymen in past days ought to wish to visit India: the conquest and the regeneration and the government of which by the English race is

perhaps the chapter in our history, in the modern era, of which we may think with most pride. And if the Englishman happen also to be an English architect he has a double reason for feeling interest in and a desire to visit the country, not so much on account of the architectural remains of the indigenous race—for we consider the various types of Hindu architecture, regarded in a purely artistic light, not by any means worth the enthusiasm which Fergusson felt and expressed for them—as on account of the rare combination of refinement with richness of detail which was realised by the Saracenic mind working on the suggestions of Hindu architecture. That is where the real greatness of the architecture of the Indian peninsula is to be found. The weak point of pure Saracenic architecture, with all its beauty, is its want of monumental solidity of character. The Mahomedan conquerors in India found in the Hindu monuments the element of mass and solidity of appearance and structure, defaced more or less by barbaric detail and disproportion of parts, and characterised by ornament in which a good deal of beauty, derived mainly from floral forms, was intermixed with grotesque figures of human or semi-human character, with hideous idol travesties of human form and monstrous animals. They adopted, in their buildings in the conquered portions of the country, the solid character of the Hindu architecture, but refined its forms and proportions. Their religion fortunately put them, out of the reach of the temptation to adopt travesties

of human or animal forms as ornament, and they introduced into their buildings a whole system of exquisite ornamental detail based on geometrical forms and on conventional foliage, and combining some of the best qualities of Hindu detail with that which was more essentially Saracenic in character. They thus produced an architecture, or at least a great many works of architecture, in which the greatest richness of detail is combined with the greatest refinement of taste, with a success which is hardly perhaps to be found anywhere else in the world.

Unfortunately comparatively few of those whose professional career does not call them to India have the means and the leisure to make a personal inspection of these beautiful works in a distant part of the Empire. But the Government of India, by means of the work of their Archaeological Survey, have done and are still doing a great deal towards providing those at home with adequate illustrations of Indian architecture. It is true that in the productions of the Archaeological Survey there is to be felt the want of the truly architectural or artistic mind, and we are inclined to think that the information contained in the literary portion of these official publications must be taken with reserve. But we are indebted to the Survey for a very valuable collection of illustrative drawings. The last addition to these is the portfolio of drawings from the buildings at Fathpur Sikri, made under the direction of Mr. Edmund W. Smith, and which are on a larger scale and executed with higher finish than those attached to the ordinary official volumes of the Survey.

The English writing of Indian names has undergone a bewildering variety of changes, and readers may not immediately recognise that Fathpur Sikri is the now orthodox and officially recognised spelling of the place we have formerly known as Futtehpore Sikri.\* Fathpur Sikri, situated a little over twenty

miles nearly due west of Agra, has been called a kind of Pompeii of Mogul architecture, but with the fortunate difference that the principal buildings are in much more complete condition, architecturally, than those at Pompeii. A plan of the place is given in Vol. XVIII. of the Archaeological Survey, showing an irregular collection of buildings which are all regular and symmetrical in themselves, but disposed at various angles to one another. The whole place owes its origin to Akbar, during the latter half of the sixteenth century. According to the general description given in the preface to the eighteenth volume of the Archaeological Survey, the entire city is about seven miles in circumference. "Down the centre of the city, from south-west to north-east, runs a red sandstone ridge, and all the monumental structures with which this Report deals are built upon it. The palaces must have been deserted soon after Akbar's demise, for Finch visited the town in the early part of Jehangir's time" (the son of Akbar) "and 'found it ruinous, lying like a waste district and very dangerous to pass through at night.' The selection of the site for the town seems to have been made, in all probability, from some motive of religion or superstition connected with it, and the position of the principal group of buildings may have been determined on the practical ground of the existence of the sandstone ridge, which furnished the stone for the buildings, easily carved into all the multiplicity of ornament aimed at, but for the same reason rather liable to the decay which has destroyed or injured some portions of the surface work.

The most remarkable buildings are a great mosque with an immense cloistered courtyard and a magnificent gateway (a later addition) on the southern side, which forms one of the most effective illustrations in Fergusson's book on Indian and Eastern architecture; a palace which may rather be called a collection of small palaces, the three most beautiful of which were erected for three of the wives of Akbar, and the Panch Mahal, a very characteristic erection in a somewhat different style to the most prominent of the other buildings, and somewhat resembling a Buddhist Vihara

\* There has been recently, we believe, a serious attempt to settle the spelling of Indian names on a recognised logical and philological principle, and therefore there will perhaps be an end now to the perpetual changes which perplex the readers of books on India.



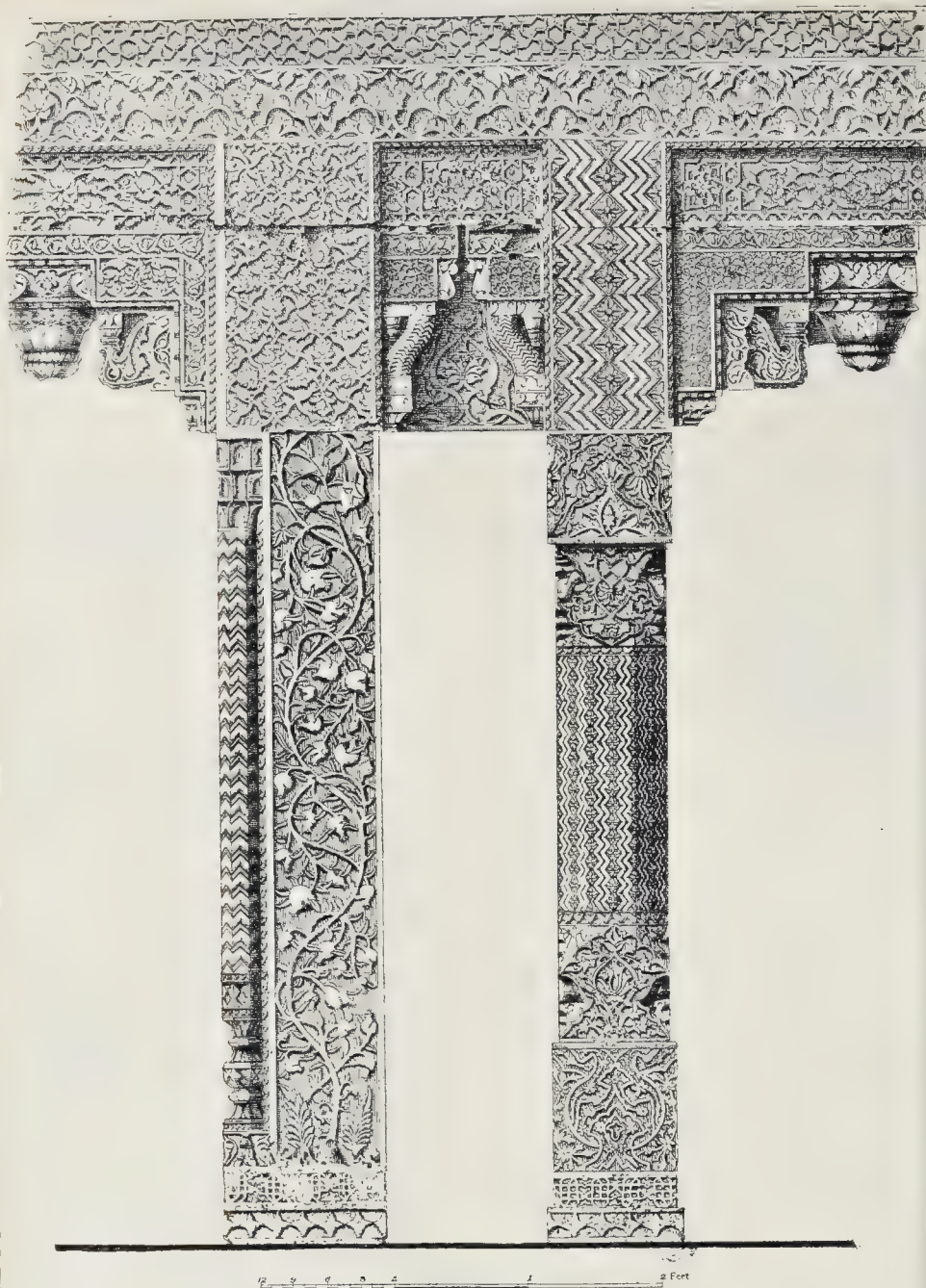


Fig. 1.—"Sultana's House," Fatehpur Sikri: 1 Piers and Brackets carrying Lintels of Verandah Roof.—From "Portfolio of Indian Architectural Drawings."

in general idea, consisting as it does of successive stories each carried by a colonnade, but each smaller in area than the one below it, so that the whole has a pyramidal form, and finishes in a small pavilion with a pillar at each angle. The columns are spaced in

squares all over the floors, at a distance averaging about 9 ft. from centre to centre, the columns of each floor over some of those of the floor below; the whole making a series of covered promenades open at the sides. The mosque, which in the Archaeo-

logical Survey is called "The Great Masjid," is distinguished in the portfolio of drawing as the Jami' Masjid, the same word as "Jumma Masjid," a name which has been more generally connected by architectural readers with the great mosque at Jaunpur



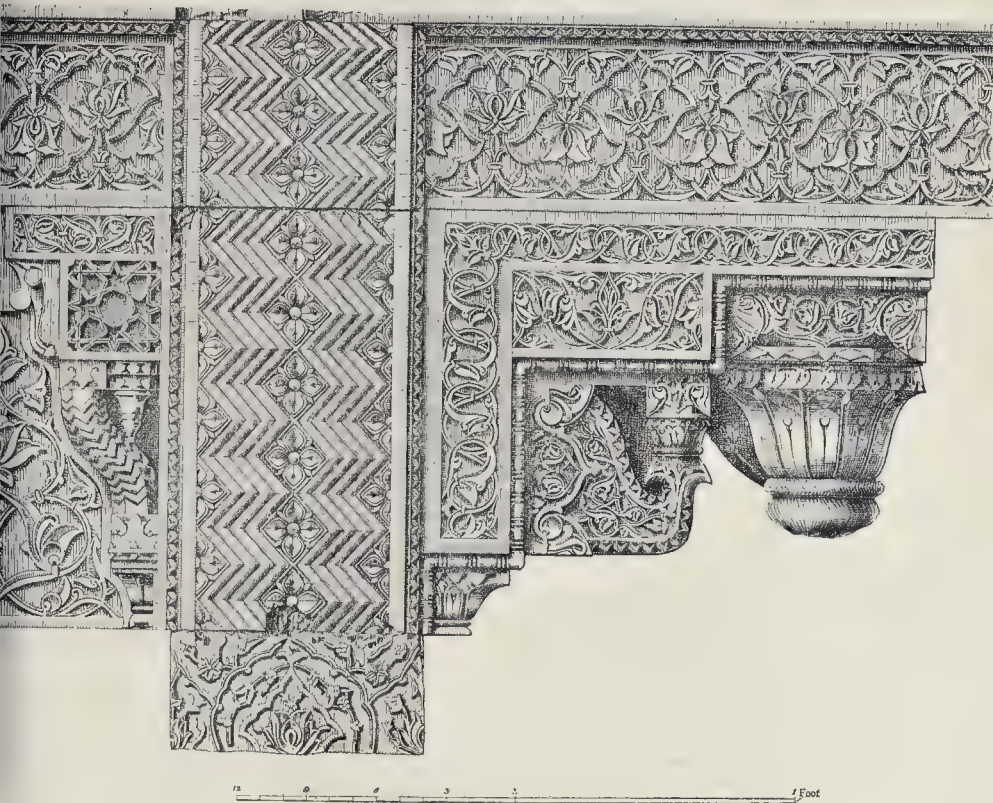


Fig. 2.—Detail of one of the Brackets in "Sultana's House," Fatehpur Sikri.—From "Portfolio of Indian Architectural Drawings."

which means merely the "Friday Mosque," and is applied to several buildings of the same class in India.

Judging from the disposition of the buildings, Fergusson was probably right in thinking that the one known as the "Khas Mahal," partly surrounding a courtyard with a tank in it, was the initial building of the place, though it was not that on which the latest elaboration was bestowed. This was reserved, in the palace, for the three houses supposed to have been erected for Akbar's three favourite wives, the most beautiful of which, called the Turkish Sultana's house, an addition to the north-east angle of the Khas Mahal. This is a small building, nor does the photograph of it in the Survey, where it appears reflected in the calm water of a tank, seem to justify Fergusson's praise, for "it is impossible to conceive anything so picturesque in outline, or any building so well adapted and ornamented to such an extent, about the smallest approach to being verdant or in bad taste." As a whole it is very picturesque in outline; and the lean-roofs, projecting a considerable way beyond the line of the porticoes, have a somewhat clumsy effect, and moreover do not seem architecturally in character with the supports, the design of which, when alone, rather suggests that they are designed more in keeping with a flat-roofed building; certainly, in the view, they seem overweighed by the overhanging roofs. On the other hand, nothing in its way could be more beautiful than the work on the pillars

and brackets, of which we give two illustrations, reduced from the large plates in the Portfolio. The ornament is varied continually; the bracket of which the detail is given in fig. 2, it will be observed, is different in its ornament from that shown in conjunction with the two pillars in fig. 1, though similar in general design. The inner faces of the sloping roofs are very richly treated in carved square panels, and have a rich effect in themselves, as seen in the photograph of the interior in the "Survey;" but here again we feel that the sloping line sits awkwardly on the walls and supports, and the enrichment itself of the ceiling seems more in keeping with a flat ceiling than with a raking one. The brackets, of course, are not very constructional in form; but no more are the pendants of a Tudor vault, if it comes to that. The lean-to roofs, it may be added, are described as cut out of solid blocks of stone; one can understand that the width (about 8 ft.) might be spanned by one length of stone, but one can hardly suppose that the whole portion of the roof shown on Plate V. is in one block of stone, and no jointing lines are indicated. The panels, about 7 in. square, are filled with small and elaborate ornament, mostly delicate geometrical tracery in bars about  $\frac{1}{2}$  in. thick. All these details are carefully given to scale.

Among the drawings from the Jami' Masjid the finest is that of the principal Mihrab, with a rich mixture of ornament of Saracenic and Hindu types, the inlaid band of ornament

round the inner niche being completely Saracenic in design—it might have come from the Alhambra, while the projecting bud-forms which make a delicate fringe round the inner archivolt of the larger arch are as distinctly Hindu in character. The principal dome of the mosque, it may be remembered, is carried on large corbels, each projecting course of which is defined by a double band of carved ornament, one on the upright face, the other on the *gyrna* moulding above—seen in the detail drawing, apart from the main design, this is a rich and striking piece of decorative masonry; but it cannot be denied that it looks rather clumsy and heavy in its place under the dome, and compares very unfavourably with the pendentive form of support.

Inside the quadrangle of the Mosque Salim Chisti's tomb, a square domed erection, is a fine and interesting work, decorated internally with colour; to the illustration of the coloured decorations two fine plates are devoted, but we have no information as to the present state of the coloured work, or how much of these plates is restoration.

The detail of the small entrance in the eastern screen in this tomb is drawn with great care to a pretty large scale on Plate XLIV., and is almost purely Arabic in style. This tomb is dated at 1581; we are not given the authorities for the dates; but, accepting them as correct, the fact of this more decidedly Arabic style in a work later in date than the Mosque and the Sultana's house (which is dated as 1565),



seems to throw some light on the style of the Panch Mahal, which differs materially in style and manner from the buildings the illustrations of which have already been referred to. No drawings of this structure are given in the "Portfolio," but there are two or three photographs of it in the "Survey," and from these it is evident that it is much more Indian in style than some of the other buildings; the design of the columns is rather Hindu than Saracenic, and the general form, as already observed, rather resembles that of a Buddhist Vihara. In the Sultana Palace the details are much more Saracenic, though the form of the brackets retains a distinct impression of Hindu taste, and that of the columns to some extent, though not so much; while in Salim Chisti's tomb we come on work of an almost purely Saracenic character. The conclusion would seem to be that the Saracenic taste and influence became more marked as the buildings went on, the older ones retaining more of the native impress.

The drawings which form the Portfolio were prepared, under the compiler's direction and supervision, by native draughtsmen, who had received preliminary training in the Indian Schools of Art before entering the Archaeological Department. They do great credit to the skill and care of the draughtsmen, but of course to some extent they must be restorations of the work, which cannot be supposed to exist in anything like this complete condition. Some photographs of detail, giving the precise impression of the work as it now stands, would have been a useful and desirable addition, and we may suggest that this should be taken in consideration in preparing the next Portfolio of the series, for it is understood that others are to follow if this one seems to meet with success and approval. However, as it is, we are very glad to have it, and may congratulate Mr. Smith and the Archaeological Survey on the results of his labours.

#### THE COLLECTION AND DISPOSAL OF REFUSE.

**I**N the "good old times," to which the pessimists of to-day are so fond of directing our attention, the disposal of refuse was so vilely done, or, rather, left undone, that plague and pestilence were the common scourges of the "civilised" world. Household holders had no concern for the cleanliness of the streets, but threw their garbage out of windows and doors, heedless of stench and ignorant of the fearful results of such insanitary practices. When Dr. Johnson visited Edinburgh and, one dusky night, "walked arm-in-arm up the High-street" with his devoted friend Boswell, the latter, for all his wishing, "could not prevent his being assailed by the evening effluvia of Edinburgh. . . . As we marched slowly along," says Boswell, "he grumbled in my ear, 'I smell you in the dark!'" On another occasion Johnson referred, in the plainest of plain English, to some of the utensils which were emptied on the heads of benighted pedestrians in the Scottish capital; and Boswell tells of a distinguished baronet who was wont to observe that "walking the streets of Edinburgh at night was pretty perilous and a good deal odoriferous." What the state of affairs was before Boswell wrote decency forbids us to inquire, for the

utmost that even he could say in favour of the sanitary condition of the city in his time was that "the peril is much abated by the care which the magistrates have taken to enforce the city laws against throwing foul water from the windows; but, from the structure of the houses in the old town, which consist of many stories, in each of which a different family lives, and there being no covered sewers, the odour still continues."

Edinburgh was no worse than many other towns, although we of to-day can scarcely credit the fact. It is almost impossible to believe that it is little more than a century since Boswell's words were written, and that the practises and methods he describes continued with little change for many years afterwards. Improvement in cleanliness is one of the truest tests of advancing civilisation, and it will be one of the glories of the nineteenth century that it has done so much towards making foul places clean, towards improving the construction and sanitation of dwellings and streets, and towards the quick removal and satisfactory disposal of noxious refuse of all kinds.

Much yet remains to be done before the sanitary ideal is reached; every town has still its slums, and many have unpaved streets reeking with filth, open middens filled with decaying garbage and worse, overflowing privies and cesspools, and defective drainage and sewerage. Many country-places are still the dumping grounds for the foul refuse of towns, and many of our rivers are still the common sewers of the districts through which they flow. Even New York, amid its grandiose avenues, had, up to 1895, streets littered with refuse of all descriptions. When Colonel Waring, in that year, became head of the Street-cleaning Department of the city, he found a chaos of dirt which is almost incredible. East Fourth-street, he wrote at the time, "has the appearance of being the dumping-ground of the whole ward"; Pitt-street was covered with "mud, ashes, filth, and garbage. . . . to the depth of about 8 in.;" on Ludlow-street, "trucks, wagons, and carts were standing in filth of every kind from 1 ft. to 2 ft. deep"; "on the west side of Thompson-street . . . were piles of snow, ice, mud, garbage, and general filth from 3 ft. to 4 ft. high, on which trucks and wagons were piled; opposite nearly every door there were overflowing barrels of refuse." One more example of the prevailing state of what we may charitably suppose to be the back streets of the city, will suffice to show the insanitary conditions resulting from Tammany control: "There was a pile of garbage in front of Van Holten & Bay's store at 500, Ninth Avenue; a clerk in the store said that people had to dump the garbage in the gutters because the carts of the Street-cleaning Department did not take it away; he could not remember the last time the block was cleaned." Instances like these are a strange commentary on the vaunted progress of the United States, but it is a pleasure to be able to record that, thanks to Colonel Waring's energetic and methodical work during the last three years, the filth has been cleared away and the streets paved, and that refuse is now removed at frequent intervals.

When we think of the insanitary conditions so recently prevailing in the chief city of the new world, and even now prevailing in so many towns and cities of

Europe, we in England may take credit to ourselves for the progress we have made in the practice of sanitary science. Pioneers in the science, we still hold our lead; experts from all lands come to learn our methods and to buy or copy our sanitary appliances. Every year we learn something new, and spread it abroad by lecture, pamphlet, and book. To-day we have before us a new work of nearly 400 pages on "The Removal and Disposal of Town Refuse,"\* which cannot fail to assist in the progress of cleanliness and in the reduction of disease and death. It is largely a compilation from the writings of engineers and doctors, and from reports to sanitary authorities, but it is a compilation, on the whole, well done, and its author, Mr. W. F. Maxwell, deserves credit for his labour and his skill, as well as for his honesty in mentioning the sources from which he has borrowed. The scope of the book is wide. It includes the legal powers and obligations of sanitary authorities and householders; the scavenging and cleansing of streets; the collection of house-refuse, with incidental remarks on trade refuse; the removal of excrement; the disposal of refuse of all kinds by sorting, tipping, barging, and cremation; Refuse-destroyers and their accessories; a carefully described, and their use as generators of steam-power is considered with some degree of thoroughness. Chapters are included on tall-chimney construction, water tube boilers, and thermal storage. Nearly one half the book is occupied by descriptions of the methods of refuse disposal in use in upwards of a hundred towns and cities in this country and abroad. The book is well printed, and seventy-three illustrations and a good index enhance its value.

From this brief outline of the contents, it will be seen that the book merits the consideration of all engaged in sanitary work. It is, indeed, one of the most comprehensive books on the subject which has yet been written. It is, therefore, the greater pity that it is marred by many slight errors, which certainly ought not to have found a place in a book of this importance. Perhaps the most common error is the use of a singular verb after a plural noun; thus (to give a few examples) on page 3 we have "works connected with the removal of refuse . . . now becoming," &c.; on page 20 the information is given that "the surfaces of pavements and roadways is also kept cleared of 'slop' by the 'orderly service boys' using 'squeegees'"; on page 53 we are told of "an air-tight cesspit tank into which the excreta is drawn, and the exhausting the air from it at intervals"; a plural verb after a singular noun occurs on page 64, where it is said that "the nature of the surroundings afford every facility for the disposal of the pail contents." The derivation of the word "scavenger" is scarcely up to date; it is now generally considered to have come from the Anglo-Saxon "sceawian," through the late Latin "scavium," the Anglo-Saxon word meaning simply "to show." "Next" is not usually employed in the sense of "preceding," as on p. 161. Inelegant and inexact expressions occur, the use of the relative pronouns being most at fault; thus we find on p. 5, "Terms 'house,' 'trade,' and 'street refuse'"

\* "The Removal and Disposal of Town Refuse," William F. Maxwell, Assistant Engineer and Surveyor, Leyton Urban District Council. London: The Sanitary Publishing Company, Limited. 1898. Pp. x., and 377. Seventy-three illustrations.



are, however, clearly defined in the Public Health (London) Act, 1891, and which interpretation will presently be given;" and on p. 16 Mr. Maxwell discusses asphalt as a paving material in these words: "When kept well cleansed it is not slippery, but it is liable to become so under certain conditions of weather, and for which reason should not be laid upon a gradient steeper than 1 in 60." We have always been under the impression that scavengers were appointed for the removal of refuse, but on p. 45 we learn that "refuse is . . . for the removal of the scavengers!"

In the table on p. 16 there is a printer's error which so entirely destroys the sense of one portion of it, that we could not discover the meaning till we refreshed our memory by looking at the version of the table given in Mr. Boulnois's "Municipal and Sanitary Engineers' Handbook"; in Mr. Maxwell's book, the column in question is headed, "Loads of Mud per Area. Superficial Yards," and whether the figures below are so many loads of mud or so many superficial yards, it is impossible to say. Mr. Boulnois has it, "Load of Mud per Area. Superficial Yards," and the meaning is obvious, the figures below being so many superficial yards, and the load of mud being obtained from each area, i.e., from 344 superficial yards of macadam, 500 yards of granite sets, 1,666 yards of wood, and 4,000 yards of asphalt.

Mr. Maxwell's attempts at wit and fine writing are, we regret to say, deplorable; the long paragraph on p. 28 should be struck out altogether, and the passage on p. 41 about "the celebrated Mr. Hercules" would be all the better without the attempted smartness. At the same time, a few redundant prepositions may as well be omitted, as in the phrase on p. 166, "filling the interstices in the flags"; there is no necessity whatever for the former of the two prepositions. Ordinary tip-carts, we are told on p. 49, "are heavy, somewhat clumsy, and are usually mounted by the scavenger, plus bladder"; if this means anything, it means that the ladder, as well as the scavenger, spends its time in mounting the cart! We have drawn attention to these errors, which after all do not in any way lessen the actual utility of the book, for Mr. Maxwell's merit, so that when a second edition is called for (as probably it will be), he will be able the more easily to remove some of the little blemishes which mar an otherwise good book, and which undoubtedly irritate the educated reader.

The matter of the book is undoubtedly better than the manner, and Mr. Maxwell may be congratulated on having produced a work containing a great amount of useful information. The different kinds of refuse are first considered from the legal point of view, after which "the scavenging and cleansing of streets" receive attention. Major Isaacs is noted respecting "the essential points for good pavement," "from a hygienic point of view." The first "point" is that "it must effectually prevent the rising of exhalations from the ground on which it is superimposed," undoubtedly this is a good point "if the ground-air can escape elsewhere than into the adjacent buildings. Air-tight paving in crowded localities inevitably compels the ground-air, during periods of rising ground-water, to pass into the neighbouring basements; numerous explosions have been caused in this way, the ground air polluted with coal gas

from leaking mains having been forced into the buildings, as no other outlet for it was provided. The planting of trees in streets has more than an æsthetic value; the unpaved ground at the root of each tree is a sort of safety-valve, whence the ground-air may escape. This is a point affecting architects, and engineers ought not to be allowed to ignore it.

The cleansing of streets receives careful attention from Mr. Maxwell, but it is somewhat surprising that the regular practice of the "City" of London is not alluded to; any one who passes through the streets of this portion of the metropolis in the small hours of the morning cannot fail to be struck with the odour of carbolic acid, and a little examination will show that the water used for washing the streets contains some quantity of the disinfectant. Mr. Maxwell's proposal to remove the orderly bins, and to substitute for them "suitably-made hand trucks," would, we fear, receive scant consideration from the City Fathers. The progress of a "hand truck," receiving contributions of horse-droppings by the way, would be *anathema* to the drivers of vehicles of all kinds in crowded streets like Fleet-street and Cheapside. The pair of light bicycle wheels, with a frame for a movable bag, as used in New York, would be better than a hand truck, as in the former case each sweeper has his own little vehicle, and can, therefore, move about rapidly, whereas the progress of a hand truck receiving the contributions of a whole gang of "orderly" boys would necessarily be slow.

In treating of the collection and disposal of house refuse, the composition and quantity of the refuse are first considered, the quantity in London being between 4 cwt. and 5 cwt. per head per annum, but the amount varies very much in different towns. With reference to the temporary storage of the refuse in or near houses, Mr. Maxwell adopts the current orthodox view in favour of "small accumulations" and "frequent." The portable galvanised-iron dust-bin is considered by him to be preferable to all fixed structures, but we certainly think he might have made an exception in favour of Dr. Quine's "sanitary ashbin" for towns where back streets are the rule. Something also might have been said of the preliminary sorting of refuse by householders, which is now in operation in New York. The ultimate disposal of the refuse is a matter of great difficulty—especially where some system of utilisation is attempted—if all kinds of refuse, from street sweepings and garbage to paper and rags, are collected in the same cart or van. To lessen the difficulty of disposal, Colonel Waring has inaugurated a system of preliminary sorting, which has much to recommend it. Household garbage and ashes are now placed by the householder in one receptacle, and paper, rags, tins, bottles, old boots, carpets, boxes, and wood and metal articles of all kinds, in another receptacle. The garbage and ashes are collected at the same time as the street sweepings and barged out to sea; the other refuse is sorted, and a profit realised on the sales. Another feature of interest in the New York method of collection is the general use of bags, not only for street sweepings, but also for garbage and ashes; by this means the objectionable features of conveying refuse in open carts are avoided.

In reference to the important subject of the removal of excreta, the author favours the water-carriage system in the case of towns, but rightly allows that "the dry-earth closet with a small movable pail and the necessary facilities and appliances for the application of dry earth or ashes" is permissible in rural districts. The disposal of refuse by "utilisation" is then considered, the processes of sorting and sifting in use in this country being described, including the mechanical method of sorting adopted by The Refuse Disposal Company. Additional interest would have been given to the chapter if some of the American systems or utilisation had been mentioned, several of which extract the grease from the refuse.

Rather more than one-fourth of the book is devoted to the subject of Refuse Destructors, a subject on which we have only recently published (August 27) a tolerably exhaustive paper read at the Dublin Hygienic Congress; but descriptions of a great many forms of Destructor will be found in Mr. Maxwell's book, which includes also chapters devoted to tall-chimney construction and water-tube boilers.

The book contains a great deal of valuable information, arranged in an orderly manner, and notwithstanding the small blemishes which somewhat detract from its merit, it will be of service in promoting a knowledge of the difficulties which beset the subject of refuse collection and disposal. The pity is that householders do not take more interest in the matter; if they did, they would aid the engineer by destroying what refuse it lay in their power to destroy, instead of rendering his labours more difficult by sending every waste material, no matter how putrescible, to the dustbin. It is an easy matter for the ordinary householder to reduce the refuse of his house to a very small compass indeed, and it may be useful in this connexion to draw attention to a very useful apparatus which has been recently devised by Mr. Petter of Yeovil. It is simply a closed chamber under the fire-grate of an ordinary kitchen range, and so arranged that the fumes from garbage placed in it for destruction are drawn through the fire above, the products of combustion passing up the chimney. In many places such an apparatus would be a great boon, and would undoubtedly tend to reduce the labours of the Sanitary Authority.

#### NOTES.

The British Association Address.

Or the two types of British Association Presidential address—the summarising type and

the specialist type, the latter has been the more prominent in recent times. Presidents who have made a special record in any branch of science have considered the chair a standpoint from which to review the progress of their own particular branch of scientific research. Sir W. Crookes has reverted to the "summary" type of address, which may in this case be said to deal with all things in Heaven and earth, commencing with "Food Supply" and ending with "Psychic Research"; so that at all events all tastes ought to have been suited. Perhaps the most practically interesting portion of the address is that in which we are promised "salvation by chemistry," or that starvation may be averted through the laboratory. "Before we are in the grip of actual dearth the chemist will step in and postpone



the day of famine to so distant a period that we, and our sons and grandsons, may legitimately live without undue solicitude for the future." For our own part, we have long waited for a new word from science in promise of the production of artificial warmth, when required, by other means than that of compelling various substances to part with their stored-up heat by combustion. We should not be surprised if chemistry were ultimately to prove the best means of enabling us to reach the North Pole, by providing men with both nutrition and heat in ways not hitherto attempted. Perhaps the next British Association President may have something to say on this point.

Dr. John  
Hopkinson.

ELECTRICAL engineering has suffered a grievous blow by the untimely death of Dr. John Hopkinson. Although his life has been cut short at the comparative early age of fifty years, yet he has left behind him a record of successful work which entitles him to a foremost place both amongst the engineers and the physicists of the century. His early reputation was made by improvements in methods of illumination for light-house work. He invented the system of group flashing lights, which has been universally adopted, and he was engineer of the well-known electric lights at Tino, in the Greek Archipelago, and of the Macquarie lights at Sydney. As a practical engineer he was best known by the many ingenious apparatus he invented in connexion with lighting and traction work, and the design of several central stations, of which the very successful one at Manchester is the most important. His most valuable patent was the three-wire system of distribution, a method which is now in use at almost every electric lighting station in the world. Although his time was greatly taken up by professional work, yet he found leisure to communicate many papers containing both experimental and theoretical investigations to the Royal Society, who awarded him a medal in 1890. He was twice president of the Institution of Electrical Engineers, and during his second presidency in 1897, by his tact and firmness, he successfully guided it through a very stormy period of its existence. He also founded the Volunteer corps of electrical engineers, and was appointed its Major by the War Office. On reviewing his work, we are inclined to think that the method he devised of predetermining the characteristic curve of a dynamo was the part of his work that has contributed most to the unparalleled progress of the electric industry. The method, which is described in a paper contributed in conjunction with his brother, Dr. Edward Hopkinson, to the Royal Society in 1886, marks an epoch in electrical theory. It raised dynamo designing from being mere guesswork into an exact science. Dr. Hopkinson, at the time of his death, was acting as consulting engineer to many large electrical undertakings which can ill afford to lose him. There was no engineer whose opinion carried greater weight with electricians, and, with the exception of Lord Kelvin, there was no one whom they more delighted to honour.

The Well-  
borough  
Accident.

ALTHOUGH, of course, the lamentable sacrifice of life and the terrible suffering involved in this catastrophe claim our first and

deepest sympathy, it is impossible to reflect upon the sudden destruction of the magnificent Midland express itself without a feeling of sadness. The engine and coaches alike attracted the attention of all who saw the train standing at St. Pancras, or gliding into the stations at which it stopped on its way to Manchester. It was one of the most elaborate and substantially-built trains run on this or any other line, every modern improvement being adopted, and the comfort and safety of the passengers considered in every way. The old question of the desirability of introducing the American "cow-catcher," or some similar appliance, is again revived by this disaster. There are those who advocate a device which would "toss the obstruction on one side"; but it is well to consider what the effect would have been had such an apparatus been in use on this occasion. The trolley would simply have been flung against the side of the platform, rebounding or wedging between the train and the brickwork; and it appears to us that derailment would still have been almost certain to ensue. Although it now appears very uncertain as to the culpability of the boys who were at first supposed to have started the runaway truck, the lesson of the disaster clearly is that no unauthorised person should be permitted to interfere with barrows, &c., except under the direction of officials. It is not at all improbable that such interference is against the rules as it is, for in railway accidents we have become accustomed to find that the cause has been carefully provided against by the company's regulations, but that the particular rule affecting the case has become partially or wholly a dead letter. In this instance, no fault whatever attaches to the unfortunate driver, or any one connected with the working of the train, but the Midland officials cannot afford to neglect the lesson indicated.

Typhoid Fever  
at Maidstone.

THE three Local Government Board Inspectors appointed to inquire into the recent terrible outbreak of typhoid fever at Maidstone have now issued their report. In their opinion, the epidemic was undoubtedly caused by the pollution of the Farleigh branch of the water supply, but at the same time they condemn the Town Council for having made no attempt to remedy the insanitary conditions prevailing throughout the town. There can scarcely be two opinions as to the dangers of leaky sewers and drains, and of crowded cesspools, but the attempt made at the time of the epidemic to throw all the blame on the sanitary defects of drains, sewers, and cesspools, was, as we pointed out in our issue of March 18, 1898, based on a partial view of the case. Typhoid fever may, it is well known, be air-borne, but at Maidstone the facts of the simultaneous outbreak of the disease over a wide area, and of the rapidity of its spread in that district which was supplied with water from the Farleigh sources, certainly points to this epidemic being another example of water-borne disease.

A Clergyman  
on Sewage  
Disposal.

A WEEK ago the *Times* contained a letter from a high dignitary of the Church of England, which, for naïve ignorance, would indeed be difficult to parallel even in the columns of the daily Press. The Rev. J. W. Sheringham is the writer of the letter, and is

also "Archdeacon and Canon of Gloucester." He is under the impression that the only "palliatives on which we place our reliance" for purifying sewage are those "miserable subterfuges indeed—sewage farms," and that his plea for "the cremation of sewage" or rather, as he afterwards explains, the "solid matter" in sewage—is an entirely novel suggestion! "I plead," he says, "for the erection of huge furnaces at the outfalls of our drains; no doubt they would require lofty chimneys and chemical ingredients to neutralise the noisome gases, but this, surely cannot be beyond the reach of science. In these furnaces the solid matter would be burnt and form artificial manure; the liquids being properly filtered and deodorised, might then be allowed to flow away." Perhaps Archdeacon Sheringham will explain what the manurial value of sewage sludge, after it has been burnt in a "huge furnace"? At places such as Ealing and Leyton, where the Archdeacon's suggested processes are in actual operation (but, of course, without the "chemical ingredients to neutralise the noisome gases"), the officials would be only too glad to find farmers willing to purchase the "clinker," which is all that remains from the burnt refuse. With the Archdeacon's intentions, however, we are in entire sympathy; his remarks on the hideous pollution of our streams are not a jot too strong. The gradual awakening of all sections of the public to the necessity for more stringent regulations as to the pollution of streams is indeed a sight to make the heart of the true sanitarian rejoice; and we trust that Archdeacon Sheringham will continue to take a keen interest in the purification of the river of our country; but his influence will be the greater if he will first undertake a short course of reading on the subject.

Vauxhall  
Bridge.

THE materials of old Vauxhall Bridge are offered for sale. It is the first iron bridge across the Thames in London that was opened for traffic (June 4, 1816); the first stone of the pier begun by Rennie was laid by Lord Dundas, as the Prince Regent's proxy, on May 9, 1811. By reason of certain disagreements, four engineers were concerned in its design and construction. The original designs by Ralph Dodd for a stone bridge of nine arches, with a 78 ft. span, were approved in 1809. Rennie succeeded Dodd and was in turn superseded by Sir Samuel Bentham. Finally, James Walker was appointed by a public company to complete the work, which was resumed in 1813, the stone being laid on August 2 by the Duke of Brunswick, the same who fell at Quatre Bras. For economy's sake Walker adopted iron arches, but carried up the stone piers whose foundations had already been laid. The eight piers are 13 ft. wide, the middle arch rises to 27 ft. above high water: the bridge is only 36 ft. wide. It was intended that it should be called Regency Bridge, but local associations prevailed and it soon took the name of the adjoining Gardens, which were not finally closed until forty years ago. The total cost amounted to 300,000*l.*, with 70,000*l.* more for legal expenses. The late Metropolitan Board of Works bought the bridge for 255,230*l.*, and opened it toll-free on May 2, 1879. The old Vauxhall turnpike stood about 90 yards from the bridge's east end. Some observations upon the design, with



illustrations of one of the piers, &c., and the cast-iron balustrade railing, will be found in a paper on "London Bridges: Architecturally Considered," read at the Architectural Association by the editor of this journal, and printed in our issue of February 23, 1895.

**Highgate Archway.** THE rebuilding of the Archway, after the designs of Sir Alexander Binnie, Engineer of the London County Council, is making progress. Mr. C. Wall's tender for 25,126*l.* was accepted, and the work will be completed in eighteen months hence. The bridge, of steel and cast iron, will have Portland stone, concrete, and brick abutments, and it is stated that certain parts of the former fabric are to be incorporated in the new structure. The span will be 120 ft., the width between the parapets is 40 ft., whereof 16 ft. are allotted to the two footpaths. The old Archway, built of brick and stone, rose to 65 ft. from the roadway to the vault of its upper arch; that height was divided into two stories, as it were, the lower being 36 ft. high, by 18 ft. wide, and having, it is said, the main and three minor arches turned underground just as they were turned above. It was made to carry Hornsey-lane across the cutting of the Archway-road. In order to relieve the steep ascent of the Great North-road up Highgate Hill a scheme was propounded in 1899, by Robert Vazie, to divert the traffic making a tunnel 24 ft. by 18 ft. high and about 1,080 ft. long through the hill of ferruginous clay. The Highgate Archway Company obtained an Act in the following year, and adopted Rennie's proposal for a tunnel 15 ft. in length (to be reduced to 633 ft. if funds allowed) joining two open cuttings 135 ft. and 174 ft. respectively. But in April, 1812, the works fell in, after 390 ft. of tunnelling had been bored, so it was decided to make an open cutting throughout. The works, including the approaches, cost nearly 1,000*l.* The archway, inscribed "GEO. G. FRED. WALLIÆ PR. REGIS SCEPTÆ RENTÆ," was opened on August 21, 1813. The Hope Insurance Company bought the undertaking in April, 1819. In 1876 the tolls on the Archway-road were abolished for a contribution of 9,000*l.*, in terms of the Holyhead and Relief Act, 24 & 25 Vict., c. 28. Ten years ago Mr. T. de Courcy Meade, then Mayor to the Local Board of Hornsey, in which parish the Archway's middle separates the parish of Islington), presented several sets of alternative plans for a new bridge of brick and stone. The old building, which possessed some dignity and character of design, was once esteemed more highly than now, inasmuch that people would make considerable journeys to it. The new bridge will be maintained as a county bridge" at the joint expense, of equal shares, of the London County and Middlesex County Councils; the Ecclesiastical Commissioners contribute 1,000*l.* to the cost, the remainder being paid, in equal shares, by the two Councils, the Vestry of Islington, and the Hornsey Local Board.

**THE** library premises in the square's north-western corner have been re-built (with an addition of Portland stone) by Messrs. William Cubitt & Co., of Gray's Inn-road, in the plans and designs of Mr. Osborne. To the former house, known as

Beauchamp House, and then numbered "12," the Library migrated, in 1845, from No. 46, Pall Mall, where it had been established in 1841. In 1879 the Committee bought, for 21,000*l.*, the freehold of the house in St. James's-square, and of some premises entered from Duke-street in the rear. The London Library was established in July, 1840, by Carlyle, Gladstone, Lord Macaulay, Sir Arthur Helps, J. Spedding, and other famous men of letters, Lord Lyttelton being the first President.

**The High Building Plague** tall "Maison de Rapport," which is called in London a House in Flats, at the corner of Rue du Sommerard and Rue de Cluny in Paris, which will entirely crush the Cluny Museum and hide its façade from general view. The matter has not passed without protest (for in Paris the public and the Press take some interest in such matters), and the Minister of Fine Arts has called on the Prefect of the Seine to bring the matter before the Municipal Council. It appears, however, that the only remedy will be for the City to make a compulsory purchase of the land "pour cause d'utilité publique," at a price to be settled by a jury, and convert it into a public square. This course would have the effect of opening the façade not only of the Cluny Museum but that of the new Sorbonne also.

**St. Giles, Cripplegate, and Milton.** A PROJECT is set on foot to lay out this burial ground as a public open space, and to erect therein a memorial to Milton. The poet was buried in, or next to, his father's grave, within the church. Aubrey says, "at the upper end of the chancel, at the right-hand"; whilst the exact spot is now unknown, the story that the remains disinterred in August, 1790, and publicly exhibited, were his, is no longer credited. On quitting Chalfont St. Giles, upon the cessation of the Great Plague, Milton returned to the small narrow-fronted house in Artillery-walk, Bunhill-fields (since absorbed into Bunhill-row) where he passed the last eight years of his life. In the church is his bust by John Bacon, the gift (1793) of Samuel Whitbread—it was placed within a canopy in 1862. The churchyard level has been considerably raised by interments during the Plague, it is bounded on one side by a bastion and part of the City wall whence the battlements, shown in the old prints, were wantonly removed in 1803, at the parishioners' expense. It may be added, in connexion with the subject, that of Milton's many homes in London not one is now standing. The researches of Professor David Masson go to show that the poet's garden-house in Aldersgate-street (1640-5) stood on the east side of what was then garden-ground behind the houses between Lamb-alley (afterwards Maidenhead-court) and the later Shaftesbury-place, on the street's east side. The house in Barbican was pulled down in 1865; and Jewin-street has been altogether rebuilt since Milton's day.

**Vandalism at Mont St. Michel.** MANY protests have been made, during the last few years, against the dyke or mole from Pontorson, on the main land, to Mont St. Michel. It is, however, undoubtedly useful, and not seriously injurious to the

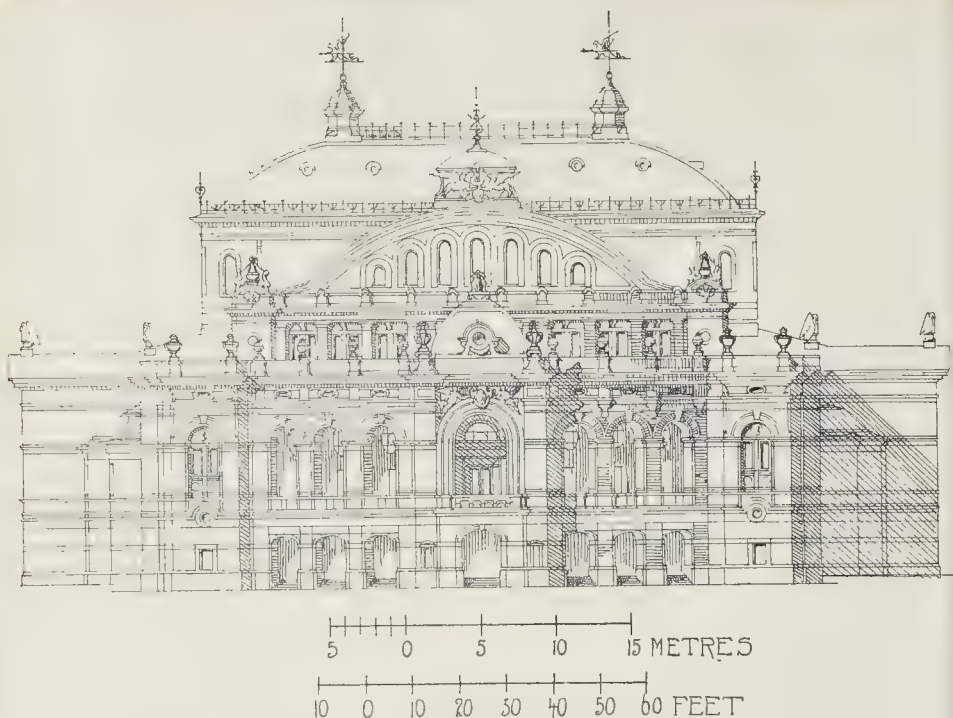
appearance of the place. But a scheme has been proposed by M. Cochery, the last Minister of Finance, which is really scandalous; viz., to establish a casino and various popular attractions at the foot of the ramparts beneath the great Mediaeval building. It seems incredible that such a thing should be even proposed, but it appears to have its supporters; though the Conseil Général de la Manche, as well as M. Selmersheim, the Inspecteur-Général of "Monuments Historiques," have protested energetically against it. Mont St. Michel has suffered enough under the hands of the restorer (and with the concurrence of the "Monuments Historiques" authorities); this would be the last and crowning degradation. But one can hardly think it possible that such a thing can really be allowed.

**The Salons and the 1900 Exhibition.** IN a Note on this subject last week, recording the protest of the Directors of the New Paris Salons against the inadequate size of the Fine Art Palaces for the exhibition, we suggested that a compulsory reduction in the number and size of the pictures exhibited would be no injury to the annual Paris exhibitions. Our contemporary, *La Construction Moderne*, in its issue of September 3, expresses the same opinion in much stronger language. If the French artists, it is observed, would remember that a Salon is a Salon and not a "Magasin des Décorés," they would not send works requiring a place as large as a railway station to hang them; and if it is demonstrated that the linear wall space in the new buildings is considerably less than in the galleries which the new exhibitions have been accustomed to, our French colleague can only rejoice that in future they will be spared the "ahurissement" and the "douleurs de tête" caused by these enormous collections of pictures; and adds:—

"Quant aux artistes, notre non moins sincère avis est qu'ils y gagneraient, tout comme leur exposition. A l'heure actuelle, si l'on veut être impartial et juger sans intérêt, sans parti pris, il y a, dans chaque exposition, un tiers d'œuvres qui sont indignes d'y figurer; un tiers d'œuvres médiocres dont on ferait mieux d'épargner la vue au public; un tiers enfin qui mérite d'être exposé."

This is just about the truth of the matter, as far as the paintings are concerned; we do not know that the same judgment could quite apply to the sculpture.

**Drawings Without Owners' Names.** We have had to insert a paragraph on our "Illustrations" page asking for the name and address of the owners of some brass rubbings and other drawings, which we are unable to return from the want of any indication of ownership. We may take this opportunity of drawing attention to the trouble which is caused to us, and the risk of loss to the owners of drawings, from the frequent practice of sending drawings without any name or address on them to show whose they are, and often without even a title to show what they are. Some people seem to think it is quite sufficient to write by a separate post that they "are sending drawings of so-and-so," leaving it to the editor to identify them by comparison with the letter; forgetting that the drawings will probably not arrive the same day as the letter, or that two or three sets of drawings, all possibly without owners' names, may be delivered here at the same time. Every



Sketch Elevation of New Theatre, Kiev. Professor Victor Schroeter, Architect.

drawing sent to the office of a paper should have the title and the owner's name and address written legibly on the margin or at the back. Senders of MSS. are usually careful about this; why senders of drawings, which are often more valuable than MSS., are so careless we cannot understand.

#### THE NEW MUNICIPAL THEATRE AT KIEV.

WE have on a former occasion referred to the International Competition held under the auspices of the St. Petersburg Architectural Society, with the view of obtaining a suitable design for the new municipal theatre at Kiev. The decision of the assessors, as we have already reported, was in favour of a scheme proposed by Professor Victor Schroeter, who holds the post of Architect-in-Chief to the Imperial Theatre Administration, and besides having recently reconstructed several of the Czar's playhouses, also has a considerable private practice. Some two years ago we published a view of Professor Schroeter's new theatre at Tiflis, in the Caucasus\*, and also some drawings of the new Imperial Opera House which the Czar proposes erecting in the capital, and we now give an elevation and plan of his design for the Kiev theatre, which is in process of construction.

The plan has been laid out on the so-called "Radial" system, with a curved front indicating the position and shape of the auditorium; it is well laid out for ingress and egress, and shows that considerable attention has been paid to the safety of the audience in case of fire. The placing of the staircases either side of the principal lounge has enabled the architect to make them a feature in the external design.

The elevation is to be of red brick with free-stone facings. The house provides accommodation for an audience of 1,500 and an orchestra of seventy. The expenditure is about 450,000 roubles.

\* See *Builder*, November 27, 1896.

#### NOTES ON THE DESIGN AND ERECTION OF ARCHITECTURAL IRONWORK.\*

DURING the last few decades considerable changes have taken place, not only in the design but in the details of construction of public buildings and business premises.

The changes have, no doubt, been principally brought about by the enormous value of land in cities and towns, the increased demand for window space, and the necessity for so-called fire-proof construction.

The great prices demanded for building sites make it incumbent upon architects to provide the largest amount of accommodation in the smallest possible space, which means increasing the height of buildings and diminishing the walls and piers to the smallest possible limits.

The demand for window space considerably diminishes the area of the external walls of buildings, and necessitates the use of other material than brick and stone to ensure stability.

The demand is brought about partly by the close packing of buildings and their increased height, partly because the buildings principally referred to are used for business purposes only (in which case abundance of light is necessary), and partly by the requirements of sanitary science.

The demand for fire-proof construction makes it necessary to use non-inflammable material wherever possible, and in many cases calls forth considerable ingenuity of design to prevent the spread of fire from one part of a building to another.

The great development which has taken place in the manufacture of iron and the consequent lowering of its cost, has made possible the many changes in construction necessitated by the changes in design, and has left the architect free and untrammelled by the want of a suitable material.

Many of the most important buildings of to-

\* A Paper read by Mr. Henry A. Cudde, Assoc. M. Inst. C.E., City Engineer of Cork, at the Dublin Congress of the Royal Institute of Public Health (Engineering and Building Construction Section).

day are virtually iron structures clothed with brick, stone, or other building material, and not only require architectural skill in their design, but the scientific knowledge of the engineer to construct the framework on which the design is hung.

The materials principally used for the framework of buildings are cast-iron, wrought iron, and steel, the determination of which material to use in any particular case depending upon the skill of the designer, the cost, and other circumstances of the particular case under consideration.

As a general rule, it may be taken that cast-iron is not the most suitable material where it would be subject to transverse stress or tension, but that it is the most suitable material in direct compression within certain limits.

Wrought iron and steel may be used under any kind of stress, but where strength only is to be considered, it is possible to use lighter sections with steel on account of its greater strength.

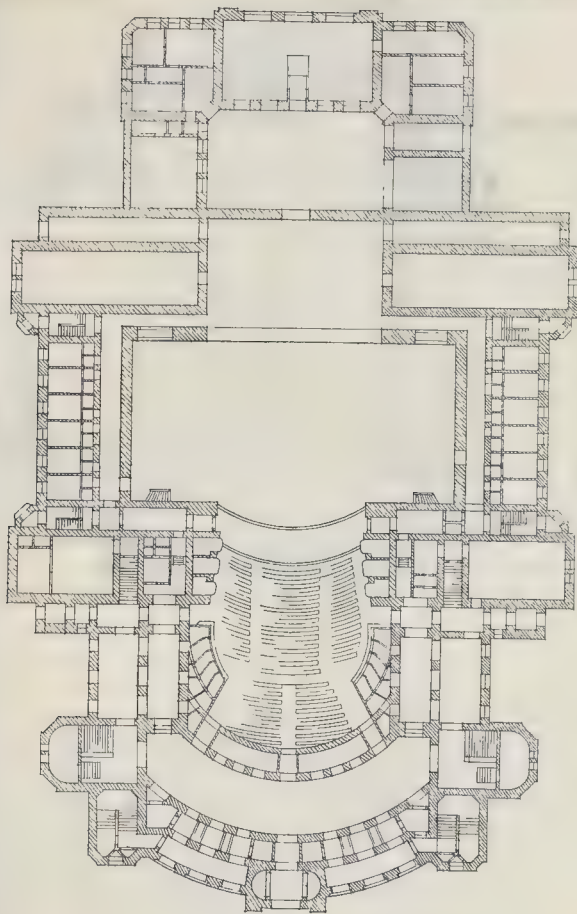
In using girders of small depth in proportion to the span, the flexibility as well as the strength must be determined, and there may occur cases where very little advantage would be obtained by the use of steel, as a heavier section might have to be used than required for strength to prevent undue deflection.

The ultimate strength of iron and steel varies considerably, but the figures in the following table may be taken in ordinary practice:—

	Tensile Strength.	Crushing Strength.	Clearing Strength.
	Tons per square inch.	Tons per square inch.	Tons.
Cast Iron .....	7	16	3
Wrought Iron .....	22	16	20
Steel .....	32	20	24

The working stresses should in no case exceed one-fourth of the ultimate strength, and in the case of stanchions for warehouses or supporting machinery or where shocks may be expected, a larger factor of safety should be used.





5 0 5 10 15 METRES  
1 1/2 0 10 20 30 40 50 60 FEET

Sketch Plan of New Theatre, Kiev.

The safe bearing stress to which materials may be subjected may be taken as follows:—  
Cast Iron ... 8 tons per square inch.  
Wrought Iron ... 5 " " "  
Steel ... 7 1/2 " " "  
Mortar ... 1/2 cwt. " " "  
Cement ... 1 " " "

The most general sections for pillars are the hollow circular column. The hollow square column, the "H" section and modifications of the same, the cruciform section, the solid circular section, and the solid square section, of which can be manufactured in either cast iron, wrought iron, or steel.

In designing pillars the form of section is not ways of moment, and it becomes a question which section will be the most economical.

To save preliminary calculations in such cases, the author has calculated the strength of hollow column 10 in. in diameter with metal 1/2 in. thick, and compared the same with the calculated strength of pillars of the sections previously mentioned, designing them with the same length, area of section, and (except in the case of the solid round and square sections), the same thickness of metal so that the weight of metal would be the same in each case.

The results of the investigation are given in the following table of relative strengths, the calculations being made on the assumption that the pillars are of cast iron rounded at both ends.

The arbitrary value of 100 was given to the hollow column to which the values for other sections are related according to their strength.

Section.	Relative strength.	Section.	Relative strength.
○	100	+	25
□	85	●	23.3
H	51	■	23

If the pillars were of wrought iron or steel, the relative strengths would be in the same order as for cast iron, and would vary but little from the values given in the tables for cast iron.

Although the hollow round and hollow square columns prove to give a far more economical distribution of metal than any other section, it must not be forgotten that it is impossible to properly calibrate the thickness of metal in castings of such sections, that they may be badly cored in their manufacture, giving more metal on one side than another, and that the unequal thickness considerably lessens the strength of the column.

The author is of opinion that a considerably

larger factor of safety should be used with castings which it is impossible to measure and examine in every part than would be necessary with other sections.

Pillars may fail by the crushing of the material of which they are made, which occurs with pillars that are short compared with their radius of gyration; by flexure, which occurs with long pillars, or by a combination of both; but no hard and fast line can be drawn between failure by crushing and failure by flexure. With short pillars the material which has the greatest unit-crushing strength will give the most economical results as regards weight, but in pillars failing by flexure the strength depends upon the modulus of elasticity of the material.

From the foregoing remarks, it will be seen that the length of a pillar may have a great deal to do with the selection of the material of which it should be made, for which purpose the following table may be of assistance, as it gives the different material in order of strength for different proportions of pillars. As an instance of the use of the table for a pillar, the length of which divided by the radius of gyration is between the limits of 1 and 50, the greatest unit strength would be obtained from cast iron, steel coming second, and wrought iron third.

Pillars with Ends Rounded.

Length Divided by Radius of Gyration.	Materials in Order of Strength.		
	Cast Iron	Steel	Wrought Iron
1 to 10	Cast Iron	Steel	Wrought Iron
10 to 50	Steel	Cast Iron	Wrought Iron
50 to 100	Steel	Wrought Iron	Cast Iron

Pillars with ends fixed.

Length divided by radius of gyration.	Material in order of strength.		
	Cast iron	Steel	Wrought iron
1 to 80	Cast iron	Steel	Wrought iron
80 to 100	Steel	Cast iron	Wrought iron
100 to 300	Steel	Wrought iron	Cast iron

When pillars carry girders, mistakes are often made in designing the seats, and it cannot be too strongly urged that the loads transmitted to pillars should be carried as near the centre of gravity of the section as possible.

The provision of girder seats, far too large for the weight to be carried, is a common error, and frequently is a source of danger, because the deflection of the girders carried cause all the weight to be thrown on the outside of the seat, and removes the centre of gravity of the load considerably away from the centre of the pillar, a condition for which it has never been calculated.

In designing the seat for a girder it is only necessary to have sufficient bearing area to prevent the safe bearing stress of the material of which the girder or the seat is made being exceeded, calculating of course on the safe bearing stress for the weaker material.

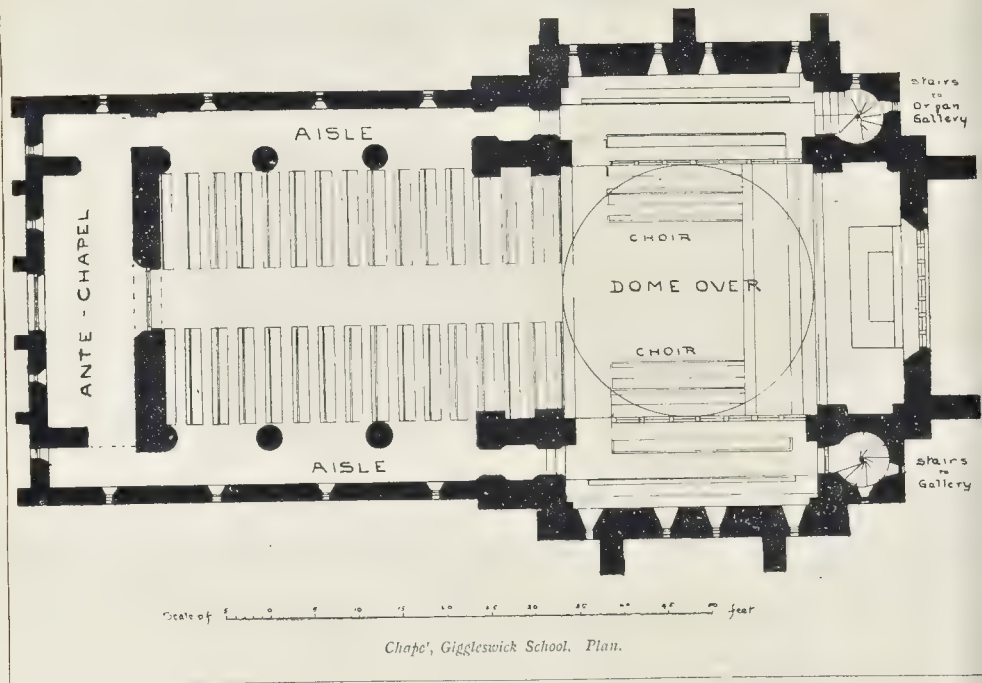
In the erection of ironwork care should be taken that girders are properly secured to stanchions or other girders which they intersect, and in most cases it is better to make use of the ends of the girders for fastening rather than securing the flanges to their seats.

It is also better practice to depend upon the clearing strength of bolts and rivets than to put them in direct tension and allow the load to be suspended from heads and nuts.

In designing the ironwork for a building it is also a matter for consideration as to what extent the framing will be required to brace the structure besides supporting vertical loads, because where lateral security is required it will be necessary to properly anchor the bases of the pillars, and in some cases make use of diagonal bracing.

In fixing the sizes of bolts to be used in securing one pillar above another and securing girders to cast-iron pillars, it is better to err on the side of safety, and it may be laid down as a rule that 1 1/2-in. bolts are the smallest that should be used, except with small girders or in special cases.

In bedding girders on iron seatings a strip of lead may be used, but where a girder or pillar is supported upon a stone template the safe unit stress is small in comparison, and some



material with considerably less resistance to crushing should be used between the surfaces.

As the strength of a stanchion largely depends upon the way in which it is fixed, a doubt often exists in the mind of the designer as to what assumption shall be made in calculating its strength; that is to say, whether he shall consider both ends to be rounded, one end fixed and one rounded, or both ends fixed, the relative strength of pillars fixed in the ways described being 1, 2, and 3 respectively.

Even when one is warranted in assuming fixity of one end or both, careless workmanship will often upset all his calculations.

In calculating pillars with flat bases, but supporting other stanchions or girders subject to a variable load, the author assumes one end to be fixed and the other rounded, but stanchions carried on others he assumes to have both ends rounded. The only cases in which he would consider both ends to be fixed are where both ends of the pillar are flat, and where the load supported is constant and evenly distributed.

For bedding a pillar the best plan, perhaps, is to make the vertical distances between the stone template and the load which the pillar is to support about 1½ in. greater than the length of the pillar. Then wedge the pillar up to its position by driving iron wedges between the template and the base of the pillar, grouting the space with neat cement.

If pillars are bedded in the way described, it is unnecessary to machine-face the base, but holes about 2 in. in diameter should be left in the base plate as near to the centre of the pillar as possible, so that the grout which is poured in from the outside between a raised mound of clay and the base will rise in the grout holes and indicate when the space is properly filled.

The top of a cast-iron pillar supporting another should be machine-faced.

Wherever ironwork is used in a building it should be covered with fire-resisting material so as to protect the supporting framework of the structure as long as possible from the influences of heat.

Many kinds of fireproof flooring are in the market, but the author would give preference to floors where the whole of the ironwork is properly protected from fire by some suitable covering.

#### UNCLAIMED DRAWINGS.

WE have on our table four sheets of rubbings of ancient brasses with no name or address on them. The owner of them will oblige by sending his address for their return; otherwise they must be destroyed. We have also a drawing of the Wolsey Palace, Winchester, with the signature of "James B. Nicol," but no address.

#### Illustrations.

##### NEW CHAPEL, GIGGLESWICK SCHOOL.

THE new chapel, of which the memorial stone was laid on October 7, 1897, occupies a site on a knoll of sandstone rock that rises steeply above the school buildings; from its position it will be a conspicuous object from the surrounding country in nearly every direction.

The plan, which is appended, consists of a Latin cross, with a dome over the crossing, surrounded at the four angles by turrets, which are crowned by small cupolas. The choir is placed under the dome, and the shallow transepts contain each a gallery, that in the north transept being intended for the organ. The school will occupy the nave, which is lit by a lofty clearstory, and has a narrow and low aisle on each side for access to the pews.

The materials will be chiefly local stones of various kinds, including a black limestone, which will be used in bands and chequers with the lighter-coloured masonry, and a red sandstone from Egremont.

Owing to the rapid fall of the ground, height is found under the chancel for a vestry, which will be reached by a stair in the north-east turret.

The dome will be of concrete and terra-cotta, with a wooden covering laid with sheet copper, and is to be surmounted by a stone lantern and a cross of gilded metal resembling those on oriental churches.

The architect is Mr. T. G. Jackson, R.A., and the work is being carried out under his direction without a contractor by Mr. R. Evans, his clerk of works.

The chapel will be heated with hot air by Messrs. Haden, of Trowbridge.

The drawing occupied a central position in

the architectural room at the last Royal Academy exhibition.

##### FAÇADE OF A TOWN HOUSE.

THIS is a design for a small house in a London street, the ground and first floor plan of which are appended. The materials proposed were red brick and Portland stone; the roof to be covered with green Westmoreland slates. The drawing was exhibited at the Royal Academy this year.

Nos. 81 and 82, FRIAR-LANE, LEICESTER.

This is a sketch elevation for a suggested rebuilding; the materials to be red brick with Weldon stone dressings; the top story to be rough-cast, with a slate roof.

M. STARMER HACKBURN.

##### CLIFF TOWERS.

THE illustration which we publish of the above house, of which Mr. C. Harris Townsend is the architect, represents the porch and a portion of the entrance front. The dwarf tower here shown is a motif which is repeated at the four corners of the building, which is so planned that all the rooms (which face the south and command a view of Salcombe Estuary) open out of wide ground and first-floor corridors or galleries on the north side. Two of the windows are seen in the illustration. The material of which the house is built is a local stone, which has a very pleasant grey-green colour, and the roof is covered with the wall and towers are green Tilberthwaite slate.

The drawing was exhibited at the Royal Academy of this year.

##### NEW ALTAR, ST. MARY'S, CHADDESDEAN, DERBY.

THIS church, which is dedicated to St. Mary, suffered much at the hands of zealous restorers in the fifties and later. It is in the Decorated and Perpendicular styles. The chancel is the oldest portion, and was originally a chapel of an adjoining parish. The modern roof is open. The greater portion of a fine fifteenth-century screen with remains of re-turned staves, pinnacles, and sedilia, and a stone gospel-book on the north chancel wall, still exist.



New Chapel  
Giggleswick School  
Yorkshire.



THE NEW CHAPEL, GIGGLESWICK SCHOOL. MR. T. G. JACKSON, R.A., ARCHT.

T. G. Jackson R.A.  
Architect.

PRINTED BY T. G. JACKSON, R.A., ARCHT.







FIRST PRIZE IN ARCHITECTURE: "A PALACE FOR ENTERTAINING THE ILLUSTRIOUS VISITORS OF LONDON"—BY M. L. GILBERT



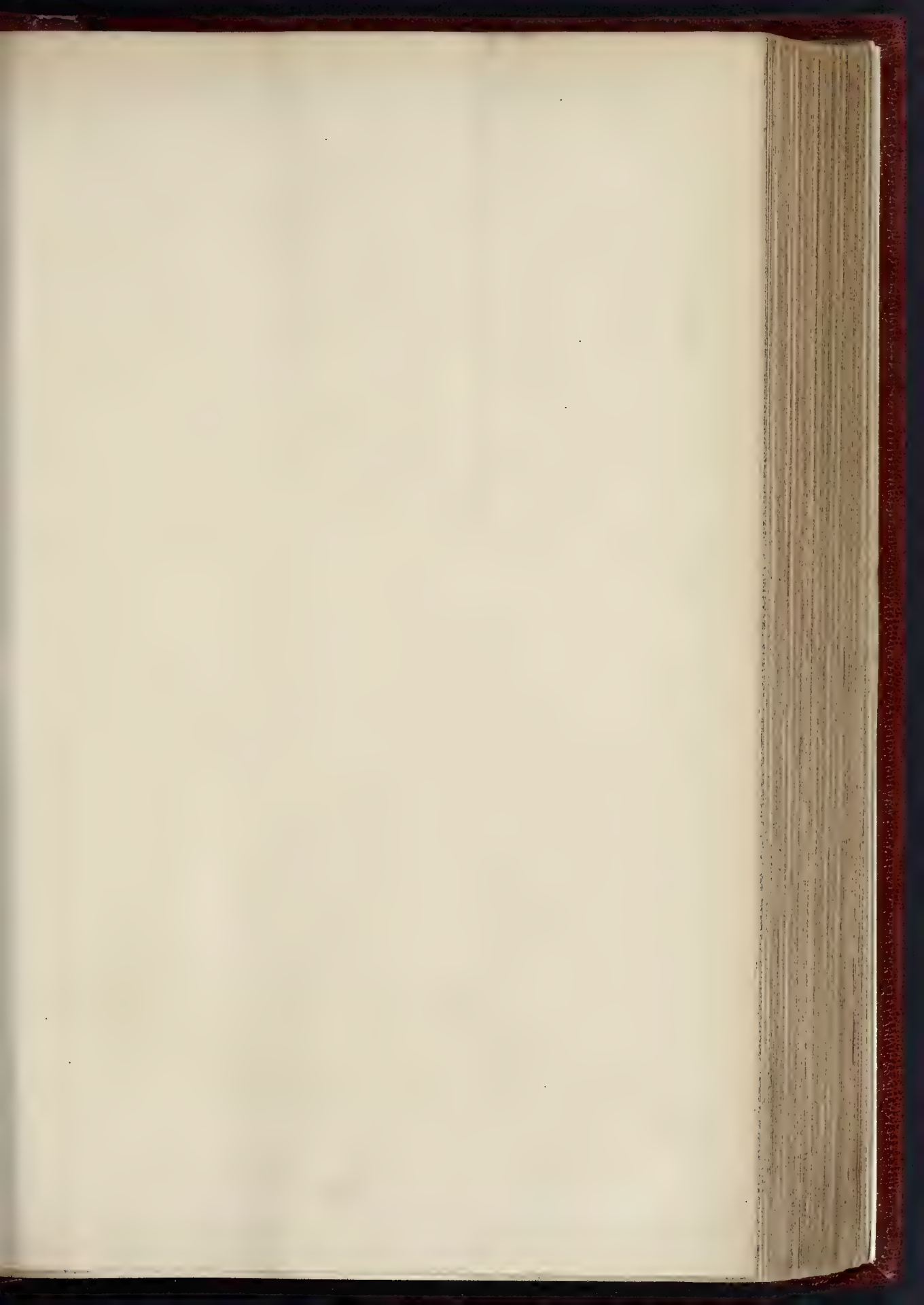
FIRST PRIZE IN PAINTING: "THE POOL OF BETHESDA"—BY M. GILBERT

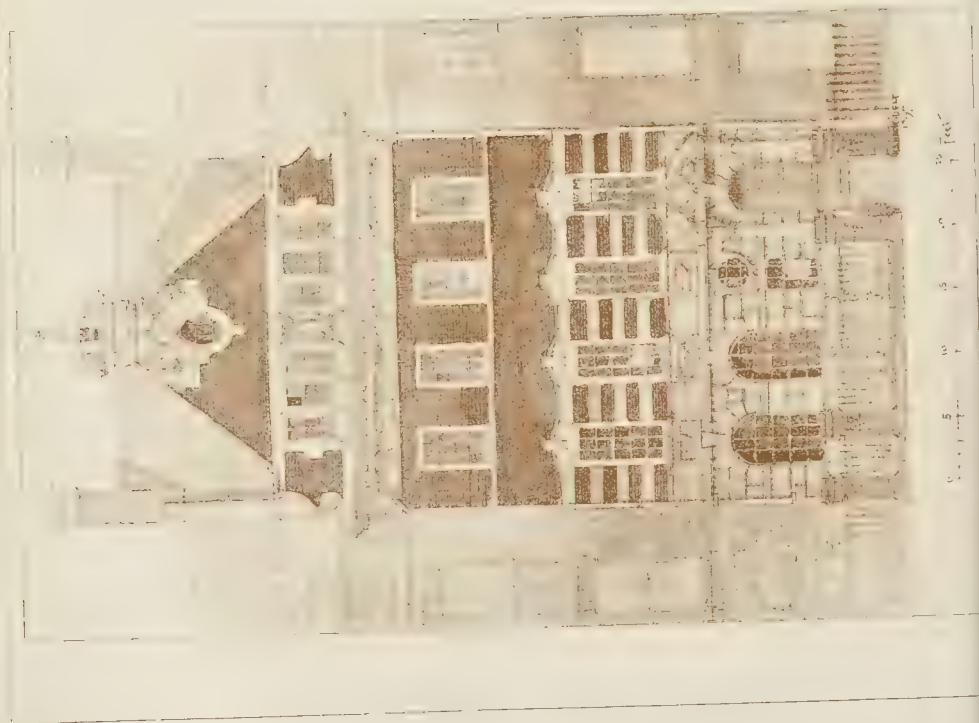


SECOND PRIZE IN SCULPTURE: "CAIN AFTER THE DEATH OF ABEL"—BY M. BOUCHER

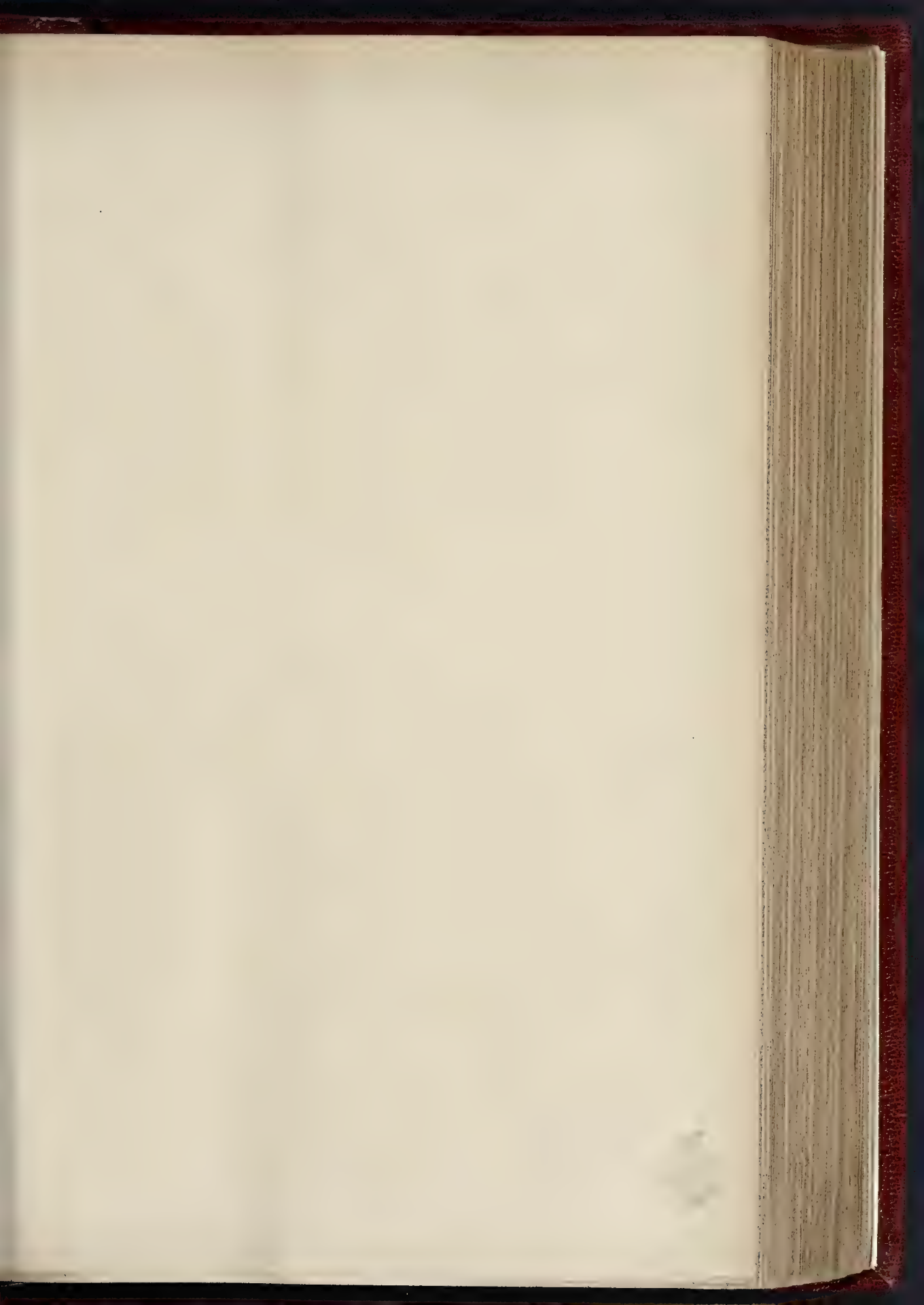














NEW ALTAR ST MARYS, CHADDESSEN, DERBY MR HENRY ROSE, ARCHITECT





CHANCEL, &c., ST. BARTHOLOMEW'S CHURCH, SOUTHSEA—MESSRS. W. A. COOMBS AND E. TOWRY WHYTE, ARCHITECTS



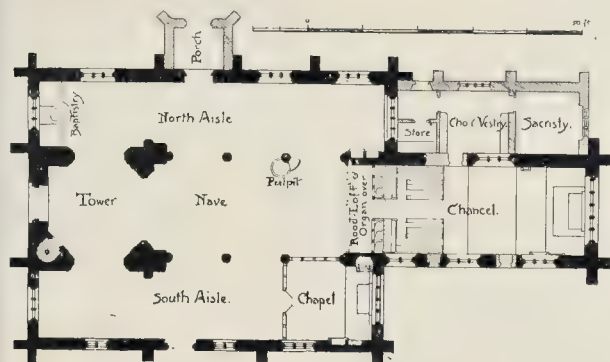
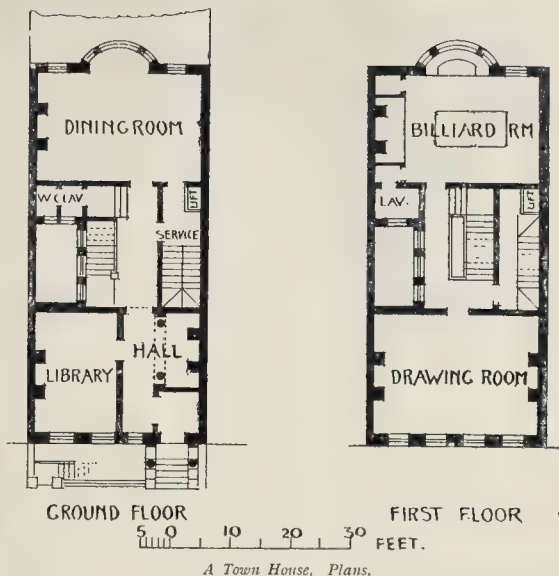




PART OF HOUSE. CLIFF TOWERS. MR. C. HARRISON TOWNSEND, F.R.I.B.A., ARCHT.







The scheme proposed comprises the construction of the upper portion of the screen, with rood and organ-loft over, and the opening up of the old rood stairs; a new reredos to the altar; the erection of a new altar, &c., in the south aisle, and a screen to form a chapel; the removal of the organ-chamber to make room for the vestry, &c., without blocking up any existing windows; a slight readjustment of steps in the chancel; the reconstruction of the north porch, which has ceased to exist; and the return of the priests' door to the position further east, from which it was removed in the sixties.

The pulpit at present stands against the chancel screen. The church contains several stained-glass windows of indifferent modern design.

Mr. H. Rose is the architect. The drawing was exhibited at the Royal Academy of last year.

#### ST. BARTHOLOMEW'S CHURCH, SOUTHEA.

The works already carried out at the above church consist of transepts, chancel, morning chapel, and vestries. The materials used are red brick with red terra-cotta dressings externally, the roofs being covered with green Westmoreland slates, red terra-cotta is also used for the arches and ornamental string courses internally, but the whole of the walls and ceiling are plastered, which is to be deco-

rated with fresco when thoroughly dry. The screen will be of cream-coloured marble and alabaster with dark marble inlays and columns. At a future date it is intended to rebuild the nave with columns and aisles, also to add a baptistry, and campanile for clock and bells. The contractor for the works is Mr. Quick, of St. John's-road, Southsea, and the clerk of works Mr. Mansel, of Gosport; the architects are Messrs. W. A. Coombs & E. Towry Whyte, of London. The drawing was exhibited at the Royal Academy of last year.

#### "PRIX DE ROME" PRIZE DRAWINGS.

The illustrations on this sheet are from three of the designs of the "Prix de Rome" students of this year, at the Ecole des Beaux-Arts, Paris. The architectural design is that which gained the Grand Prix de Rome for architecture, and is by M. Léon Chiffot, a pupil of MM. Daumet, Girault, and Esquié; the subject being "A Palace for entertaining the illustrious guests of France." A photograph of the plan was also forwarded to us, but on a much smaller scale and too weak a photograph to reproduce from. The design shows the usual scholastic quality which is in favour at the Ecole des Beaux-Arts—too much in favour, most English architects will think; but it is probable that a competitor who ventured outside these academical lines would have little chance of the prize.

The painting illustrated is that which obtained the Grand Prix for painting, and is by

M. Gibert, a pupil of M. Gerome. The subject is the descent of the angel at the pool of Bethesda. It should be added that this year the jury awarded a special "Second Grand Prix" to M. Lamarra, pupil of MM. Lefebvre, Rouguereau, and Tony Robert-Fleury, for his treatment of the same subject, as it was considered so nearly equal to that of M. Gibert that there was a difficulty in deciding between them.

The sculpture subject is that which obtained the "Second Grand Prix" in sculpture, and is by M. Boucher, a pupil of MM. Falguière and Mercié; the subject is "Cain, after the death of Abel, hears the curse of the Almighty." The photograph of the Grand Prix in sculpture, by M. Alaphilippe (pupil of M. Barrias) we have not been able to obtain.

#### MAGAZINES AND REVIEWS.

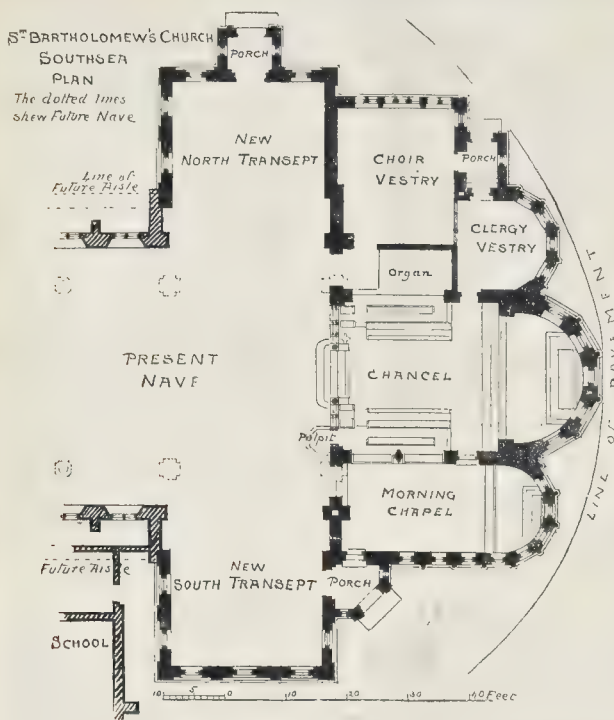
The *Architectural Review* (Boston), Vol. V., No. 5, contains elevations and details of the City Hall at Binghamton, in which the architects, Messrs. Ingle & Almirall, have endeavoured to persuade the inhabitants that they are living in a suburban district of Paris. From that point of view, the work is refined and well studied. Mr. Russell Sturgis contributes a paper on "Common-sense Planning" in which he appears to deprecate all consideration of balance and effect in plan, and regards it merely as the most convenient arrangement of rooms and doors and windows as they happen to come. What is really required at present (in this country at least) seems to be a protest in the opposite direction. The crowning merit of a good plan is not to set symmetry at defiance, but to make symmetry and convenience coincide.

The *Gazette des Beaux Arts* includes a long article by M. Jules Mommeja on "La Jeunesse d'Ingres," one of the eminent French painters of the earlier part of the century whose work is exciting a good deal of revived attention just now. It is accompanied by some reproductions of figure-studies by Ingres. The same number includes an article by M. Eugène Müntz, "Apropos de Botticelli," and one of more special interest to architects, on the ruins of Timagad or Timgad, by M. R. Cagnat, under the title "La Resurrection d'une Ville Antique." M. Cagnat's description, accompanied by some photographs, gives a good idea of the interest of this series of ruins of the time of the later Roman Empire. It is a first article only, and is to be continued. The same number includes an illustrated article on the work of Wenzel Jamnitzer, a little known Nuremberg silversmith of the sixteenth century, and one on the London exhibitions of the year, by M. Henri Frantz, the same writer who takes up the cause of Rodin's "Balzac" in the *Magazine of Art*, and whose criticism does not seem to be taken from a very central standpoint.

In the *Art Journal* Mr. F. Miller writes on the fascinating art of enamelling, and especially on the enamel work of Mr. Alexander Fisher. There is also an interesting and practical article on the working of shell cameos, by Miss Beatrice Thompson.

The *Magazine of Art* has an article of special interest on "Curious Masks among Greeks and Barbarians," with illustrations, and one on reminiscences of Samuel Prout by Mr. Collingwood, who repeats here an interesting anecdote which we remember hearing from him many years ago—how Prout was working before the porch of Chartres Cathedral, and wished he could see more of the sculpture in shadow in the upper part, when the sunlight reflected from a puddle sent a ray of light right up among the sculpture. Prout remarked he would never again be afraid of putting a light where he wanted it. M. Frantz contributes a short article on the statue of Balzac, which is beside the mark. It is quite true that Rodin's rough sketch of a statue showed a noteworthy and original conception; the question is whether any artist had a right to send such a mere crudity to an important exhibition, or expect a learned body to accept it as the statue they had commissioned.

The *Studio* (August 15) contains an illustrated paper on "Celtic Sculpture" by Mr. Romilly Allen, and one by Mr. Frederick Wedmore on the very interesting subject of "Expressive Line" in art, with some very suggestive illustrations, especially two studies of figure attitudes in ink line by M. Forain.



[See preceding page.]

The *Artist* has an article on "The Bedroom and its Furniture," with sketches of some very well designed simple furniture, praiseworthy both from an artistic and constructional point of view. Among the other contents are papers on "The Dyeing of Fabrics," and "The Printing of Wall-Papers."

The *Antiquary* contains, under the heading "Ramblings of an Antiquary," an account, with some small illustrations, of two ancient wall paintings, at the churches of Irchester and Mears-Ashby respectively, in Northamptonshire.

In *Scribner's Magazine* "The Field of Art" is occupied by Professor Goodyear with an essay on his gigantic mare's-nest in discovering geometric and optical intentions in every settlement or every irregularity of setting out in an ancient building. The last example he has got hold of is that the eastern bay of the nave of Wells is a few inches narrower than the others, and "there is no doubt that the last pair narrow to 9'12 by intention." If Professor Goodyear had realised that English Cathedrals were almost invariably built from east to west, he would have realised that this is the *first* bay in order of building instead of the last; while a glance at the plan might have suggested that its width was controlled by the width of the west aisle of the transept. There are frequent instances of the arch next the crossing being different from the more western ones, for the simple reason that the crossing was almost invariably built before the nave, but the first bay of the latter was built with it for abutment, and, where the transept had a western aisle, because it flanked that aisle; then there was frequently a pause in the building, and the remainder of the nave would be carried out by a different set of men; there is the simple practical explanation of what Professor Goodyear makes a mystery of.

In the *Century* the "Old English Masters" article and illustrations are devoted to Hopper, whom Mr. Van Dyke characterises as a follower and imitator of Reynolds, but with a spirit and a view of his own. An engraving of his excellent portrait of Pitt is given as one of the examples of his art. A note on Gilbert

Stuart, an American portrait painter of the early part of the century, educated in England, is of interest, and his portrait of "Mrs. John Travis" a very dignified one.

In the *Nineteenth Century* a paper on the "Art-Treasures of America," by Mr. William Sharp, gives some idea of the immense amount of picture-collecting which has been going on in America in recent years. An American millionaire, it appears, need not keep either race-horses or a yacht unless he cares for racing or yachting, but pictures he must have, whether he cares for them or not, or he is out of the pale of social salvation. The result is that, we are told, there is some justification for the reply of a boy to an examiner, that Barbizon was "somewhere between New York and Boston." Jules Dupré, Cazin, Benjamin-Constant, and Carolus Duran, we are told, "are better known on the banks of the Hudson than on the banks of the Thames"; which may easily be the case; the English public are almost culpably ignorant of contemporary French art. They may retort that the French are equally ignorant of contemporary English art; but the Americans seem to be pretty well acquainted with both.

*Temple Bar* contains a rather rambling article by Mr. J. C. Paget on St. Front, or, as he calls it, St. Front at Périgueux, chiefly of interest as indicating that it is now thought worth while to introduce articles on architectural subjects into popular magazines. Unfortunately the author, while he quotes Viollet-le-Duc as showing the constructive reason for pointing the round arch, is weak enough to add that "this theory in no way contradicts the popular explanation that the pointed arch arose from the crossing of the two round arches," thereby doing his best to perpetuate a popular fallacy. The leading idea of the article, that the Aquitanian architecture is the fountain head of Gothic architecture, is quite untenable. We should imagine, though no reference is made to it, that the author has been reading M. Corroyer's book—a very misleading one.

In the *Pall Mall Magazine* an article is devoted to Dalkeith Palace—more to the contents than the building; and "A Day of My

Life at Cambridge" serves as a tag whereon to hang a number of charming sketches by Mr. Raillon.

In the *Gentleman's Magazine* Mr. Harwood Brierley gives an account of the Great White Horse of Yorkshire, near Hambleton, less known or talked of than its compeer of Berkshire, perhaps because no Tom Hughes has made a novel out of it; *carci vale sacro*.

In the *Quarry* Mr. Elsdon's papers on "Applied Geology" continue to be of interest; but papers like that on "The Bridge and Cretaceous Company's Quarries" look very like "doing business" with the articles.

### COMPETITIONS.

SCHOOL BUILDINGS, GLOUCESTER.—A meeting of the members of the Gloucester School Board was held at the Guildhall on the 29th ult., to decide upon plans for a new school to be erected on the eastern boundaries of the city, and appoint an architect to carry them out. Some months ago the Board invited architects having offices in the city to send in competitive plans, for which prizes were offered. Nine plans were sent in, and were submitted to Messrs. Martin, of Birmingham, who awarded a plan submitted by Mr. A. J. Dunn the first prize, and the Board, at a subsequent meeting, confirmed the award. Dr. Hadwen moved that Mr. Dunn's plans be accepted for the construction of the schools, and that he be appointed as architect to carry them out. A long and animated discussion took place on the motion, which was opposed by the chairman, the vice-chairman, and others, who argued that Mr. Dunn's residence was in Birmingham, and his practice was there, and that, though he had an office at his father's house in Gloucester with a brass plate at the side of the door, he was not a *bona fide* resident. Moreover, the carrying out of his plans would, it was estimated, involve an expenditure of about 19,983l., whereas if the plans of Mr. Medland—who had been the Board's architect for twenty years, and who had been placed second, and which, in the opinion of some members of the Board, were superior to those which the referee had placed first—were carried out, the cost would be considerably less. On the other hand, it was argued that no evidence had been given that the cost of carrying out Mr. Dunn's plans would be so great as had been stated; that his title was perfectly *bona fide*, as he had an office in Gloucester; and that, having awarded his plans first prize, the Board were almost compelled to accept them for the new schools. Eventually Dr. Hadwen's proposition was carried by a majority of one.—*Bristol Times*.

### Books.

*The Princely Chaudos: a Memoir of James Brydges, First Duke of Chandos.* By J. ROBERT ROBINSON. London: Sampson Low, Marston, & Co., 1898.

THIS very badly-written book is stated to be a new and cheaper edition of a work already published. The greater portion of the contents belongs to general history; its only interest for architectural readers is that it gives some account of that mansion, under the name of "Canons," the mushroom erection of a mushroom Duke, the speedy appearance of which was so shrewdly prophesied by Pope. The elevation of the south front is given, showing a ground and first story of rusticated masonry, with an order of six Ionic columns on the centre portion, with cornice and attic and statues over. The principal entrance was from the high road about half a mile beyond Edgware, and it is stated that the drive was so laid out as to face the building anglewise at the outset, thus giving it greater size in the distant view. The walls were 12 ft. thick in the foundations, reduced to 9 ft. above the ground level. The total disappearance of such a structure almost immediately after the first owner's death is a curious and perhaps almost unexampled incident in the history of great mansions. The Duke had encumbered the estate in order to keep up his magnificence during his life, and everything had to be sold to pay off the liabilities. The mansion was simply sold off in lots, as building material. Some notes are given as to the fate of some portions of the house. The marble staircase and columns were erected in the



house then Lord Chesterfield's in Mayfair, where they still are. A good many details in respect to other objects are given, but with the intimation that the authority for them is doubtful.

*The Young Estate Manager's Guide.* By RICHARD HENDERSON, Member of the Surveyors' Institution, &c., with introduction by R. PATRICK WRIGHT, F.R.S.E., Professor of Agriculture, Glasgow and West of Scotland Technical College, Edinburgh and London: William Blackwood & Sons, 1898.

PROFESSOR WRIGHT, in his well-written introduction to this little volume, plays the part of admiring friend, and expresses so high an opinion of Mr. Henderson's qualifications for the task of Mentor to the young estate-manager, that the ordinary critic is almost afraid to venture on a word of disparage. "The special value of this book," he tells us "lies in the fact that it is a record of the results of prolonged experience, of observation, and of reflection by a man whose education, and whose familiarity both with the science and the practice of agriculture have given him exceptional qualifications, and who has had ample opportunities of submitting his conclusions to the test of actual trial." After all this one is tempted to ask if Mr. Henderson, during his "prolonged experience," ever heard of a damp-proof course, and of its sanitary importance. Certain it is that we can find no mention of such a thing, either in the index or text, and that the illustration on page 43 does not show one. The illustrations as a whole are indeed the worst part of the book, perhaps the very worst being the drawing of a kingpost roof-truss, in which the struts spring from below the shoulders of the kingpost, and the diameter of the ridge-roll is equal to the depth of the tie-beam.

The scope of the book is wide, including six chapters on the various building trades, three on the design, specification, and sanitation of the "farm-stead," and other chapters on land-drainage, forestry, fences, roads, water-supply, and accounting. There is also a good index. The several subjects are discussed at such length as the limits of the book will allow, and Mr. Henderson has undoubtedly condensed a great deal of valuable information into a small space. The chapters on general estate work are the best, and will be of great service not to the young student only, but also to the student of larger growth. The chapters on building are the weakest; a man who knew his subject would scarcely make the contradictory statements about "freeclay bricks," which appear on pages 16 and 18; on page 16 we have, "Besides, it exposed it is questionable if they would stand weather well," and on page 18, "they are likely, one would think, to be able to hold out well against the destructive powers of a changeable climate." The statements on page 89, about lead-poisoning, are scarcely correct; even pure water will, in the presence of air, dissolve lead, although, of course, not to the extent that (say) moorland-water will. We are glad to find that Mr. Henderson is alive to the prevalence of tuberculosis among dairy cows; and attributes it to the insanitary conditions in which they live; his remarks on the sanitation and ventilation of cow-houses are worth serious consideration by farmers and estate agents.

Many of the building terms used in the book sound strange to southern ears, but will doubtless be intelligible to the young Scot, for whom chiefly the book appears to have been written. We have pointed out a few blemishes in Mr. Henderson's work, but in the main, to use the stereotyped formula, "it fills a long-felt gap," and will be a boon to the estate manager, young and old.

*Journal of the Sanitary Institute.* Vol. XIX., Part II. London, 1898.

The journals of learned societies are usually interesting and up to date, and this under notice is no exception to the rule. The three papers it contains will all well repay perusal. The first, by Professor J. Lane Nutter, M.A., M.D., deals with the "Purification of water for barracks, prisons, and other institutions." The filtration of water on a small scale is first considered, but the matter scarcely goes beyond the researches of Drs. Sims Woodhead and Cartwright Wood, published in the *British Medical Journal* at the beginning of this year. The latter part of the paper treats of the sterilisation of water, and contains a record of experi-

ments made by Professor Nutter on the sterilisation of water by means of a small proportion of a solution of bromine, the water being afterwards decolourised by a solution of hyposulphite of sodium. In the discussion which followed the reading of the paper the possibility of danger resulting from the drinking of water containing bromine was mentioned, but the Professor withheld his opinion on the point. Dr. Child's paper on "Water-borne typhoid fever" is chiefly valuable for his insistence on the fact that typhoid fever may be not only water-borne but air-borne. The third paper is on "The desirability of making watershed areas and sanitary districts coterminous," and the writer, Mr. R. E. Middleton, M.Inst.C.E., presents a strong case in favour of the suggested reform. When we read that "the watershed of the Severn affects twelve counties and some 1,316 Councils," and that "the Cambridgeshire Ouse touches eight counties and some 1,200 Councils," we can form some idea of the conflicting interests which militate against the purification of the rivers in question. Mr. Middleton's plea is for a central authority for each watershed area, whose duties "should consist in the conservation of the river, its banks, and navigation, if any; in the maintenance of its purity, including that of its tributaries; in the encouragement of combination and efficiency in sewage disposal; and in the prevention of floods." An important and useful feature of the *Journal* is a list of articles relating to public health, which have appeared in recent British and foreign journals and transactions, the *Builder* not being overlooked. We can recommend the *Journal* of the Sanitary Institute to all persons interested in sanitation.

*Arnold's Scale Drawing Sheets; with Explanatory Notes.* By A. W. F. LANGHAM and A. WHILLIER. London: Edward Arnold, 1898.

THIS is a set of twenty diagram sheets, large enough to be visible to a whole class when hung up, and intended to form object lessons for beginners in learning to draw to scale; commencing with the formation of the scales themselves, and the use of set-squares, and proceeding to the geometrical drawing of simple objects according to scale. The diagrams, of which there are twenty, are numbered, and accompanied by an explanatory pamphlet with corresponding numbers; the explanations being written by Mr. Langham, Inspector of drawing under the London School Board, and Mr. Whillier, assistant organiser in manual training and woodwork under the same Board. The diagrams are very clear and comprehensible, and are likely to be of use to instructors in primary drawing. We may remark, however, that in introducing isometrical drawing, it should have been definitely explained what is the difference between this and perspective drawing, and that isometrical drawing does not show things as they can ever really appear. Without some such caution, beginners will be apt to think that in drawing the isometrical view of a circular grindstone on sheet 20, they have made a perspective representation of it, whereas they have only really drawn two perspective circles of the same size at a little distance from each other; the difference in appearance is very slight, though the difference in principle is so great.

*Wireless Telegraphy Popularly Explained.* By RICHARD KEER, F.G.S. London: Seeley & Co., Limited, 1898.

THIS interesting little book describes in a popular manner what has been accomplished up to the present time in telegraphy through space without connecting wires. Mr. Keer's historical survey is unbiased, and he has succeeded in giving due praise to some of the pioneers in this new system of telegraphy. The descriptions of the apparatus, although untechnical, are accurate, and can be understood by the general reader. As this system will in the near future be used for many important practical purposes, we welcome this book as a good attempt to explain to the general public the principles underlying this recent application of electricity.

*Electric Wiring and Fitting Details Book.* By W. PERREN MAYCOCK, M.I.E.E. London: Whitaker & Co.

THIS is simply a large book of tear-out leaves ruled for directions for electric wiring, with

vertical columns headed "Floor," "Item," "Description of Fittings with Catalogue Numbers," "Lamps," "C.P.," "Circuit," and "Remarks." At the foot of each ruled page is a space for "Wiring Diagram."

*Illustrated List of Exhibits to which medals have been awarded at the Exhibitions in connexion with Congresses of the Sanitary Institute.* London: Offices of the Sanitary Institute, 1898.

THIS book forms a kind of illustrated *catalogue raisonné* of some three hundred appliances or inventions which the Sanitary Institute have thought worth the award of a medal. It is not to be supposed that it necessarily contains the pick of recent patents and inventions, but it contains a good many which are of practical value, and it is stated in the preface that the judges laid it down as a guiding principle that awards should be made in the interests of the public; and that, as a rule, no award was given to any exhibit unless some of the judges knew by experience that it was of value, or unless it had been subjected to special practical tests during the continuance of the Exhibition. It is therefore a book which architects may find useful for reference.

#### TRADE CATALOGUES.

MESSRS. KENNEDY & BOWDEN, "artists in stained glass and sanitary decoration," (Oxford and Reading) send us two illustrated catalogues of their work in stained glass, brass church furniture, domestic ornamental glazing, &c.—"The Sanitary Auger Syndicate" (London) send us a circular and illustration of their "Patent Flexible Auger," the object of which is to clear out traps and drains. The following is part of the description of the implement:—"It enters from the manhole, inspection, or 'S' trap, and is pushed down, making all the bends and turns, going 10 ft., 12 ft. or more. When the obstruction (of whatever nature) is reached, if it is of a metallic nature, such as a tin can, broken China, brush, stick, &c., it first passes in somewhat like a closed umbrella, and then by withdrawing the auger the cone on the end opens and brings back the obstruction at once. If the obstruction is lint, paper, or cloth, the corkscrew at the end of the auger bores into it and is brought back." The list of articles which it has already brought out of traps and drains is curious and formidable.—Messrs. College & Bridgen (Wolverhampton) send us an illustrated leaflet of their two forms of wrought steel sink, the "Eclipse" and the "Special," enamelled white inside; they have the advantages of lightness and economy and take up little space, and would be very useful for the smaller class of houses.

—Messrs. J. Duckett & Son (Burnley) send us an illustrated sheet of their self-cleansing channel gully, intercepting trap, and automatic slop-water closet, with a three-gallon automatic tipper; this last we think we have noticed before, but there is some interest attaching to it now from the fact, as certified in an extract from a Sheffield paper, that the Corporation of Lincoln condemned these closets recently in some houses erected by a local builder, inserting their own pattern and charging the builder for the work. He refused to pay, and appealed to the Local Government Board, who ratified the slop closet, and not only exonerated the builder from paying, but obliged the Lincoln Corporation to pay their (the Board's) costs. This was certainly a triumph both for the builder and for the manufacturers of the closets in question, and is a decision which should be put on record; we did not receive any report of the case at the time it occurred. Of course, it must be remembered that the efficiency of such a slop closet depends entirely on the house furnishing "slops" enough for a frequent charge of the tipper, and we believe we pointed out before that the discharge of the tipper, placed just above the trap, could not have the same scouring force as a discharge from an over-head supply cistern. That is the weak point, though the closet is undoubtedly an ingenious and for some classes of property a useful one.

SLAUGHTER HOUSES, BLYTH, NORTHUMBERLAND.—A Local Government Board inquiry was held in the Mechanics' Hall, Blyth, on Thursday, the 1st inst., relative to application from the South Blyth Urban Council for sanction to borrow £250l. for the building of new slaughter houses at Blyth.



## Correspondence.

To the Editor of THE BUILDER.

THOMAS DREW, ARCHITECT, 1760 (7).

SIR,—Can any reader of the *Builder* kindly turn up any record of one Thomas Drew, architect, stated by his direct lineal descendant to have lived in Sloane-street, and to have been engaged in works at historical Sion House? Brewer, in the fifth volume of "Brayley's Topographical History," 1816, in his notice of Sion or Syon House, gives the date of its last important rebuilding as 1790, and "supposed to be" under Inigo Jones.\* A subsequent allusion is made to further additions or beautification under Adam. Is this to be taken (as in Ireland, where there is much delicate work in the manner of Adam—of the Wedgwood era, which the brothers Adam never saw or heard of) as a generic term? Is there any remembrance of an architect named Drew, of Sloane-street, who a hundred years ago may have designed works at Sion House in the prevailing Wedgwood mode, which many contemporary architects affected as well as the Adams?

THOMAS DREW, F.R.I.B.A.

Dublin, September 6, 1898.

## JAMES II.'S STATUE, WHITEHALL.

SIR,—In your article "On Architectural Inscriptions and Insignia" of September 3, the lettering on the pedestal is described as being a recent addition. In "A New View of London," 1708 (by Hatton), the inscription is given thus: "Jacobus Secundus Del Gratia Anglie, Scotie, Francie, and Hibernie Rex, Fidel Defensor, MDCLXXXI," and so in effect it has stood to our own day. Hatton has "&" for "et," and omits "Anno" before the date. For "Jacobus" was cut "Jacobi" (possibly since his time, for he says the inscription is "almost worn out"), a mistake rectified since 1844; yet "Gratie" for "Gratia" remained when I copied the inscription two years ago.

If the statue was popularly known as Julius Cæsar's, the belief, perhaps, formed an unconscious tribute to the beauty of its classical design.

In "London, Past and Present" it is stated (wrongly) that the statue is of lead. D. M.

APPOINTMENT OF ARCHITECT,  
SALFORD WORKHOUSE.

SIR,—The letter from "Vitruvius" on the above matter in your issue of August 27, prompts me to say that I was amongst those who declined to accept the terms offered by the Guardians.

I think Messrs. Worthington are wrong in stating that three architects gave way, as according to my recollection it was four out of the seven who agreed to the terms proposed, and three (Messrs. Worthington, myself, and another gentleman who will no doubt speak for himself) who withdrew from the competition when the Guardians declined to alter the terms of remuneration.

JAMES B. PROADRENT.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—XI.

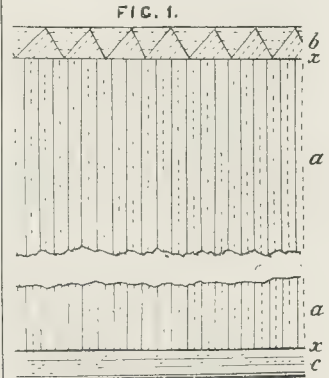
SOUND: WALL LININGS.

WE have already given some idea of the class of materials a sound-proof partition-wall should be made of. In further considering the practical applications of the science of acoustics it will be well to pursue the subject of the actual construction of the linings of sound-proof walls in general, confining our attention, at first, to linings of wood. The ideal lining, perhaps, is a substance without fibre in it, seeing that fibres act as "conducting wires"; and if a fibrous material is employed the fibres should be broken off and rendered as discontinuous as may be.

We cannot get wood without fibre, or at least a series of general directions in which which act as pseudo-fibres, disturbing the homogeneity of the material and therefore promoting the propagation of sound within it. By careful selection we may be able to find certain varieties of wood in which the fibres are to some extent discontinuous, or where the size of the conducting cells is so variable as to act as an impediment to the propagation of sound. Again, many varieties of wood may be found in which the same phenomena could be brought about by extreme irregularity of growth of the tree and the accompanying development of knots. But, unfortunately, it so happens

with the commoner kinds of timber employed in Great Britain that the best to conform with the conditions we have laid down is either extremely soft or very hard. Under these circumstances, it will be desirable, from a practical standpoint, to see whether art cannot assist Nature to bring about the desired result. In other words, after having selected a fairly suitable wood, let us see whether we cannot assist it in its capacity of a sound-proof material by constructing the lining made of it in a special fashion. We give some examples in illustration of the modes of construction suggested:—

Fig. 1.—In this we have the main part of the wall lined with narrow strips of wood, *a*, running up and down perpendicularly. The direction of the grain of the wood, or at least the general trend of it, ignoring knots, is shown by the dotted lines— and this method is adopted in the other diagrams in this article also. The perpendicular strips are cut off near



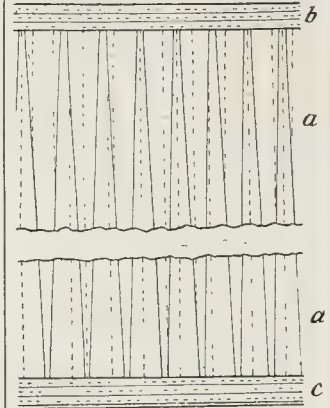
the ceiling by a horizontal band of parquetry, *b*, which may be plain as shown or dog-toothed or ornamented in any way, provided the principle is observed. *c* is a horizontal cut-off acting as the skirting, which consists of strips of wood. It will be understood that *b* and *c* are not in any way fixed to the face of *a*, being merely joined to *a* along the line *x*. If *b* and *c* project beyond the surface of *a* it will only be because the wood of which they are made is thicker. There is not the slightest objection from an acoustic standpoint, however, to the surfaces of both *b* and *c* being made flush with *a*, and then any desired mouldings or other ornamentations being fixed to them. It is a *sine qua non*, however, that the whole *a*, *b*, and *c* shall be fixed in the wall, as, if any spaces are left behind, they would act as a species of imperfect sounding-board.

The student who has carefully followed the preceding articles will readily perceive the cause of this. This plan of construction is by no means the best, as will be immediately seen, but it is preferable to ordinary methods, and is here described as being cheaper than some of the designs which follow. The principle (see our observations on the velocity of sound) may thus be described. The sound on striking *a* runs up the longitudinal fibres to *b*, or down to *c*. At the point *x*, these fibres being cut off, the propagation is impeded and the sound is distributed. In the case of *b* it is partially collected and re-directed obliquely, but is again seriously interfered with by those triangular pieces of parquetry next the ceiling which, as will be seen, have a horizontal grain. The direction of the sound is there turned round on itself, so to speak, and is largely prevented from penetrating (by means of the wall, at any rate) to the room above. If there be no room above, then the whole of *b* may be dispensed with. The sound travelling down to *c* is suddenly impeded at the point *x*, and *c* may be constructed as shown or like *b*, the object of our showing it as it is being merely to indicate a possible difference of construction. Of course, *b* "breaks up" the sound better. In regard to the width of the strips in *a*, care must be taken that they are not too narrow, for they would then tend to act as so many vibrating rods and give more work for *b* and *c* to do. (See ante p. 101 as to phenomena accompanying the vibration of rods.) Three inches would be a convenient width for the strips lining a wall

say 14 ft. in height. With increase of height there should be an increase in the width of the strips up to, say, 7 in.—as in the case of a large hall. The lining of the latter, however, should, preferably, be constructed on the plan suggested in figs. 3 and 4.

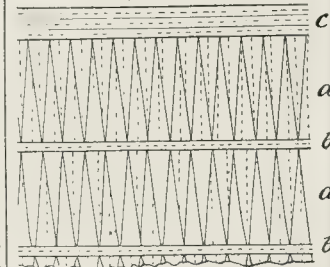
Fig. 2.—The weakest part of the design fig. 1, as the wainscoting of a large room, is in

FIG. 2.



the part *a*; economy in price, as already stated, dictated that method. In the design fig. 2 the method of the whole is practically the same, with the exception of the part *a*. The construction of *b* and *c* in fig. 2 is like that of *c* in fig. 1, and the same observations apply. The student is aware that the object of the narrow strips in fig. 1 is to break up the sound tending to run along the horizontal fibres, or "rings,"

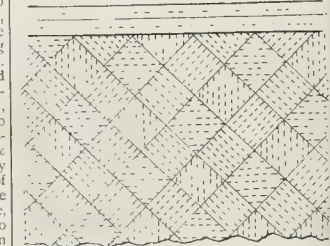
FIG. 3.



in the wood. The same object is effected by *a* in fig. 2; but, in addition, a large number of the perpendicular fibres are intersected by reason of the narrow strips being alternately tapered off, in the manner shown in the diagram.

Fig. 3.—A modification of the last method, in which the perpendicular strips, *a*, are much shorter and run in tiers, divided by one or

FIG. 4.



more strips of wood, *b*, arranged with the fibres running horizontally. This is a more expensive form of lining or wainscoting, and is more effective as a sound-proof construction,

\* It is possible that any writer can have said anything so absurd! Inigo Jones's date 1632.



the propagation of the sound being interfered with in so many directions. It would be still more effective were the alternate perpendicular strips cut with the grain horizontal.

Fig. 4.—In this, which is a species of parquet wainscoting, the wood is cut in small squares, and being taken in fitting them together that the grain of adjacent squares shall not run in the same direction. This plan admits, also, of pentagonal, hexagonal, octagonal, &c., pieces being used instead of squares.

The student will perceive that these designs are susceptible of much modification; once the principle is grasped—that the sound striking the wall must as soon as possible be dispersed and not allowed to run far in any direction—the design becomes merely one of economic interest, within certain limits. Should it be desired, with such constructions as depicted in figs. 1-3, to prevent the sound penetrating perpendicular corners of walls, the "cut-offs" *b* and *c* (figs. 1 and 2) can also be placed in those positions.

#### OBITUARY.

MR. CHARLES PARSONS, OF BURNLEY.—We have to record the death of Mr. Charles Parsons, architect and surveyor, Burnley, in his thirty-eighth year. He was elected to the Burnley Town Council in 1890, and latterly had been a most active and respected member of the Corporation. He was elected chairman of the Gas Committee on the death of Alderman Collinge last year.

#### GENERAL BUILDING NEWS.

NEW UNIONIST CLUB, ABERDEEN.—The new Unionist clubhouse and Hall, Aberdeen, are almost completed, and will be opened by the Marquis of Lorne early next month. The building has frontages to Rosemount viaduct, Union terrace, Shenneterrace, and North Silver-street, and the front line is curved. The structure is a fine Classic building in granite and is three stories high. There are three shops on the ground floor, the floors above being devoted to uses of the club. The central portion of the elevation rises to a height of 64 ft. above the ground level. The entrance doors to the club-rooms have arched heads, and are flanked by pilasters with obelisks above. The hall is 75 ft. long and 42 ft. wide, and from the floor to the coved ceiling there is a height of 26 ft. There is a small gallery in the hall. There are also kitchen, buffet, pantry, and lift to refreshment-room on the second floor. The refreshment-room likewise includes smoking-room, lavatories, committee-room, recreation-room; caretaker's-parlour, kitchen, and scullery; billiard-room, 55 ft. by 42 ft.; second ditto, 32 ft. by 42 ft.; and bedroom and pantries. The heating will be done by steam-pipes, and the lighting by electricity. The total cost, exclusive of furnishings, is 10,000. The architect is Mr. A. H. L. McKinnon, Aberdeen; and the contractors are—Mason-work, E. Gould & Co.; carpentry, Jno. Henderson; slating, G. Farquhar & Co.; painting, Mason & Son; iron-work, G. Bisset; plastering, J. Stephen & Son; plumber's work, electrical lighting, and heating, Walter Simpson—all of Aberdeen.

CHURCH EXTENSION, CLEETHORPES.—On the 31st ult. a commemorative stone was laid in St. Aidan's Church Institute and Sunday School, Cleethorpes, by the Mayor of Grimsby. The estimated cost of the building is 1,500. Mr. C. Hodgson Fowler, F.S.A., of Durham, is the architect.

WESLEYAN HOMES, FILLONGLEY, NEAR BIRMINGHAM.—The foundation stones of some cottage homes which are being erected at Fillongley were laid the other day. The houses are intended for the occupation of aged Wesleyan preachers, and are estimated to cost 1,253. Mr. J. T. Yates is the architect.

DRINKING FOUNTAIN, STOKES BISHOP, BRISTOL.—A fountain presented as a jubilee gift to Stokes Bishop has recently been put into operation by the Duchess of Beaufort. The structure occupies a three-cornered site fronting the main road in the village. It is of Aberdeen granite, and is placed in the centre of an octagonal shelter, with an approach at four sides, and is raised on three Pennant stone steps. The roof of the shelter is covered with Broseley tiles, surmounted by a lead apex and finial, and by an ornamental structure of oak posts and balusters, with arched panelled head and frieze, having an inscription in raised letters. The base consists of red Mansfield stone, panelled, and dog troughs of Pennant stone are placed at each of the four sides. The work has been carried out by Messrs. Cowlin & Son. The architect was Mr. C. A. Rowley, of Bristol.

BUILDING ACTIVITY IN DEWSBURY.—At the present time a considerable amount of building work is being carried out in Dewsbury. Amongst other things contractors are engaged in the erection of a large wing at the Technical School, an addition of a score of rooms or more. The architect is Mr. John Lane Fox, of Dewsbury. He is also engaged in the construction of a wing at the east end of the

Masonic Temple (St. John's Lodge), in Halifax-road. It will provide a new and commodious billiard-room, with supper-room over, besides other accommodation. Mr. Fox has likewise in hand new banking premises near the Market-place for the London and Yorkshire Bank, Limited. The cellaring is practically completed, and the granite walls of the first floor elevation will soon appear. Messrs. John Kirk & Sons, architects, Dewsbury, are preparing plans for an addition to the premises of the West Riding Union Bank. They will provide for an additional strong room and offices. The addition will be in the same style of architecture as the main building. The same firm is erecting more villas on the Carrett estate. Contractors have commenced operations at the north end of the intended arcade from the Market-place. Near the north end of the arcade three shops having a frontage to Corporation-street are about to be erected from the designs of Messrs. C. H. Marriott & Son, architects. For some months past alterations and improvements to the Central Stores of the Co-operative Society have been in operation, from designs by Messrs. Holton & Fox, architects, of Dewsbury, and it is expected that nearly half a year will elapse ere they are completed. Two shops and residences in Northgate are being razed to the ground, and Messrs. Holton & Fox will erect shops and houses for business purposes thereon, after setting back to the new building line fixed by the Corporation. These are the chief improvements now being effected in Dewsbury, but it may be mentioned that Messrs. D. & W. Thornton, architects, Dewsbury, are completing the erection of a large warehouse in Crakenedge-lane, near the intended new market-square. Three shops at the south end of Union-street are almost out of the builders' hands.

HOTEL, CULTER, ABERDEEN.—The hotel which is now being erected at Culter, on the main road from Aberdeen to Banochry, will form one of the largest buildings in the place. The front elevation is to be built of Kemnay granite, and will have a verandah with a balcony in the centre between the projecting cross wings. The ground floor will contain a coffee-room, smoking-room, sitting-room, still-room, with bar at back entering off the side road, and kitchen and other accommodation. The first and second floors will have three sitting-rooms and fifteen bed-rooms, with bath-room and lavatory accommodation on each floor. The whole of the internal furnishings will be of varnished pitch pine. The estimated cost is 3,000. The following are the various contractors:—F. Morrison, Culter, mason; J. Forbes, Aberdeen, carpenter; J. Campbell, Aberdeen, plumber; Roger & Baxter, Aberdeen, plasterers; G. Farquhar, Aberdeen, slater; W. Philip, Aberdeen, painter and glazier; Shirras, Laing, & Co., Aberdeen, bellhangers. The architect is Mr. John Rust, of Aberdeen.

HOTEL, SEA-ROAD, BEXHILL, SUSSEX.—The "Sussex Hotel," about to be erected at the corner of Sea-road and Jameson-road, Bexhill, in addition to smoking-rooms and billiard-room, will have large coffee and reading rooms besides the usual sitting and drawing rooms. There will be thirty-one bedrooms. The architect is Mr. A. C. D. Hicks, of Bexhill.

ALTERATIONS AT THE GUILDHALL, NEWCASTLE-ON-TYNE.—The interior of the old Guildhall at Newcastle has been completely transformed by the alterations recently effected within it, and the "new Exchange" was opened for the transaction of business on the 30th ult. In the work of alteration the ten heavy stone piers carrying the arches which supported the north wall and floor of the Guildhall have been removed, the superstructure now being carried on steel girders, resting on four steel stanchions. The work of demolishing the old interior and substituting the new was one in which the greatest care was necessary, the more so as the Exchange business had all the time to be carried on from the floor above. Under the new scheme the Exchange proper covers an area of 3,000 square feet, with a cubical space of 77,000 ft., and it has entrances, on the north from the Sandhill, and on the south from the Quayside. On the left of the Sandhill entrance are the porter's, reading, and manager's rooms, with retiring accommodation. Adjoining the entrance from the Quayside are the writing-room, accommodation for the Chamber of Commerce, telegraph and telephone area, 648 smoking-room. These apartments, all well lighted, are separated from the Exchange proper by glazed screens. The reading room occupies the eastern end of the building. In the Exchange, increased height has been effected by lowering the old floor 2 ft. 4 in., giving a height to the Exchange of 20 ft. 6 in. The windows have been increased in size, and now have a lighting area of 648 square feet, as against 370 square feet formerly. The floors are covered with wood-block flooring, supplied and fixed by Messrs. Greary & Walker, of London. The heating is by hot water on the low-pressure system the ventilation, is effected by the introduction of fresh air on the Tobins tube principle, the foul air being extracted by a large glass-culman fan, worked by an electric motor, and supplied by Messrs. Henry Walker & Son of Newcastle. The decorative fibrous plaster work has been modelled and carried out by Mr. W. R. Dodds, of Jarrold, the general contractor being Mr. Thomas Lumsden, of Jarrold. The supporting steel stanchions are encased in fibrous plaster

columns, and finished in Ionic caps below the girders, which are also encased in plaster, moulded, the cross beams resting at the walls on plasters treated in a similar way to the columns. Messrs. Armstrong & Knowles, of 38, Grainger-street West, Newcastle, are the architects.

BUSINESS PREMISES, COMMERCIAL-ROAD, PORTSMOUTH.—Large offices, erected for Messrs. King & King, auctioneers, of Portsea, have recently been completed in Commercial-road. The front is built of Portland stone; there is a mansard roof, covered with patent copper tiles of a Renaissance design. The doorway, which is on the right hand side, gives entrance to a wide corridor, paved with Terrazo mosaic. On the right hand are blue cloth-covered panels, and on the left are the public offices, with mahogany fittings, and paved with Terrazo in front and wood blocks behind the counter. Opening from the offices is the strong room, which is 8 ft. by 6 ft. A private office is close by. The corridor leads into the property sale-room, which is 42 ft. long by 28 ft. wide. It is lighted by means of a large rectangular lantern, and has a cove ceiling with moulded ribs, and a dado of incrusta walton. The dado is teak-coloured and a rail of polished teak separates it from the wall-paper. The furniture sale-room and store have a separate entrance in Swan-street. The sale-room is about 60 ft. long by 30 ft. broad, and, like the rest of the ground floor, has wood-block flooring. Above is the furniture store, communicating with the sale-room by means of a hatchway and a staircase. Goods can be taken in and out both through the hatchway and, by means of tackle, from the yard at the side. A clerks' office separates the furniture sale-room from the property sale-room. The private offices of the principals of the firm are upstairs, overlooking Commercial-road. All the rooms are fitted with the electric light. The caretaker's apartments are on the top floor, and comprise a suite of two bedrooms, a sitting-room, kitchen, pantry, &c. The builders are Messrs. W. R. Light & Son, of 445, Commercial-road, Portsmouth, and the architect is Mr. A. H. Bone, of Cambridge Junction, Portsmouth.

SCHOOLS, TROON, N.B.—A large school is in course of erection in Brasse-street, Troon. The building, which is to be of red sandstone from Ballochmyle Quarry, Mauchline, will accommodate 550 pupils. The following are the contractors for the work:—Watson & Adams, Troon, digger, mason, and brick-work; John Templeton & Co., Troon, carpenter and joiner work; David Walker, Troon, plumber and gasfitter work; Thomas Hall & Son, Irvine, slater work; Archibald M'Skimming & Son, Troon, plaster and cement work. The estimates accepted amount to about 5,000. The architect is Mr. R. S. Ingram, of Kilmarnock.

RESTORATION OF ABBOT REGINALD'S GATEWAY, EYHAM.—Mr. R. A. Briggs, of Norfolk-street, Strand, W.C., the architect appointed by a committee to inquire into the proposed restoration of this gateway, has reported as follows:—"As arranged with the Rev. G. Napier Whittingham, I met your committee last Saturday, the 17th inst., and discussed with them the best way of treating the approach to the above gateway. Informally, before the meeting took place, I had made two suggestions as to its treatment. The first was the very simple one of excavating the ground between the walls of the gateway down to the original level of the floor, which, from the excavation that was made, I found to be about 3 ft. 2 in. In this scheme I proposed to arrange steps down from and up to the existing levels of the churchyard and passage. But at the same time, pointed out that there was a considerable disadvantage in this arrangement through the natural discomfort it would cause to persons going to and from the church. Your committee have agreed that this scheme would not be acceptable to them. The second suggestion I made was to excavate areas inside the gateway immediately next to the side walls, and to arrange a footway in the centre, with a stone balustrade. The objection to this scheme would be that rubbish would collect in the areas, and I would beg your committee's consideration on this objection. The third scheme that I would suggest, and which would be of a more elaborate and costly nature, would be to make an inclined paved footpath from the point of an existing paved crossing about fifty yards (roughly) north of the gateway, down to the original level of the gateway and up again to the porch of All Saints' Church and the Churchyard walks. This scheme is, in my opinion, the most suitable and the most artistic treatment. As the level of the original floor, as mentioned above, is about 3 ft. 2 in. below the existing level of the footway, and as the path rises about 1 ft. 3 in. from the above-mentioned crossing, there would be only a fall of 1 ft. 11 in. in the proposed new footway—a very easy gradient. Last Saturday through the courtesy of Mr. Hunt, a hole was dug at the corner of the porch of All Saints' Church, and in my opinion the original level of the threshold of this porch is 8 in. below the top of the existing step. I suggest, therefore, that the inclined way proposed to be taken down to the original level of the gateway shall therefore rise again to the level of the porch, and be continued up to the existing churchyard walks at an easy gradient. The occupants of the houses on the east side of the proposed footway would reap con-



siderable advantage if this scheme were carried out, as many of the entrance doorsteps of these houses, which are now below the level of the present pathway—causing, no doubt, great inconvenience through allowing the surface water to enter the houses and passages—would, by the proposed scheme be several inches above the footway. I should propose to put a landing with steps to the entrances of the houses situated on the west of the new proposed way, thereby again effecting an improvement to this house. The gateway, which is a very exceptional and interesting example of Norman work is, I am sorry to say, in a bad state of repair, and it is well worthy of careful restoration. Every stone that is intact should be kept and only those stones that are actually decayed should be cut out and replaced. On Saturday I noticed signs that there had originally been arches in the front and back walls. Probably in the original gateway in the Norman period there were small circular-headed arches, which at a later date were taken down, and a much larger arch built. I am of opinion that these arches should be placed in the front and back walls, and I think it would be possible to find out from records what these arches were like. This is a matter for which I should like your committee to also give its consideration. A great improvement to the general appearance of the approach would be to have the colour-wash taken off the walls and timbers of the house on the west of the footway, and to have the timber exposed.

**THEATRE, WALHAM GREEN.**—A commemoration stone was laid at the Granville Theatre of Varieties, Walham Green, on Thursday, the 1st inst. The chief portions of the structure are completed and the theatre will shortly be opened. The building is so arranged that there is no pit, the audience being supplied with a fine roomy balcony, and over this is a large gallery. The capacity is calculated at nearly 1,500 persons. The edifice is of red brick and terra-cotta, a corner being treated with towers and minarets. Over the entrances will be iron and glass shelters, fitted with painted glass. The entrances and vestibules are decorated with raised plaster, the ceilings and walls being panelled out in Louis XVI. ornamentation. This decoration is carried along the walls of the open corridor at the sides of the stalls, and is finished in blue and gold, with figure paintings in panels. Faience or Doulton ware is used for interior embellishment. Not only are the walls covered with this material, but the proscenium front, auditorium, ceiling, gallery, and balcony fronts are formed of it. Mr. C. Gray Hill is the builder, and Mr. A. Whitehead has executed the terra-cotta decoration. The architect is Mr. Frank Matcham.

**HOUSES FOR FISHERMEN, GRIMSBY.**—On the 1st inst. twenty-nine homes for fishermen were opened in Doughty-road, Grimsby. There are twenty-nine homes in two blocks, fourteen two-story and fifteen one-story houses, the former containing a living-room and kitchen on the ground floor, and on the first floor two bedrooms; while in the latter dwellings there are a living-room and a bedroom on the ground floor. The whole of the internal woodwork is stained and varnished. The floors of the living-rooms and kitchens are laid with red and black Staffordshire tiles, and the bedrooms have boarded floors. The kitchens contain Yorkshire ranges, and the bedrooms and living-rooms are registered stoves. The total amount of the contract is 5,600l. The contractors were Messrs. Hewins & Goodhand; the plumbing work has been done by Messrs. Kennington & Dolby, the smith and iron-founding by Mr. W. C. Sharpe, and the painting by Messrs. Heseltine & Speechley, while the grates have been supplied by Messrs. Goldthorpe & Shuttleworth. Mr. H. C. Scaping was the architect.

**CLUB BUILDINGS, MEXBOROUGH.**—The Constitutional Club premises, recently formed at Mexborough by extensive additions and alterations to existing buildings, were opened on the 2nd inst. The work has cost about 500l. Mr. W. Shepherd of Mexborough was the contractor; and the decorations were carried out by Mr. W. Nicholson. The architect was Mr. G. White, of the same place.

#### SANITARY AND ENGINEERING NEWS.

**SEWERAGE WORKS, HEXHAM.**—These works, which are nearly completed, are constructed on the septic system, and are built almost entirely of concrete. According to the *Newcastle Leader* they consist of a duplicate tank, each half of which is 55 ft. long and 9 ft. broad, and of six filters, each of which is 30 ft. long by 20 ft. broad. The sewage is discharged into the tank through iron traps, which are sealed to a depth of 2 ft. 6 in., thus making it impossible for the gas generated in the tank to get back into the sewer. In the tank, the sewage is submitted to the action of germs, by whose agency the whole of the solids are liquefied. The liquid then passes through outlets—also securely trapped each side of the trough in a thin film, the germs being destroyed by the action of the air. Thence the effluent passes into the filters, and is submitted to the action of other germs. The filters are worked in pairs by automatic gearing. Each works continuously for four hours and rests for twenty, so that the whole of the six filters come into use by rotation every twenty-four

hours. They are usually filled with ashes, coke breeze, and furnace clinker, but by way of experiment two of the filters at Hexham will be supplied with broken bricks instead of clinker, with the consent of the patentees of the system. In the centre of the tank there is an inspection chamber or shaft, fitted with plate-glass lights, through which the progress of decomposition may be observed. The gas generated in the tank will be used for illuminating purposes. The works are expected to be in active operation shortly, and it is believed that the sewage effluent, after treatment, will be pure enough to meet all the requirements of the Rivers Pollution Act. The plans and specifications were drawn up by Mr. R. T. Surtees, Surveyor to the Urban District Council.

**PROPOSED HARBOUR, LOWESTOFT.**—The *East Anglian Daily Times* states that with a view to avoiding, if possible, the great outlay for protection works on the Denes at Lowestoft, a suggestion, which was made some sixty years ago, has been revived at Lowestoft, namely, the making of a harbour of refuge on the Denes, and the provision of wharves, docks, warehouses, &c. Lowestoft boat owners, in common with the residents generally, have realised with serious concern the denuding of their benches, and the possible permanent flooding of the Denes. Now, after a lapse of sixty years, a suggestion has been made that the Denes belonging to the Corporation, south of the Model Yacht Pond, should be offered to a railway or other company with a view to the construction of a new harbour with docks, wharves, &c. A memorial on the subject has been prepared for presentation to the Town Council.

**GASWORKS' EXTENSION AND PRIVATE STREET IMPROVEMENTS, NELSON, LANCs.**—On the 31st ult., at Nelson, a Local Government Board inquiry was held into the application of the Nelson Town Council for sanction to a loan of 40,000l. for the purpose of gasworks' extension and of improvements to the purpose of private street improvements. It was stated by Mr. K. Prescott, the Town Clerk, that the old Local Board acquired the gas undertaking in 1866, and owing to the growing wants of the district the Brierfield Gasworks were purchased for 20,000l. in 1888. The statutory limits of supply were increased, and the Council then applied for a loan for the development of the Brierfield Gasworks, which were better situated than those at Nelson. The Chairman of the Gas Committee said that some of the money applied for had been expended, and an open borrowing clause had been obtained in respect of the gas undertaking. The annual output of gas was 190,000,000 cubic feet, as compared with 6,000,000 thirty years ago. The storage capacity was 2,500,000 cubic feet, and the price of gas was 2s. 6d. per thousand cubic feet in the borough, and 2s. 9d. outside the borough.

**PROPOSED PIER, BEXHILL.**—The pier shortly to be constructed at Bexhill is peculiar as having the pavilion at the western side of and about half-way down the pier proper. The site acquired is in the centre of the west esplanade, facing Egerton Park. The pavilion will be so arranged at the side as to be used without interference with the promenade or landing stage business of the structure. Concerts, theatricals, and musical entertainments generally, will be provided for, with seating for 1,500 persons. The pier-head beyond will provide for open-air entertainments, with 1,000 chairs, protected by glazed wind screens. The landing-stage at the pier-head will taper seaward terminating in a semi-circular dolphin, making the total length of the pier 1,315 ft. The cost is estimated at 25,000l. The engineers are Messrs. Mayoh & Haley.

**SEWERAGE WORKS, GAINFORD.**—The sewerage works at Gainford have now been completed, and were handed over to the Barnard Castle Rural District Council on the 29th ult. The settling tanks and irrigation works are situated near the river Tees, opposite Black Scar. The sewage runs by gravitation from the village to the settling tanks, where it is treated with a precipitant, and the effluent conveyed in pipes to any one of the seven irrigation beds, which together are about 1½ acres in extent, and through which it percolates and makes its way into the river Tees. The collecting tank is furnished with a siphon for discharging intermittently. Each such discharge delivers on the irrigation bed which happens to be under treatment 1,275 gallons of sewage water which has passed through the settling tanks, where it had been freed from a great part of its solid matter, into the collecting tank, where further settlement takes place, while the tank is slowly filling. In the settling tanks the usual sludge-pumps are dispensed with, and the sludge is shot out through a 9-in. valve into a sludge-pit near the settling tanks, but at a lower level, where it drains and dries ready for carting away. The cost of constructing two miles of sewers with the attendant flushing chambers, manholes, settling tanks and 2½ acres of drained and levelled irrigation beds and other works, has been 1,770l. Mr. P. O. Hetherington was the contractor, and the engineer was Mr. Robert Robinson, M.Inst.C.E., of Darlington.

**NEW LIGHTHOUSE, ST. MARY'S ISLAND, CURRY POINT, NORTHUMBERLAND.**—On Wednesday, the 31st ult., the new lighthouse erected on St. Mary's Island was opened in presence of a number of people. It was built to displace the old lighthouse

which stands on the Priory Point. Tynemouth, overlooking the entrance to the Tyne, the light of the latter being discontinued simultaneously with the illumination of its successor. The construction of the new light has occupied over two years. The buildings are of Heworth stone, and are of a most substantial character. The tower is of brick covered with cement, three quarters of a million bricks having been used in its construction. The lighthouse is circular in shape, and 120 ft. high from base to vane. The lantern is reached by a corkscrew staircase of 145 steps, and the illuminant is of the first order dioptric apparatus, with 5-wick Trinity House burner in focus, paraffin being used as the illuminant. The weight of the revolving lens is four tons, and it is floated in mercury on a supporting frame weighing seven tons. The intensity of the beam is 121,500 candles in thick weather, and 81,000 in clear weather. It gives two flashes in quick succession every twenty seconds, and is visible in clear weather at a distance of 17 miles. The contract for the lighthouse has been carried out by Mr. J. L. Miller of Tynemouth, and Messrs. J. Tweedle & Co., of Newcastle, provided the ironwork. The lantern was designed by Mr. T. Matthews, C.E., engineer-in-chief to the Board.

**BRIDGE, MILLHAR, GLASGOW.**—A memorial stone of the new bridge over the river Cart was laid on the 31st ult. The new bridge, which replaces the ancient structure which was only 12 ft. wide, is being constructed immediately to the west, and is 50 ft. in width. It is being erected at the cost (4,500l.) of the County Council of Renfrew and the Corporation of Glasgow. It is built of Locherbriggs stone, with ringheads, springers, and parapet of grey granite, and the inside arch of white rock. The waterway is 51 ft. wide, and the span of the bridge 50 ft. The abutments are to be surmounted by ornamental railings in extension of the parapet. The builders are Messrs. Morrison & Mason, Limited, of Glasgow, and Messrs. John White & James Lang, of Glasgow, are joint engineers.

#### STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW, ST. NICHOLAS' CHURCH, BLUNDELLSANDS.**—A stained glass window, in memory of Lady Mary Forwood, has recently been placed at the south-west corner of this church. The subject is Dorcas. On the left side she and her maids are engaged with the needle in the cause of charity, symbolical of the work of the late Lady Forwood. Dorcas' dress is green, whilst those of the other workers are blue and red, which, with touches of yellow and white, are clearly outlined. On the right side of the window Dorcas is seen with the result of her labours, and almost naked beggars at her feet, imploring of her garments wherewith to clothe themselves. "Give, and it shall be given unto you." Below the window is the inscription, "In loving memory of our mother, Dame Mary Eleanor Forwood, obit December 24, 1896. Age 54."

#### FOREIGN.

**FRANCE.**—Since their first failure to find an *entrepreneur* for the Paris Metropolitan Railway, the municipality have made a second attempt on a new system, by dividing the proposed line into eleven sections for which the contracts are to be let separately. The last taken up is the section between Rue de Reuilly and the Tuileries, and that between the Place Victor Hugo and the Porte Dauphine, are still going begging, and will probably have to be carried out by the municipality itself. The fine fountain by Carpeaux, in the Avenue de l'Observatoire, Paris, is undergoing extensive repairs. —M. Molniet, who had been appointed to organise the retrospective exhibitions of the art section in the 1900 Exhibition, has resigned his post. —There is talk of the sale of the fine estate of Bagatelle, in the Bois de Boulogne, where Sir Richard Wallace lived for a long time. In the event of the sale taking place, there is no doubt that the Commission des Monuments Historiques will intervene to prevent the destruction of the chateau, which is connected with many historical associations. —A committee has been formed to raise a monument in Paris to the memory of Auguste Comte. The municipality of Sens have opened a competition for the construction of a new Hôtel de Ville at an estimated cost of 600,000 francs for the building, apart from decoration and fittings. —A very large almshouse has been opened at Lillebonne, built from the plans and under the superintendence of M. Jacques Lequeux. —A monument to Marshal Lannes, otherwise known as the Duc d'Angoulême, was inaugurated last week at Montbard. M. Pierre Degré is the architect. —M. Victor Prouvé, the painter who carried out the fine decoration of the grand staircase of the Mairie of Issy-les-Moulineaux, has just completed the studies for an important decoration commissioned by the Municipality of Paris, for the Mairie of the Xth Arrondissement. —M. Puvion de Chavannes has had the misfortune to lose his wife (née Princess Marie Cantacuzene), who has been long ill. The death is announced of M. Lanier, and that of M. Lucet, architects, both of Paris.



**NEW SOUTH WALES.**—The last Report of the Public Works Department of New South Wales, recently issued, reports the public works for the year ending June 30, 1897; the report is dated 1898. In the department of railway and tramway construction four short lines, of a total length of about 100 miles, have been completed and opened for traffic. Three of these are lines of the "pioneer" class, and are intended to afford railway communication in those tracts of level country where the amount of traffic procurable is not sufficient to justify the heavy expenditure entailed by the construction of a thoroughly equipped railway. They have been designed and carried out in the most economical manner, with the result that the average cost per mile was only about 2,028*l.*, being some 1,700*l.* per mile less than the cost of the cheapest "light line"—namely, Nyngan to Cobarr—hitherto constructed in the colony. It is added that the benefits accruing to the country from these lines have surpassed all anticipations. A short extension designed to connect Darling Island with the Darling Harbour Line was commenced towards the end of the year. In order to meet the ever-growing demand for wharf accommodation in the Port of Sydney, it was decided to utilise the extensive and valuable water frontage of Darling Island, and it thus became necessary to connect it with the Darling Harbour Line. The extension will consist of a double line of railway, and a contract for the formation of the first length of twenty-one chains is now in progress. The construction of two other lines has been authorised by Parliament, viz., Berrigan to Finley (thirteen miles), and Tamworth to Manilla (twenty-nine miles). The principle tramway in progress is the George-street and Harris-street Electric Tramway, which will consist of a double track throughout its whole length of 3 miles 20 chains. The overhead-wire system has been adopted for this tramway after a very careful examination into the merits of the various methods of electric traction in use throughout the world. Various schemes for the improvement of the entrances to the seven principal northern rivers, by means of the construction of guide-banks, training-walls, and breakwaters, have made good progress during the year, and the regular work of maintaining and improving the efficiency of Newcastle Harbour by removing reefs, dredging, reclaimations, alterations and additions to the wharves, age accommodation, &c., has been steadily pursued during the year. Extensive preparations have also been made for the construction of the Southern Breakwater and guide-wall, and a scheme for the construction of a deep-water wharf at Port Kembla has occupied a good deal of the engineers' attention during the year, the want of a sheltered coast harbour where vessels might safely load and unload in all states of the weather having long been held to be a serious obstacle to the development of the coal trade and commerce of the Illawarra district, and the general consensus of opinion pointed to Port Kembla as the most suitable and convenient site for the construction of such a harbour. For Metropolitan water supply construction, a new high-level covered reservoir, capable of holding 17,000,000 gallons of water, is being constructed on a site in Centennial Park. It will occupy an area of about 3½ acres, will be oval in form, and a special feature in its design will be a groined coke-concrete roof. During the year water supply works were completed for the towns of Armidale and Parkes, and the construction of water supply works for Tamworth was in progress. These are all gravitation schemes. During the year 124 new bridges (including fifty-three renewals) were completed and opened for traffic, aggregating 13,483 ft. in length, and consisting of 357 plain timber beam spans, twenty timber truss spans, one steel lift span, and four masonry and brick arch spans. With the exception of the steel lift span at Swan Hill and the three steel spans at Wallis Creek, Maitland, all these bridges are constructed of timber, though in many cases iron or concrete piers and abutments have been used. In the Government Architect's branch the expenditure for the year reached the amount of 250,152*l.* 6s. 3d. The new buildings completed during the year comprised four post and telegraph offices, three district lands offices, six court-houses, five police stations, and six lock-ups. The Paramatta Court-house, of which a view is given, is a building with a good deal of picturesque character. The preparation of designs and plans for the proposed new Houses of Parliament for the colony has, during the year, occupied much of the time and close personal attention of the Government Architect, and a special staff of assistants. The inadequacy of the present building has long been admitted. So far back as 1860 competitive designs for new Houses of Parliament were invited by the Government of the day, but no use was made of those received. The designs and plans submitted by Mr. Vernon, the Government architect, for consideration by the Parliamentary Standing Committee on Public Works provided for a council chamber with accommodation for eighty members or more, and an assembly chamber for 182 members, with a capacity for increase of accommodation suitable for 294 members. At the request of the Committee, Mr. Vernon prepared two additional designs, one for altering and improving the accommodation in the present building, at a cost of from 10,000*l.* to

15,000*l.*, and the other for a new building which should be erected for about 250,000*l.* Since the close of the year under review the Committee has recommended the adoption of the scheme submitted by Mr. Vernon providing for alterations to the present building at a cost not exceeding 15,000*l.* In the opinion of the Committee, the existing building, with the proposed alterations, should suffice for the business of Parliament for many years to come, and, therefore, the erection of new Houses of Parliament may be deferred.

#### MISCELLANEOUS.

**NATIONAL REGISTRATION OF PLUMBERS.**—A public meeting will be held in the Mayor's Parlour, Manchester, on the 19th inst., at which the Lord Mayor will distribute the prizes, certificates, and bronze medal of the Plumbers' Company, awarded in connexion with the recent Exhibition of Plumbers' Work at Manchester. The programme will include a lecture on "The Registration of Plumbers and Domestic Sanitation," by Dr. Mansel-Pleydell, of London.

**PUBLIC BATHS, BANBURY.**—A Local Government Board enquiry was held at the Town Hall, Banbury, on the 1st inst., respecting the application of the Town Council for sanction to borrow 1,000*l.* for the improvement of the baths. There was no opposition to the scheme. The population of the borough in 1891 was stated to be 12,768, the present estimated population being 13,000. The annual assessable value was 45,808*l.*, and the amount of outstanding loans was 22,374*l.* The number of houses in the borough was 3,100, and the acreage 4,634 acres. The period for which the loan was asked was thirty years. On the dissolution of the late Board of Health in 1889 the borough was made coterminous with the district. The Borough Surveyor explained the plans as prepared by him, and the Inspector made one or two suggestions for the improvement of the scheme.

**INDUSTRIABLE COMBINATION WASHERS.**—These washers, manufactured by Messrs. Peters, Bartsch & Co., consist of rings of soft metal grooved outside, and holding in the groove packing material, such as asbestos, rubber, hemp, &c. The soft metal, in conjunction with the packing, is intended to accommodate itself regularly to any unevenness in unplanned flanges, while the rings protect the packing material against injury from the action or pressure of steam. We have had no experience of the washer in actual wear, but it seems calculated to be both efficient and durable.

**PUBLIC WORKS, WALLSEND.**—A Local Government Board enquiry was held at Wallsend on the 2nd inst., respecting an application made by the Urban District Council to borrow about 5,000*l.* for the formation of a new road and quay on the east side of the township, 3,885*l.* for works of public and private street improvements, and 5,000*l.* for the purpose of public walks and pleasure grounds. The Clerk of the Council said that the reason the Council had resolved to take steps to put the improvements named into effect was due exclusively to the extraordinary development of the town, consequent upon the shipbuilding and engineering industries, and the recent re-opening of the coal-fields in the immediate neighbourhood. No less than 48,000 tons of shipping had been set afloat in 1897 by the firm of Messrs. C. S. Swan & Hunter, or about one-fourth of the shipping launched on the Tyne that year. The population in 1861 was 2,371; in 1871, 4,159; in 1881, 6,159; and in 1891, 11,020. The present population is 15,192. No fewer than 425 houses were at the moment in course of erection, 375 of which were on the flat principle. The immense rush of working men to the district necessitated enlarged household accommodation, the buildings at present in course of erection being sufficient to house some 2,000 workmen and their families.

**PROPOSED ELECTRIC LIGHTING WORKS, REDDITCH.**—On Wednesday, the 31st ult., a Local Government Board enquiry was held at the District Council Offices into the proposal of the Council to borrow 14,200*l.* for the purposes of the recently-adopted electric lighting scheme and other public improvements, including 11,000*l.* electric lighting, 700*l.* for street improvements, and 2,500*l.* for purchasing land for electric-lighting works and other purposes. It was stated that the annual assessable value of the urban sanitary district was 31,153*l.*; the outstanding loans under the Sanitary Acts, 13,111*l.* 8s. 5d.; the number of houses, approximately, 3,000. The population at the last census was 11,295, and the estimated population now was 14,500.

**STATUES, NATIONAL PORTRAIT GALLERY, EDINBURGH.**—The *Scotsman* states that three additional niches on the façade of the Portrait Gallery, Queen-street, have been filled with statues, to be followed soon by three more. The first of those placed represents James I. of Scotland, called the Poet King. The attitude and accessories suggest the poet, while the robes and sword indicate a knightly personage. The second statue is that of Napier of Merchiston, the inventor of logarithms. The attitude of the figure is suggestive of deep meditation, and the costume is the picturesque long-sleeved, fur-lined mantle, doublet, and trunk-hose worn by men of learning of his time. Both of these statues

are from the studio of Mr. D. W. Stevenson, R.S.A., who followed in the portrait of the king a likeness believed to be contemporary and authentic; while that of Napier was chiefly taken from the painting in the possession of Lord Napier of Ettrick. The third figure represents Alexander III. It is from the studio of Mr. W. Grant Stevenson, R.S.A., and, like the others, is 7 ft. in height. The king is represented in the costume of the period, as shown on the State seal, standing firmly on the right leg, with the left advanced. The arms, crossing the body, grasp the sceptre, whilst the cloak is thrown back over the shoulders. Below the figures the corbels have been carved with appropriate coats of arms, and the Board of Manufacturers have been experimenting to see the effect on the building of the names of the personages celebrated being emblazoned in gold on a band underneath them. Colour, it is also understood, will also be employed in a like experiment on the coats of arms. The three statues just described have been placed in niches at the east end of the building.

**PUBLIC WORKS, BARRY, GLAM.**—A Local Government Board enquiry was held on Friday, the 2nd inst., at Barry Dock, into applications made by the Barry Urban District Council for power to borrow 250*l.* for new works of street improvements, 450*l.* for works of water supply, 100*l.* for the erection of sewer gas destructors, 3,751*l.* for works of private improvement, and 8,000*l.* for providing a refuse destructor in Barry-road, Cadocton. It was stated that the refuse of the district at present amounted to about twenty-two tons per day. The destructor will have a chimney 150 ft. high. The structure will be provided with two cells of fifteen tons each, so that the proposed destructor will have a converting capacity of 30 tons per diem.

**ELECTRIC LIGHTING, LEYTON.**—A Local Government Board enquiry was recently held at the Town Hall, Leyton, into the application of the Urban Council for sanction to borrow 5,000*l.* for electric lighting and 1,050*l.* for works of private street improvement, 680*l.* for works of sewerage, and 110*l.* for the provision of a public convenience at the junction of Woodhouse- and Harrow-roads. The Clerk of the Council explained that the loans already sanctioned for electric lighting were 33,160*l.*, the amount borrowed was 32,860*l.*, and the amount expended was 29,480*l.* The 5,000*l.* now asked for was for another extension of the works.

**BUILDING TRADES IN NORTH STAFFORDSHIRE.**—The building trade in North Staffordshire still remains in a fairly prosperous condition, and from all towns comes the report that the operatives are well employed. There is a slight falling off, however, at the northern end of the district, but this up to the present has not affected the operatives. Bricklayers are working full time, with none out of employment. Joiners are busy. Stone-masons in all yards are well employed. Plasterers keep busy. Painters and plumbers are moderately employed. In the brick and tile yards throughout the district the operatives are busy. At Leek all branches of the trade are busy, and in some cases there is a scarcity of men. At Crewe good trade is still reported from all branches. At Stafford business is reported as falling off, several large jobs having been completed, and there are a few men out in most branches. At Chesley there has been a great impetus given to the trade of late, and there are more general buildings in course of erection than for years past. All classes of operatives are well employed, and there are none out of work.—*Staffordshire Sentinel*.

#### CAPITAL AND LABOUR.

**STRIKE AND LOCK-OUT AT ABERDEENSHIRE GRANITE QUARRIES.**—The labourers at Dancing Cairns and Slatie quarries have struck for a rise of a penny an hour in wages. This being refused, the drillers came out in sympathy, and about 140 men, including sett-makers, are now idle. Notices of a general lock-out have been given at other quarries, which, if carried out, will cause a suspension of building in Aberdeen, as well as of the export trade.

**STRIKE OF MASONS, BARRY, GLAM.**—The *Western Mail* remarks that a number of stonemasons have come out on strike at Barry Dock. It appears that non-society men are employed on different works in the town, and this the society hands have not been slow to resent. On Thursday, the 1st inst., the society men in the employment of Messrs. Rendell & Molton on certain new road works in the town gave notice that unless the "free" hands were taken off the job forthwith they would come out on strike. The request was not complied with, and the society men consequently came out. The difficulty is likely to spread unless the objection is removed, especially as the rules of the Stonemasons' Society distinctly specify that no member of the society can work with a non-society man.

#### LEGAL.

##### A BUILDING DISPUTE SETTLED.

THE case of Webster v. Raphael Tuck & Sons, Limited, again came before Mr. Justice Phillimore, sitting as Vacation Judge, on the 7th inst., on the application of the plaintiff to restrain the erection of buildings, &c.



22,314.—KITCHEN RANGES, &c.: *E. Gleeson*.—To raise the fire closer up beneath the cooking utensils, the



**HASTINGS.**—For additions, sanitary works, levelling playgrounds, and other works at Sandown Schools, Old London-road. Mr. Arthur Wells, architect, Queen's chambers, Hastings.—

J. Lester.....	£2,297	o	Pedgham & Hutchinson.....	£2,130	o
F. G. Hatton.....	2,250	10	D. Snow, Hastings.....	1,800	o
A. H. White.....	2,150	o			

\* Accepted.



Secretary.—**E. J. COLEBY, Esq., 148, Gresham House, Old Broad-street, E.C.**



# The Builder.

VOL. LXXV. No. 2928.

SEPTEMBER 27, 1898.

## ILLUSTRATIONS.

Proposed Church of English Martyrs, York. —Messrs. Goldie, Child, & Goldie, architects .....	Double-Page Ink-Photo.
Illustrations of Hamburg Town Hall.—Herr Grotjan, architect .....	Double-Page Ink-Photo.
Palace Gate House, Kensington, Exterior View and View of Drawing-room.—Mr. C. J. H. Cooper, architect .....	Double-Page Ink-Photo.
Constructional Details of Keltney Burn Bridge .....	Double-Page Photo-Litho.

## Blocks in Text.

Oak Chest: Late XVth Century .....	Page 245	Proposed Church of the Holy Martyrs.—Plan .....	Page 251
Panel, Musée des Arts Décoratifs, Paris. Late XVIIIth Century ..	243	Bridge over Keltney Burn, near Aberfeldy .....	251
Country House at Sutton .....	249	Premises, 166, Buchanan-street, Glasgow .....	253

## CONTENTS.

Examples of French Woodcarving .....	247	Hamburg Town Hall .....	249	Stained Glass and Decoration .....	255
The Chemical Examination of Mortar .....	244	Palace Gate House, Kensington Gore .....	250	Foreign .....	256
Notes .....	245	Bridge over the Keltney Burn .....	250	Miscellaneous .....	256
Michelangelo .....	246	The British Association .....	251	Legal .....	256
Archæological Societies .....	246	Premises, 166, Buchanan-street, Glasgow .....	253	Meetings .....	257
Country House, Sutton .....	249	Books Received .....	254	Recent Patents .....	257
Competitions .....	246	The Students' Column: Sound, Light, and Heat.—XII. ....	254	Some Recent Sales of Property .....	257
Architectural Societies .....	249	General Building News .....	254	Prices' Current .....	259
Proposed Church of English Martyrs, York .....	249	Sanitary and Engineering News .....	255	Tenders .....	259

### Examples of French Woodcarving.



WOODCARVING, and the objects on which woodcarving is bestowed, form a kind of link between purely architectural detail and purely decorative or ornamental work. In the stalls of a cathedral or church it becomes almost a portion of the architecture of the interior; in fact takes on itself, very often, an elaborate mimicry of built-up architectural forms; or, if introduced in the roof timbers, it becomes an integral portion of the structure. On the other hand, it may appear merely as surface ornament on the panel of a box or casket, having no relation with architectural forms beyond the fact of being framed within a panel moulding. A material with a fibre running one way, moreover, has its own practical limitations in regard to working; there are many forms suitable for carving in stone which are not suitable for wood, though they are often imitated in that material. So that the consideration of examples of wood carving often raises questions both of an æsthetic and practical nature.

The study of old examples shows a great deal of this kind of cross-purpose in carved work. In the present day there is rather more of a settled feeling in favour of treating woodwork in a special manner suitable to the material. In looking over old examples we find, especially during the late Mediæval period, a considerable amount of carved woodwork imitating stone architectural forms. In the great age of stone-built architecture the forms of that architecture had so taken possession of men's minds that they seemed to pervade everything; silver-gilt shrines and wooden screens alike had their buttresses and pinnacles. And in the first fervour of the Renaissance the columnar order also, like the buttress before it, would be everywhere, and intruded itself

into woodwork where it had no right place. As the overpowering influence of architecture, Gothic or Classic declined, we find in the later days of the Renaissance that woodcarving freed itself much more from architectural precedents, and developed a purely decorative treatment of its own.

This is perhaps especially exemplified in the case of French woodcarving, where the architectural forms are remarkably prevalent in the Mediæval work, and remarkably absent, by comparison, in the late Renaissance work. For other reasons French woodcarving is of special interest. It presents, taken all round, the finest collection of European work of that kind; and in that of the Renaissance period there is an interesting mingling of a distinctly French taste, which was never lost, and which asserted itself most strongly in the later Renaissance period, combining with the results of Italian influence.

The collection of a large portfolio of photographic reproductions of French woodcarving in our national museums, edited by the Manager of the School of Art Woodcarving at South Kensington,\* affords not only a valuable repertory of examples to stimulate the taste and ambition of the artisan, but also a very agreeable means of studying and comparing a number of fine and interesting examples, in illustrations which are so effective and on so large a scale as to make the best possible substitute, at all events, for the study of the actual works. Even the grain of the wood, in many of the plates, is quite clearly reproduced; and in a good many of the plates full-size profiles of the moulded portions are added. Altogether the portfolio is one of the finest illustrative publications of woodcarving which has been produced.

These examples are chiefly taken from the collection of French woodwork purchased by the South Kensington authorities in 1895, and now divided among our various national

\* "French Woodcarvings from the National Museums: Printed in Collotype from Photographs specially taken. Edited by Eleanor Rowe, Manager of the School of Art Woodcarving, South Kensington. First, Second, and Third Series. London: B. T. Batsford; 1896-1897.

museums. The three series comprise (1) work of the late fifteenth and early sixteenth century, (2) work of the sixteenth century, and (3) work of the seventeenth and eighteenth centuries. The classification according to date has been no easy matter. On the advice of several French experts, the Editor determined, in a general way, to divide each century into "early," "middle," and "late," and "when a king's name is mentioned it is to suggest that the design and carving are typical of the style prevailing during his reign, rather than to assert that the work was actually carried out during his lifetime." In treating of the later Renaissance it is still more difficult to set up exact landmarks, and Miss Rowe quotes from an article in the "Dictionary of Architecture" to the effect that the only logical thing to do is to subdivide the reign of Louis XIV. into six periods, that of Louis XV. into eight, and that of Louis XVI. into three, and call each after the artist or person whose name was paramount. The South Kensington authorities must have found the same difficulty; they have ignored it, in the case of one group in their collection, by the comprehensive phrase "latter half of sixteenth century;" but at this moment there is standing in the furniture gallery a cupboard door panel carved with a festoon of delicate foliage, immediately over a boldly designed coffer front (splendidly illustrated in No. XXIII. of Miss Rowe's plates) of great breadth of style—large surfaces, bold sweeps of line—which looks as if it belonged actually to a different century from the door above it; but both are labelled "early sixteenth century." It seems impossible to assign these two pieces of work to anything near the same period. Have the Museum people made a mistake in their dating of the first-named specimen? It looks rather as if that were the real solution.

The first example in the First Series, an oak coffer of the fifteenth century, the original of which is in the Dublin Museum, is from Northern France, and is noteworthy as exhibiting a much less architectural and a much more characteristically "wooden"

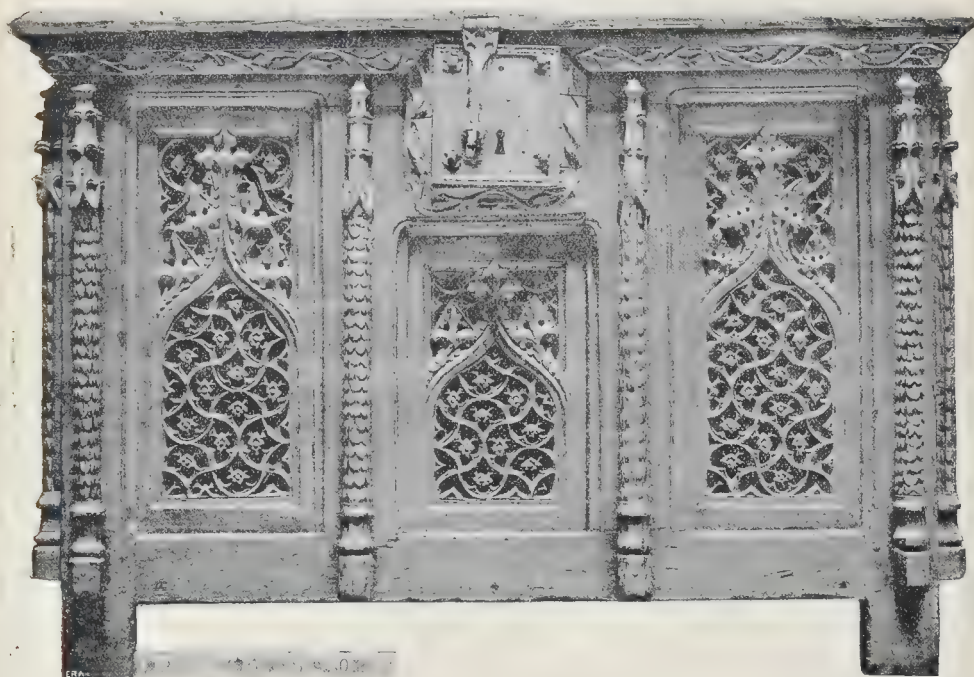


Fig. 1.—Oak Chest: Late XVth Century.

treatment than most of the Gothic examples. The carving is disposed in simple panels hardly even defined by moulding, and the larger portion of it consists of a carved thistle ornament treated with much vigour. Possibly its neighbourhood may have something to do with its greater simplicity of style and treatment. At all events one cannot help being struck by a similar contrast among the later French work at South Kensington. Alongside of one or two highly elaborated late sixteenth-century cabinets with a good deal of architectural detail, is an example from Normandy, of the same date and the same general type of design, but curiously coarse and thick in detail compared with the more central work of the same date. To return to the portfolio; we find several plates of objects in which carved tracery, of exactly the same type as the stone tracery of the period, forms the principal source of effect; a kind of ornament certainly not specially suited to woodwork. Plate VII. contains the remarkable chest of which we give a reduced copy in fig. 1. Here again we find tracery, of the Flamboyant type, to which a curiously oriental effect is imparted by the small flower ornaments which stand free within the compartments of the tracery; and here we find the application of the buttress or pinnacle, but not in its usual architectural form; no cut-out set-offs are introduced, but the buttress takes the form of a kind of attached colonnette with a surface decoration. Miss Rowe quotes Mr. Pollen's remark on this example (which is in the South Kensington Museum) to the effect that "the little buttresses are scaled in the fashion of the fifteenth century woodwork, when tile-coverings or any sort of decorative articulation that enriched the surface of

woodwork were adopted as ornaments." This view would connect the ornament of the buttresses directly with architectural detail; but we doubt if this is the case; it seems a natural manner of decorating a colonnette of this kind. We do not quite understand the editor's remark, "the crockets in this spring from the outer moulding of the arch, which dies into the margin. The effect of this is very good, as it avoids carrying the hollow moulding round the panel." There is nothing unusual in the manner of springing of the crockets; and the hollow moulding is carried round the panel, though interrupted by the springing of the arch. The next plate (VIII.) again impresses one with the difference in the character of Northern French work of this class; in general aspect the design looks a great deal earlier than the last named; the arches of the compartments are round, or rather segmental, and the colonnettes chevroned and otherwise ornamented in quite a Norman manner; the Flamboyant character of the tracery between them, however, fixes the late date. Several other traceried examples follow, and then a German one (why introduced here we know not), a cupboard door of oak, in which the exceedingly free and bold treatment of the ornament, founded on floral forms but very highly conventionalised, is an example of purely wood character of work, and certainly throws into the shade all the French traceried patterns in the other examples. Some early sixteenth-century examples at the close of the First Series are very interesting as showing us the early form of French Renaissance floral detail, graceful and symmetrical in line, yet far more free and much nearer to natural forms than the later Renaissance examples.

With the Second Series we come into the

Francis I. period, with its favourite scrollwork in panels, of which the first example, Plate XIX. is a singularly interesting and beautiful one, in which the whole surface is covered with freely-flowing spiral stems with leaves springing from them; a defect in it, however, is that the leaves are somewhat too naturalistic for the conventionalised curving of the stem lines, though the general effect is so very graceful. Miss Rowe calls attention to the treatment of the spiral stem lines, "which in the hands of the unskilled are apt to look hard and stringy, instead of being graceful lines giving strength and continuity to the design. The most satisfactory treatment is to outline the spiral with a fluter or veiner, using the sides of the tool to cant the edges. The spiral then seems to blend with the background, and has not that detached look which is so often noticeable when the edges are cut down vertically." This is a good point; the effect of a spiral stem seeming to blend with the ground is far more delicate than one which, as far as its section is concerned, might be only cut out and *appliqué*.

In this Second Series we find (in accordance with what has already been observed as to the earlier Renaissance period) the influence of architectural forms still very strong. There is a notable example of this in the fine railing given in Plate XXII., and at present in the furniture gallery at South Kensington; yet, except in the fact of the arches at the top from one baluster to another (always a bad and false form in woodwork), and the small classic capitals from which they spring, there is no direct imitation of stone architectural features; the balusters, charmingly designed and full of graceful detail, look like the general idea of the stone baluster lengthened out into suit-





Fig. 2.—Panel, Musée des Arts Decoratifs, Paris. Late XVIIIth Century.

able proportions for wood, and forming in that respect a very good example of the modification of design to suit the material. On one section of the baluster, nearly half way up, an ornament of masks in low relief is carved, differing in each baluster; a nice point in this bit of detail is that while the balusters are round in section, the masks are not carved so as to look symmetrically outward and inward and to right and left, but *three* masks occupy the circumference, so that they face unevenly to the eye; a pretty point in the design. The designs of the middle of the sixteenth century include a great deal of the kind of ornament called strap-work, which when introduced into England became so prominent a feature in Elizabethan detail. In regard to this class of work we may quote Miss Rowe's remark as to the superior delicacy of the French work:—

"In this simple style of carving the charm of the old over the modern work is, first, that the pattern is in very low relief, generally being under one-eighth of an inch; and from this it may be assumed that the greater the relief the greater the amount of modelling required; second, that where the pattern is not modelled, or only very slightly, the ground spaces are small and the pattern and the margin are generally united. In England these points were not always observed, and consequently the work is often very crude."

We quite concur in the opinion in a general way, though we may point out that in the examples given in the portfolio only one of the strap-work patterns, as far as we observed, is connected with the margin: but it is certainly better so. In regard to the example of a cabinet, Plates XXIII. and XXIV., where one piece of wood is planted on another to make a greater projection of moulding, we are glad to observe that the editor warns the student that, though this may be legitimate in some cases, "for furniture, or anything else that has to stand the wear and tear of daily use, it is a very great mistake." In fact, this is one of the worst forms of the mistake of applying to wooden furniture a system of construction properly belonging to stone architecture.

Whatever may be thought as to the artistic vices of the Louis Quatorze and Louis Quinze periods, it must be admitted that the artists of those days invented a style of detail of their own, often very effective and beautifully executed, and that they shook themselves free from the tyranny of architectural detail and treated their carved wood-work as carved ornament simply, and not as imitated construction. The second plate of the series, Plate XXXVIII., certainly shows us two sets of balusters in which architectural features are misapplied; the column forms used for the upper portion of the baluster are too thin in proportion for their situation, and the treatment of the lower portion, though pretty, is weak and wanting in breadth; these, in short, are poor designs, and might better have been omitted as far as the student is concerned, for he will learn nothing from them. But in the remainder of the plates we are almost entirely rid of imitation architectural detail; and if the ornament is not of the purest in taste, it is impossible to deny its grace and piquancy, and in some cases its great force and vigour, as in the Louis Quatorze candelabrum shown in Plate XLI., which may indeed be said to be tawdry in style, but of which the vigour and *verve* (the French word seems best to define the French

character in the work) are undeniable. As an example of the art of this period and of the illustrations of the Third Series of Miss Rowe's Portfolio we give (Fig. 2) a reduced reproduction of the panel shown in the concluding plate (LIV.), now in the Musée des Arts Decoratifs at Paris, and of which the editor truly says that a finer example could not be found of Louis Seize work, as regards design, mouldings, and execution. It is a meretricious style in itself, no doubt, and it contains the mischievous error of uniting conventional and naturalistic foliage in the same design; but with all these faults what a grace and spirit there is about it, and how thoroughly it is wood-carving work, and not anything else. It is the pretty superficial art of a superficial age, and one would not wish to revive it; but it is certainly charming within its limits, and the work of an artist who was doing his best.

#### THE CHEMICAL EXAMINATION OF MORTAR.

By H. F. HILLS, F.C.S.

IN 1892 Mr. J. Hughes contributed two papers to *The Builder* upon "The Composition of Ancient Mortars," in which he gave analyses of a number of mortars taken from various churches, castles, and abbeys of the British Isles. One of the papers concludes with the following important statement: "The higher the proportion of amorphous or gelatinous silica soluble in alkali, the better (is) the quality of the mortar, and, as this kind of silica is associated originally with the lime rather than with the sand, it becomes of the greatest importance that the character and composition of the lime intended to be used should be fully inquired into; and the best possible quality in the neighbourhood always selected by the architect and used by the builder." The details relating to the estimation of this "soluble silica" were given in the paper referred to, a 10 per cent. solution of caustic soda being used as the solvent.

Upon applying the process described to some samples of old mortar taken from Bow Church in East London, and adhering strictly to the details enumerated, very satisfactory and concordant results were obtained. The sample of Bow Church mortar taken for analysis was from a joint in the chancel wall, and is believed to have been made when the wall was first erected in A.D. 1480-1490. The joint was in too good a condition to justify penetrating into it to any great depth, but the extreme exterior surface was avoided, as it might be contaminated with soot and residues from the evaporation of rain-water solutions of the surrounding stone (Kentish rag). The mortar was hard, compact, and in excellent condition.

Comparing the analysis of this mortar with Mr. Hughes' analyses, it is found that Corfe Castle possesses the mortar which most nearly approaches it in composition, thus:—

	Bow Church.	Corfe Castle.
Probable date of erection about A.D.	1480-1490.	1090
Water (lost at 212° deg. F.)	4.48	2.42
Water of combination	3.30	4.02
Lime	20.55	31.05
Magnesia	31	28
Potash	—	20
Soda	—	15
Oxide of iron	4.00	95
Alumina	15	15
Sulphuric anhydride	4.86	26

	Bow Church.	Corfe Castle.
Carbon dioxide	18.47	22.86
Chlorine	—	.65
Gelatinous silica, soluble in alkali	8.37	7.50
Insoluble matters (sand)	29.28	29.51
Other matter and loss	.38	—
	100.00	100.00

According to Mr. Hughes, the mortar of Corfe Castle is one of the best mortars examined by him, but the above analysis shows that Bow Church mortar is of an equally good quality. It is remarkable that Mr. Hughes did not find as much as 1.5 per cent. of sulphuric anhydride in any of the ancient mortars, whereas Bow Church mortar contained 4.86 per cent. This may have been present in the lime originally used, or partly present in the water used for mixing the mortar, or it may have been absorbed from the atmosphere through the agency of rain water. The sand when separated from the calcareous portion of the mortar appeared to be of good quality, the grains being irregular in size, and for the most part having sharp edges.

It must be remembered that most of the carbon dioxide, the combined water, and possibly of the sulphuric anhydride has been absorbed since the lime and sand were mixed. Deducting these three constituents, and calculating the percentage proportions of the remaining compounds, the analysis appears thus:—

	Bow Church Mortar (on quicklime basis).
Moisture	6.10
Insoluble silicious matter	39.91
Silica, soluble in alkali	11.41
Lime	36.19
Magnesia	0.42
Oxides of iron and alumina	5.45
Other matter and loss	.52
	100.00

The insoluble silicious matter was found upon analysis to yield 91.64 per cent. silica and 7.85 per cent. of oxides of iron and alumina.

As the mortar was used between Kentish ragstones, the following remarks from Whicford's "Observations on Kentish Ragstone" are of interest:—

"The durability of buildings erected with ragstone depends mainly upon the qualities of the lime from which the mortar is made. The durability of ragstone wall work can only be depended upon when executed with mortar made with lime burnt from the ragstone itself; this mortar becomes in the lapse of time so very hard as to form almost one and the same body with the stone."

It is impossible to say whether the lime used in this case was made from the ragstone itself, but if the amount of "soluble silica" present in lime made from Kentish rag were determined, it would afford some indication as to the probability of such being the case.\*

The proportions of sand and lime used were probably (roughly) one of sand to one of lime.

The next sample examined was some mortar or grout (believed to be about 150 years old) taken from a position about midway between the internal and external faces

\* Since writing the above, a piece of the stone from the same position in the chancel wall has been examined for "soluble silica" in the stone itself, and also in the quicklime obtained by calcining the stone. It was found that conversion into quicklime did not materially affect the soluble silica. The figures obtained were:—

	In stone	In quicklime
	Per cent.	Per cent.
Total silicious matter	7.25	12.20
Silica soluble in 10 per cent. NaOH	3.65	6.09
Insoluble silicious residue	3.60	6.01



of the external wall of the north aisle, and about 2½ ft. above the ground level. This wall had a total thickness of about 22 in.

This mortar contained numerous gravel pebbles varying in size from about 1 in. along their longest edge to particles little larger than sand-grains. The pebbles were regular in shape and water-worn. Upon grinding down the mortar and picking out the pebbles by hand, these latter were found to amount to about 20 per cent. of the total weight of the mortar.

The mortar could easily be broken up and crumbled in the hands. It possessed a peculiar musty odour. When heated, a disagreeable odour of burning organic matter was evolved, and the substance darkened for a moment, owing, no doubt, to the liberation of free carbon. Very rapidly, however, the carbon vanished, leaving a greyish-white residue, which was devoid of odour. Even upon mixing the residue with water it evolved no odour beyond that usually obtained upon mixing lime with water.

The analysis of this mortar is shown in the following columns, the composition being calculated from the original analysis to what it would have been before the lime absorbed carbon dioxide from the atmosphere. Taking the figures of the last column, it will be seen that the mortar consisted of a mixture of gravel and lime in the proportion of about three of gravel to one of quicklime. The percentage of "soluble silica" is, as might be expected, by no means high. The amount of sulphuric anhydride is high, as compared with Mr. Hughes' analyses, but it approximates very closely to the amount found in the old mortar from the chance wall.

Analysis of Grout or Mortar from Interior of Aisle Wall.

	Analysis after Grinding Pebbles.	On Quicklime Basis deducting CO <sub>2</sub> and Combined Water.	Analysis in- cluding Pebbles.	On Quicklime Basis deducting CO <sub>2</sub> and Combined Water.
Moisture (lost at 212°F)	1.58	1.92	1.26	1.47
Water of combination and organic matter .....	6.03	—	4.82	—
Gravel pebbles .....	—	—	20.00	23.35
Other insoluble silicious matter .....	50.85	61.97	40.68	47.50
Silica, soluble in 10 per cent. Na OH .....	2.00	2.44	1.61	1.87
Lime .....	18.95	23.09	15.10	17.70
Carbon dioxide .....	11.91	—	9.53	—
Oxides of iron and alumina .....	2.50	3.05	2.30	2.73
Sulphuric anhydride .....	5.29	6.45	4.23	4.94
Magnesia, &c., and loss	.89	1.08	.72	.84
	103.00	100.00	100.00	100.00

† Equivalent to 57.07 per cent. carbonate of lime (Ca CO<sub>3</sub>).

\* Equivalent to 21.65 per cent. carbonate of lime (Ca CO<sub>3</sub>).

It was suggested that loam had been used in the mortar, but the following analysis of the insoluble silicious matter (excluding pebbles) shows that it was evidently ordinary gravel and not loam that was employed. Had loam been used the percentage of alumina in the silicious matter would have been higher.

	Insoluble Silicious Matter per cent.	Loam (Abney) per cent.
Silica .....	61.21	60.7
Alumina .....	2.85	27.0
Oxide of iron .....	—	1.3
Carbonate of lime .....	—	0.5
Organic matter .....	—	5.0
	66.06	100.5

H. F. H.

## NOTES.

IN February last the London County Council instituted what promises to be a most searching and valuable inquiry into the purification of sewage by filtration. It is being carried out by Dr. Frank Clowes, chemist to the Council, and Dr. A. C. Houston, who is already well known for his work in this department of science. The first report on the subject has recently been issued, and deals with the "Bacteriological examination of London crude sewage." This report contains the result of Dr. Houston's labours during a period of about two months; it will be followed in due course by one or more reports on the bacteriology of the experimental filters and of the filtrates. After describing some of the methods used in the bacteriological examination of sewage, including the search for specific micro-organisms (such as the typhoid and diphtheria bacilli, bacillus coli communis, &c.), Dr. Houston proceeds to estimate the number of bacteria, spores of bacteria, liquefying bacteria, bacilli of various kinds, and other minute organisms, in numerous samples of (1) Barking crude sewage and (2) Crossness crude sewage. The results reveal an amount of life almost inconceivable in its multitude; in one cubic centimetre of the Barking sewage upwards of 7,000,000 bacteria were found, and more than 5,000,000 were found in a sample of Crossness sewage. To find the number in a cubic inch, we must multiply these already immense numbers by (roughly-speaking) sixteen. The numbers of specific bacilli are, in comparison with these totals, very small, but, when considered positively, they are large enough to show the deadly nature of crude sewage. Photo-micrographic illustrations of the most common bacilli, &c., add considerably to the value of the report. If the rest of the inquiry is conducted as ably as this portion, it will be of great and lasting benefit to men engaged in this most important branch of sanitary science.

A FEW weeks ago Sir John Evans pointed out what would be the effect of excessive pumping from the New River Company's wells in the immediate neighbourhood of the Lea, and showed that the channels through which springs naturally rise in the bed of the river might, by excessive pumping from the underground water in the chalk, be converted into passages along which the water of the river would escape and find its way to the wells. His prophecy having to some extent been fulfilled, he has written to the *Times* about it. The immediate object of his calling attention to these matters apparently is to expose "the fallacy of the view that in the chalk of the valley of the Lea there was an unlimited supply of underground water available for use in London." We should accept the general view put forward by Sir John Evans if we thought the surface drainage of the Lea was practically the same as the underground drainage. No doubt springs coming up in the river bed, on being withdrawn, allowed the cracks which they occupied to be filled at once by the water from the river. But that does not do away with the fact that the Lea basin is a large one, and from the underground flow of water there is every reason to believe that much of it would in any case be unaffected by whatever may per-

colate from the river itself—the main body of the water being too deep-seated and too far off, besides flowing parallel with the general trend of the Lea in some cases, according to the observations of geologists. The underground water-supply resources of the Lea are by no means yet exhausted, though they must not, of course, be drawn upon indefinitely.

## Magnetic Action of Electric Railways.

THE joint discussion last Tuesday by the Mathematical and Mechanical Science Sections of the British Association on "The Magnetic and Electrolytic Actions of Electric Railways" shows clearly that scientific men are strongly of opinion that the Board of Trade regulations for electric traction are not stringent enough. Whilst every one is anxious that cheap and rapid traction facilities should be provided for the working classes, yet it is important that traction companies should not be allowed to use the earth as part of their return circuit. This would be no great hardship to them, as an insulated return can be made at very little extra expense, and in some cases would lead to more economical working. At present the return currents, as in the case of the City and South London Railway, often upset telegraphic and telephonic work, and probably are corroding gas and water mains more or less rapidly. Again, the interests of a magnetic observatory such as Kew must be protected. The magnetograph records now being taken there are continuous for forty-two years, and they show that only by continuous work for many years to come can we hope to get at the secret of the earth's magnetism. If the records are disturbed by magnetic induction from the long line of trolley wire which it is proposed to erect in its neighbourhood, no money compensation will remedy the evil, as the continuity of the observations will have been broken. The observatories at Washington and Toronto have been rendered useless as magnetic observatories by the induction effects from electric tramways, and the British Association has done well to discuss the remedies for this evil before it was too late.

THE *Times* of Tuesday contained a communication detailing the experience of a Sunderland shipbuilding firm, Messrs. Short Bros., in regard to the adoption of an eight hours' day at their works. The system has been adopted there since 1891, and the following statement from a partner of the firm is quoted:—

"Messrs. Short took up the system in the belief that they could get the same amount of work out of their employes by a better method than that which then prevailed. Of the men working on time wages 15 or 20 per cent. lost the first quarter of the day while the piecemen scarcely ever started before 8.30 under the old method. The men started at six o'clock, stopped at eight for half an hour for breakfast, had another interval of an hour at noon, and the day's work was finished at five. The conditions under which the old system was carried out were such that many workmen were physically incapable of maintaining the long hours. It was, in point of fact, then quite common for a man with 24s. a week to lose, on an average, three quarters per week, simply because he was unable to rise every morning at 6 o'clock and work full time. Under the system which then obtained in the yard, from 15 to 20 per cent. of the employes never started till after the first quarter had been lost. Under the forty-eight

hours' system, the men start—after breakfast—at 7.30, and go on with only one break until 5 o'clock, and they are able to do more work this way than under the old system, and at the same time more work is got out of the machines, the results of the eight hours' system being an increased output and a decreased cost. Under the fifty-three hours the men did not average anything like eight hours per day—indeed, some of them did not average five hours, owing to the time they lost. The men work better and more hours under the forty-eight hours' system than under the other, while the machinery is also kept running more regularly and for a greater number of hours."

This is the most favourable report of the result of the eight hours' system in a large establishment which we remember to have met with; but it must not be forgotten that the experiences of some other large employers have been entirely against it, and the result evidently depends a good deal on the special circumstances. For employers to introduce it when they find it beneficial to themselves and their workmen is quite a different matter from clamouring for legislation to compel all employers, under all circumstances, to do the same. If it is found by experience that the system of starting later and doing away with the breakfast hour works better for employers and men it will be further adopted, and Messrs. Short's report is, at all events, a valuable contribution to the evidence on the subject.

Walthamstow  
Public Baths.

We fear the history of the competition for this building affords a fresh illustration of the unfortunate laxity with which both committees and architects too often regard the question of what a building will really cost. Competition designs were invited for the building on the basis of an estimated cost of 7,000*l*. Mr. Rowland Plumbé, the assessor, selected the design of Mr. Dunford as being "the one which could be carried out at a sum nearest the limit of 7,000*l*," an expression which shows that from the first it was evident that none of the designs could have been carried out for that sum; and, according to the report in the *Essex Herald*, Mr. Dunford had himself stated that his design could not be carried out for that sum, but his statement "was kept from the Council for months." Ultimately, for reasons which do not appear, the Walthamstow District Council discarded the architect of their first choice (thereby throwing over the assessor's award), and appointed another competing firm, Messrs. Spalding & Cross, whose design they considered much superior. Messrs. Spalding & Cross, on being asked, estimated the cost of their design at from 8,000*l*. to 9,000*l*., so that they went into the competition ignoring the conditions. On tenders being obtained, however, the lowest was for 14,836*l*., which it appears has been accepted, amid a good deal of grumbling. It is evident that the Council started with a mistaken idea as to the cost of the kind of building they wanted; but having deliberately advertised for a building not to exceed 7,000*l*., the conditions should have been maintained; and the proper thing to do, when the assessor found that none of the designs could be executed for the sum proposed, was to pronounce the competition void. Furthermore, when we find an architect stating the probable cost of a building at 9,000*l*., and the lowest tender coming out at nearly 15,000*l*., we cannot but observe that any architect ought

to be able to estimate the cost of a proposed building from his own plans much nearer than that, and that his clients have very good right to complain if he does not.

**Sanitary Condition of Alnwick.** The sanitary condition of the Urban District of Alnwick, and the housing of the working classes therein, is the subject of a report to the Local Government Board by Dr. G. S. Buchanan. In Alnwick and Canongate a variety of unwholesome conditions were reported in 1849 by Mr. (Sir Robert) Rawlinson to the General Board of Health—unhealthy, damp, and overcrowded dwellings, packed away in narrow courts and alleys behind the main thoroughfares; abundance of privy and midden nuisances; unpaved or badly paved yards; no public water supply and no system of sewerage; but between 1852 and 1854 a large improvement scheme was carried out by the newly appointed Alnwick and Canongate Local Board. But it appears that at the present time a large proportion of the dwellings of the town, principally those occupied by the poorer classes, are to be found huddled on small areas at the back of the main thoroughfares. Almost always it has happened at one or another time in the history of a property that whatever open space originally belonged to it has been utilised for building. As a rule, the only windows and doors are those facing the passage or common yard. These dwellings are thus without through ventilation, and commonly they receive insufficient light. Windows are frequently small, and often can be opened only to a trifling extent. Standing on a wet soil, constructed of porous stone, and unpaved with damp-proof course, these houses are conspicuously damp. To the unhealthiness produced by crowding together of insanitary dwellings upon area are added the evils attending overcrowding of persons. Drainage appears to be fairly good. Excrement disposal is nearly always by water-closets, though these are reported to be hardly sufficient in number for the inhabitants; and the receptacles for house refuse (removed once a week by the Corporation) are unsatisfactory; they are often only old pails, broken boxes, or other makeshifts, and usually they have no cover; in consequence, before the arrival of the scavengers' cart much of the refuse may become blown about the public streets. The water supply, obtained from springs on land, three miles to the south-west of Alnwick is reported to be liable to contamination from drainage of public highways and by farm-house and cottage sewage, though recently considerable improvements have been effected. At each of the springs a chamber has been constructed with a view to excluding surface drainage, and water is carried thence to the mains in iron pipes. Additional springs have been brought within the collecting system. Such water as is not derived from springs, however, is principally contributed, as before, by drainage of agricultural land. This source of supply cannot be considered satisfactory, not only because much of the land furnishing the water is from time to time manured, but also because it is apt to fail altogether in dry seasons.

Old House  
Burned  
in Paris.

An interesting old house in the Rue de Jouy, near the Hôtel de Ville, Paris, has been destroyed by fire. The house was built from

the designs of François Mansard, towards the close of the eighteenth century, for the Duc d'Aumont. Lebrun painted in it, as a decoration, his "Apotheosis of Romulus," and the sculptor Auguier adorned the garden with a fine group of "Venus Couchée." Under the First Empire the house had been transformed into the Mairie of the district, and more recently it had become the "Pharmacie Centrale des Hôpitaux." Although the original design had suffered a good deal during the successive transformations of the building for these various purposes, it still retained a good deal of the original sculpture and decorative detail, and was regarded by French archaeologists as a building of considerable interest.

**An Exhibition of Lithography.** THE revived interest in the art of lithography is to be further illustrated by a special exhibition of lithographs at South Kensington Museum, to open on November 1, under the auspices of the Committee of Council on Education. As lithography was discovered by Senefelder in 1798, this will be a centenary exhibition. The "Department" will be assisted in the selection and arrangement of the exhibits by a committee organised by the Society of Arts. It is to be hoped that the opportunity will be taken to get a representative collection of the lithographs of Raffet and Charlet, and other eminent French lithographic artists of the earlier part of the century. A good collection of Raffet's works would in itself make the exhibition worth holding.

The Cluny  
Museum,  
Paris.

THE scheme for keeping the ground clear in front of the Cluny Museum has unfortunately fallen through. The Government and the Municipality were pretty well agreed as to the purchase of the land, but at the last moment the proprietors refused to sell it, and appear to have formed the resolution to build apartment houses on the ground on their own account. It is a pity that this could not have been prevented, as the new block will undoubtedly interfere with the effect both of the Cluny Museum and the New Sorbonne buildings.

#### MICHELANGELO.\*

By C. J. TAIT.

THE following entry occurs in the notebook of one Lodovico di Leonardo Buonarroti Simoni: "I record that on this day, March 6, 1474, a male child was born to me. I gave him the name of Michelangelo, and he was born on a Monday morning four or five hours before daybreak, and he was born while I was Podesta of Caprese, and he was born at Caprese." We learn further from Vasari that at the moment of his nativity "Mercury and Venus entered with a benign aspect into the house of Jupiter, which indicated that marvellous and extraordinary works, both of natural art and intellect were to be expected of him."

He was second in the family. His elder brother, however, we shall not hear much of. He entered the Priory of San Marco, and was lost to the world. Michelangelo thus became practically the eldest son in so far as responsibility went—responsibilities that toward his father and younger brothers he loyally fulfilled.

Six months after his birth his family removed to Settignano, a suburb of Florence, in the neighbourhood of the stone quarries, from which the city is built, and where his forebears were masons. He was put to school, where he showed himself backward, giving up all his leisure time to drawing, in which pursuit his

\* A Paper read by Mr. C. J. Tait, A.R.L.B.A., at the Easter Technical and University Extension College, June, 1897.



master secretly abetted him. After the usual reluctance exhibited by parents to abandon their children to the seductions of the arts, Michelangelo was apprenticed to Ghirlandajo, the goldsmith and painter who executed the celebrated frescos in the choir of S. Maria Novella. The apprentice soon showed great technical ability "by producing perfect copies of ancient drawings, executing the facsimiles with consummate truth of line, and then dirtying the paper so as to make it pass off as the original of some old master"—another second Chatterton, indeed.

Ghirlandajo was a foremost painter in the Florentine manner, but the precocious boy liked neither the man nor his manner. His sympathies were already engaged. "The boy, now drawing from one thing, now from another," we are told, "without fixed place or steady line of study, happened one day to be taken by Granacci (another pupil) into the garden of the Medici at San Marco, which garden the Magnificent Lorenzo—a man of the first intellectual distinction—had adorned with antique statues and other reliques of the plastic art. When Michelangelo saw these things and felt their beauty, he no longer frequented Domenico's shop, nor did he go elsewhere, but judging the Medician gardens to be the best school, spent all his time and faculties in working there." Lorenzo observed the lad's talent and took him into his household, at the same time providing some small office in the Customs for his father. The humble Lodovico asked only for this obscure post, when Lorenzo answered, with a smile, "Ah, my friend, you will never be rich." Two years after this Lorenzo died, but he had showed the lad much kindness, taking an interest in his work, and calling him up to show him any new gem or intaglio he became possessed of. Michelangelo never forgot this friendship, and it bound him to the Medician interest for his life. It was during this period that, while working in the church of the Carmine, a young braggart sculptor, Torregiano, gave him a blow that, breaking the bridge of his nose, has given us that face that we know and love so well. This Torregiano, who Cellini tells us was more of a bravo than a sculptor, came to England, and did work in Henry VIII's Chapel at Westminster. The gentleman in question afterwards came to a violent end in Spain.

The Medici household being broken up by Charles VIII.'s inroad, Michelangelo started off to Bologna. In consequence of a defective passport he was there fined 10*l.*, which an opulent Bolognese, learning that he was a sculptor, paid for him, and took him into his service. He remained more than a year, when a sentiment against alien immigrants drove him back to Florence, which was then under the rule of Savonarola. The year following he went to Rome, as the most likely field for his talents. Circumstances had mixed him up with the Cardinal di San Giorgio. While in Florence, a Roman dealer had seen a Cupid of Michel's, which he bought for 30 ducats and sold for 200 ducats to the Cardinal as an antique. The purchaser becoming suspicious of the trick, sought out the most likely sculptor, and being directed to Michelangelo, his doubts were confirmed, and the dealer was made to refund the price. This incident served as some introduction to the capital, for the Cardinal gave him small works to do, but he made a better friend in one Jacopo Gallo, for whom he executed a group of Dionysos, followed by the famous *Pieta* of the Vatican, which at once raised him to notoriety. The articles binding the sculptor to the performance of this work are still extant, setting forth the time that the work should take, viz., one year, and the amount to be paid him for the same, including the cost of the marble—in all 450 golden ducats of the Papal mint. The group represented the mother of the dead Christ supporting the body of her Son upon her knees. He had before this doubtless executed another group of the Madonna and Child which is now in Bruges. There is no clear evidence as to the date, but he writes from Rome to his father to hide and be careful of a work which was destined for some Flemish patron. This group is more simple in conception than that of the Vatican. The frame of the Madonna is not of so large a mould, nor the head so proportionally small, thereby accentuating this characteristic of build. The group is pleasing, and in contrast to the *Pieta*, which is painful.

Meanwhile the sculptor's family were giving him some trouble and anxiety. His father had

lost his berth in the Customs with the banishment of Piero. His second brother he had set up in the cloth trade, where he did but indifferently well. The next, who was but little good, he put in the same business; and the next to him, again, greatly annoyed Michel by sinking to the level, as he expresses it, of a common peasant upon his father's farm at Settignano. These four often required, and were not backward in asking assistance, which the elder son was always ready to give, although it must often have greatly reduced his slender resources. "Although as I have said," he writes, "I am out of pocket myself, I will do my best to get money. I will send you what you ask for, even should I have to sell myself into slavery."

His own habits of life were parsimonious enough. When at Bologna he slept four in a bed, himself, that is, and his three workmen. Although under such circumstances he must surely have slept less, yet under no conditions did he sleep much. Sleep, he declared, gave him pains in the head and deranged his stomach. Further, having a tendency to cramp, he always slept in his clothes, even to the tall boots which he always wore. One thinks with sympathy of the three workmen. He took but little pleasure in his food, and during the progress of any important work, he kept a piece of bread in his pocket, which he consumed during his labour.

This asceticism of life was neither healthy nor natural. Indeed, a point in the dramatic setting that surrounds the sculptor's life, draws its pathetic note from his morbid disregard for the innocent joys of this world, and the melancholy that fastened upon him. They tell how he walked the streets of Florence "like an executioner." One thinks of him in connexion with Samuel Johnson, who fought bravely against the same curse. Still his health was better than might have been expected, for he was a weakly child.

He is described as having been middling in height, broad in the shoulders, the rest of the body somewhat slender in proportion. "The shape of his face oval, the space above the ears being one sixth higher than a semicircle. Consequently, the temples project beyond the ears and the ears beyond the cheeks, and these beyond the rest, so that the skull in relation to the whole head must be called large. The forehead seen in front is square; the nose a little flattened, not by nature, but because when he was a young boy, Torregiano, a brutal and insolent fellow, smashed in the cartilage with his fist. Michelangelo was carried home half dead on this occasion, and Torregiano, having been exiled from Florence for his violence, came to a bad end. The nose, however, being what it is, bears a proper proportion to the forehead and the rest of the face. The lips are thin, but the lower is slightly thicker than the upper, so that seen in profile, it projects a little. The chin is well in harmony with the features I have described. The forehead in the side view almost overhangs the nose, and this looks hardly less than broken, were it not for a trifling protuberance in the middle. The eyebrows are not thick with hair. The eyes may even be called small, of a colour like horn, but speckled and stained with spots of bluish yellow; the ears in good proportion; hair of the head black, as also the beard, except that both are more grizzled by old age; the beard double-forked, about five inches long and not very bushy, as may partly be observed in his portrait." His portrait, painted by himself, hangs among the portraits of great artists in the Uffizi Gallery, in company with, may I add, our own painters, Leighton and Millais.

Michelangelo returned to Florence at the age of twenty-six with considerable opportunities before him. Notwithstanding the wealth of able sculptors which Florence could once boast, there was now no one of repute to greatly interfere with his chances. Verocchio, Luca della Robbia, Desiderio, were the last of the great names passed, or passing, away. One of his first commissions was the David, which until recently stood in front of the Palazzo Vecchio, and now removed to a museum. The story of this statue is probably well known to you: how the Signory had had a block of marble in their possession for a hundred years or so, that, having been blocked out for the form of a prophet at the Carrara quarries, but blocked out badly, was put aside as spoiled, and impossible to get a figure out of. An opportunity having arisen of getting rid of the stone, Michelangelo was consulted as to its final possibilities, with the result that he promised to

shape a statue from it. The result is ingenious, for it is so tight a fit that you can see where he has come to the outside face of the block and had to leave it. It was just one of those problems that delighted him, and tickled the speculative Florentine fancy. A contract was drawn up and a special studio built; and here, for two years, for the sum of 400 golden florins, the sculptor worked. You must understand that the modern method of modelling a full-size figure in clay and pointing it off upon the marble had not been invented, and the artist probably worked from a small wax model. There are, indeed, at South Kensington wax models of the limbs of this figure some six or eight inches in length, most carefully displaying the anatomy, and it was from these that the artist doubtless worked. There was thus no certainty in the effect of his blows upon the chisel, and the extraordinary energy with which he dealt them was not calculated towards precision.

"I am able to affirm," says a witness, "that I have seen Michelangelo at the age of more than sixty years knock off more chips from an extremely hard marble in one quarter of an hour than three young stonecutters could have done in three or four; a thing quite incredible to one who has not seen it. He put such impetuosity and fury into his work that I thought the whole must fly to pieces, hurling to the ground at one blow great fragments 3 in. or 4 in. thick, shaving a line so closely that if he had overpassed it by a hair's breadth he ran the risk of losing all, since one cannot mend a marble afterwards or repair mistakes as one does with figures of clay and stucco." The David cannot be said to be a pleasing figure. The enormous size of the head, hands, and feet in proportion to the rest of the body, can only be excused or rather accounted for by the fact that the sculptor must have set himself to make a realistic representation of a raw youth, growing by pauses and snatches, and not yet fully developed. One feels in this case as one feels before all his work in varying degrees, that he started with an idea, a dominating idea which drove his mallet and chisel at the furious rate with which he is reported to have wielded them, but which seems to have been gradually and insensibly overcome by realistic influence. In this figure the idea would clearly be that of adolescence, a youthful man or a manly youth; a distinction, I may remind you, that a Greek sculptor, with his subtle refinements of expression, boasted to display. But the David—says one critic—is, to state the matter frankly, "a colossal hobbledochy."

At this time Michelangelo made the two tondi, *Madonnas* in relief enclosed in circular spaces. One of these we possess, and it hangs in Burlington House. It is very graceful, recalls the Bruges Madonna, and is not finished.

He also began an immense cartoon for a fresco in the Palazzo Vecchio, known as "The Battle of Pisa," while Leonardi da Vinci was employed upon another wall. It was done after the manner of Signorelli, whom Michelangelo always considered as the greatest Italian master, in which estimate we can hardly agree with him. Signorelli was extremely able as a draughtsman and bold as a colourist, but in effect, he was as hard as nails. For the rest of his time in Florence the sculptor seems to have given up his chisel for the composition of sonnets. Despite his extraordinary energy, he had his times of dreaming. He is said to have been by constitution saturnine and sluggish, only energetic when powerfully stimulated. Indeed, he himself would have wished to be handed down to posterity as a poet rather than as a sculptor.

Julius II. ascended the Papal throne in 1503, and with this event begins a connexion, of intimacy between two powerful natures that was to mark a long period in Michelangelo's work-a-day career. Fiery, impatient, ambitious of immense projects, but large-minded withal, Julius was a patron fit to be served. There must have been many passages of arms between man and master, some of which, at least, have been recorded.

Julius was desirous to build himself a mausoleum to do honour to his name, and he sent for Michelangelo to Rome to assist him. Two thousand ducats were given the sculptor, and he was sent off to Carrara to quarry the marble, where he spent eight months among the mountains. The Carraras stand white and bare between Florence and Spezia, in view of both cities, and the eight months must have been dreary enough. Apartments were given



to Michel near the Vatican, and a bridge was thrown across, that Julius might visit him as often as he had a mind to; and his mind was not always Michelangelo's. The drawing extant of this mighty undertaking which never reached fruition, is a mere rough ink sketch, but Condivi describes it as having four faces, and surrounded by niches filled with statues. The arts of Painting, Sculpture, and Architecture were to be represented with Julius as their patron; upon the cornice were to stand four large figures, of which Moses was one; and somewhere higher up still were two angels bearing a sarcophagus, one of them smiling as if to rejoice that the soul of the Pope had been received among the blessed spirits, the other weeping, as if in sorrow that the world had been robbed of such a man. Within was a chapel where the Pope proposed to place his remains. In all there were more than forty statues, not including histories of the Pontiff's actions in bronze reliefs.

Julius died in 1513, and it does not appear how much of the design had been executed. His successor was delegated to continue the work and the whole design was reconsidered and a new contract made, and yet another later. The only remains of this momentous and futile undertaking are the two captives of the Louvre, still unfinished, and the Horned Moses. It does not seem to have been the sculptor's fault that the work lagged. The projects were repeatedly changed by Julius in his lifetime, who had innumerable dreams in his head upon which he blew hot and cold, and after his death by the legions of busybodies that haunted the idle city. That unmatchable waster of time, a legal process, was dragged in to still further hamper matters in order to recover sums of money which it was alleged were not represented by the work done. There was a fourth and yet a fifth contract, and after many suggestions as to where the monument should be ultimately placed, it found a refuge in San Pietro in Vincoli, in the year 1545. Moses still figures in the design. All the other sculpture is from the hands of other artists. Thus, this quite unimportant work, as it ultimately became, dragged itself through forty years of Michelangelo's life. The pain and vexation that this business caused him may be illustrated by the following letter, referring to a delay in one of the contracts:—

"For the loyalty of thirty-six years, and for my having given myself of my own free will to others, I deserve no better. Painting and sculpture, labour and good faith have been my ruin, and I continually go from bad to worse. Better would it have been for me if I had set myself to making matches in my youth. I should not be in such distress of mind. I will not remain under this burden, nor be vilified every day for a swindler, by those who have robbed me of my life and honour. Only death or the Pope can extricate me. Your lordship tells me that I must begin to paint and have no anxiety. I answer that one paints with the brain and not with the hands, and he who has not his brains at his command produces work that shames him. Therefore, until my business is settled I can do nothing good. The ratification of the last contract does not come. On the strength of the other made before Clement, I am daily stoned as though I had crucified Christ. My whole youth and manhood have been lost, tied down to this tomb."

In order to attend upon Julius, the sculptor had left uncompleted his cartoon of the battle of Pisa for the Signory of Florence, and he seized the opportunity afforded by a disagreement with the Pope to return to it. Speaking of these dissensions, he says "that they all arose from the envy of Bramante and Raffaello da Urbino, and this was the cause of my not finishing the tomb in his lifetime. They wanted to ruin me. Raffaello, indeed, had good reason, for all he had of art he owed to me. Then again Pope Julius changed his mind about the tomb and would not have it made. Not knowing this, I applied to him for money, and was expelled from the chamber. Enraged at such an insult, I left Rome on the moment." "Tell the Pope," he adds, "that if henceforth he wants me, he must look for me elsewhere." Julius was equally put out by such summary treatment, and despatched five horsemen after our sculptor to bring him back, but to no purpose. Julius applied to the Signory, who at last told their scapegrace that they had no mind to go to war with the Pope because of him. "You must return," they said, "and we will write you letters of such authority that should he do you harm, he will be doing it to this Signory." So Michel took the letters and returned to his master, after having tried a

bout with him, as the Signory added, that the King of France would not have ventured on.

Michelangelo bought his pardon by executing a bronze statue of Julius for San Petronio at Bologna, on the portals of which, you will remember, Della Quercia worked. Bronze casting was not at all in Michelangelo's line, and it would not be surprising to know that the crafty old Pope was aware of the fact, and looked upon the order in the light of a task. He gave the sculptor 1,000 ducats for the job, which amount was entirely swallowed up in the endeavour and the re-casting of the statue, the first attempt having failed. The metal caked, an accident that Cellini so graphically describes, when he threw his pewter dishes into the pot to help it to burn. Writing to his brother upon the second attempt, Michel says: "Well, well, there is much to thank God for; it might have been worse." But he adds: "If I had the whole thing to do again, I don't think I could survive it." This statue stood, or sat rather, over the central door of San Petronio exactly three years, when it was thrown down in a tumult, and the remains were cast into cannon.

The next task assigned to the sculptor by his master was the painting of the vault of the Sistine Chapel for the sum of 3,000 ducats. He had had little painting to do since he left the studio of Ghirlandajo. The preliminary sketches and cartoons for this work probably took him a year at least. The date of his commencement is uncertain, but he was in full swing by January, 1509. He did not get on with his assistants. It was a peculiarity with him that he never could get along with those working beneath him. On the one hand, they irritated him, and on the other, his capacity for drudgery without proper food, sleep, or, for the matter of that, washing, interfered with those sentiments of respect with which a servant should regard the master. Then mould broke out over the first portion completed, and, in despair, he begged the Pope to release him from his contract. "It is not my trade," he again told the Pontiff, "and if you do not believe it, come and see." And Julius oftentimes did come and see, climbing up the ladders and being assisted on to the scaffold by the long-suffering craftsman. The first half of the ceiling was uncovered in November, 1509, after the painter had been shut up for two years, and the result was at once enormously popular.

The scheme of the ceiling may be roughly described as sybils and prophets alternating, and occupying the lunettes of the windows, while the Deluge, the Creation and the Fall of Adam and the creation of the sun, moon, and trees of the earth covered the vault between them. The final completion of this work was spread over years. It was suggested—it is hinted too, by jealous enemies of the painter—that other artists should be called in to finish the decoration and so make the chapel, like the Pantheon at Paris, a monument to contemporary talent. Bramante again, whom Michelangelo always regarded as a dangerous man, was credited with the suggestion. Bramante was an important architect whom we shall hear of later in connexion with St. Peter's. But it was left to the great sculptor to complete amid the many labours and anxieties of his life.

His family were a constant tax upon both his energies and his resources. A letter written to his brother Simone will illustrate the situation in which he was constantly placed.

"I have something to say to you which I have said before. If you will endeavour to live righteously and to honour and revere your father, I am willing to help you like the rest, and I will put it shortly within your power to open a good shop. If you act otherwise, I shall come and settle your affairs in such a way that you will recognise what you are better than you ever did, and will know what you have to do for your own sake. No more. What I lack in words I will supply with deeds. I cannot refrain from adding a couple of lines. It is as follows: I

have gone these twelve years past drudging about through Italy, borne every shame, suffered every hardship, worn my body out in every toil, put my life to a thousand hazards and all with the same purpose, of helping the fortunes of my family. Now that I have begun to raise it up a little, you, and you alone choose to destroy and bring to ruin in one hour what it has cost me many years and such labour to build up. By Christ's body, this shall not be; for I am the man to put to rout ten thousand of your sort, whenever it be needed. Be wise in time then, and do not try the patience of one who has other things to vex him!"

#### ARCHÆOLOGICAL SOCIETIES.

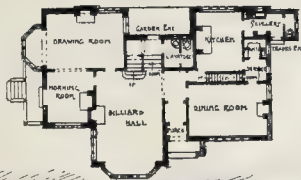
EAST RIDING ANTIQUARIAN SOCIETY.—At the annual general meeting of this Society, held on the 7th inst., Mr. St. John Hope gave an address on the interesting subject of Watton Abbey, the foundations of which were disclosed by excavations two or three years ago. Mr. Hope said there were yet many points in the history of the abbey to be cleared up, and before the paper which he had promised the Society could be written and put into a final and readable form, it would be necessary to carry out further excavations. The abbey had belonged to the remarkable Gilbertine Order, which was originated by a rector of Sempringham, in Lincolnshire, who provided this foundation for some ladies of his parish who were desirous of leading a religious life. This monastery, if it might be called so, was literally a place of entire seclusion, and those ladies having retired to it in order that they might receive the necessities of life certain lay sisters were appointed to wait upon them, and those sisters brought food to the nuns and put it through a small window or hole in the outer wall of the monastery. But Gilbert, the founder, concluded that this was not a desirable state of things, as it made it possible for the lay sisters to hold conversations with the secluded ladies on secular matters, and disturb the current of their thoughts towards higher things. Thus it came that the lay sisters also entered the monastery to perform their duties within, and without they were replaced by a number of lay brothers who attended to the external affairs of the nuns. But that arrangement also raised difficulties. It occurred to Gilbert to get over them by attempting to model his new establishment on the lines of the great Cistercian Order, which was then in a flourishing condition. He applied to that order to take those sisters under their charge, but the abbots of the order refused. Gilbert then drew up a code of rules based on those of the Cistercians. But in the case of the Cistercians a certain number of monks were priests who ministered to the wants of the community, but in the case of the ladies that was a difficulty that had to be got over. Gilbert decided to attach to each of his foundations—for that at Watton was only one of seven—a small college of from seven to thirty canons. Those chaplains were bound by the rule of St. Austin or Augustin, and some have this establishment of Cistercian nuns with Augustinian canons as chaplains. The rule was extremely exacting in laying down restrictions that were framed to keep the two sexes apart. In the church a wall was built between the canons and the nuns so that the one sex could not see the other. The Gilbertine Order did not appear to have made great progress in England. Only twenty-six monasteries of the order existed; half of them were mixed. At the dissolution of monasteries only three existed as double houses, and of these Watton was one. Mr. Hope proceeded to describe in detail the excavations at Watton.—*Yorkshire Post.*

GASWORKS EXTENSION, SELBY.—On the 9th inst. a Local Government Board inquiry was held at Selby, in relation to the application of the Urban District Council for power to borrow £4,000 for gasworks extension. The Clerk to the Council stated that the present storage capacity of the works was equal to 105,000 cubic feet. At times in 1892 the highest day's consumption was 100,700 ft.; last winter it rose to 180,000 ft. At the present time the Council had practically very little more than half storage for the maximum day's consumption. In reply to the Inspector the Gas Manager said that when the new purifier was put in they would be able to purify 425,000 cubic feet of gas per day. The new gas-holder would have a capacity of 105,000 cubic feet, and it would be constructed with a view to two other lifts being added.

\* To be continued.



GROUNDS - FLOOR - PLAN



## COUNTRY HOUSE, SUTTON.

In designing this house the problem for solution was the arrangement of a billiard-room without materially increasing the cost.

This has been overcome by using the entrance hall as a billiard-room, thus obtaining the additional advantage of a good entrance hall not usually to be found in houses of this size. The hall runs up two floors, a gallery at the staircase end serving for an access to the bedrooms. Below the staircase is arranged the garden entrance through which would be obtained a glimpse of the garden from the hall.

The materials are red brick, and stone facings to the large hall window. Portions of the upper parts and walls are finished with rough timbering and plaster, the timber being treated with Stockholm tar. The roof is to be finished with brindled tiles.

ERNEST RUNTZ.

## COMPETITIONS.

EXHIBITION BUILDING FOR GLASGOW.—The designs for the Glasgow International Exhibition of 1901 have been considered by a sub-committee, with the result that premiums have been awarded as follows:—The first premium (250*l.*) to Mr. James Miller, 223, West George-street, Glasgow, for design signed "Winter Palace"; the second premium (150*l.*) to Mr. A. N. Paterson, 136, Wellington-street, Glasgow, for design signed "Aiblins"; and the third premium (100*l.*) to Mr. John A. Campbell, 44, West George-street, Glasgow, for design signed "Fin de Siècle" (rather a misnomer for a design for an exhibition in 1901). It is understood that the appointment of Mr. James Miller as architect for the buildings has been formally confirmed. The competition was

limited, we believe, to Glasgow architects; very properly, considering the amount of architectural talent which Glasgow possesses.

## ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—Some of the members of this Society made an excursion to Launceston on the 10th inst., when the ruins of the Priory were inspected under the guidance of Mr. Olho B. Peter, by whose direction excavations were made in 1893, when the foundations of the old buildings were uncovered, which included, when complete, a church about 260 ft. in length. The Priory was of the Austin Canons, founded in 1170 by Bishop Robert Warelwast. A fine Norman doorway now forms an entrance to the White Hart Hotel. The parish church of St. Mary Magdalen, built in 1524-40, was visited. Constructed of granite, it is characteristic of the period when artistic construction had given place to surface decoration, its outer walls being almost covered with carved panels. It is a great contrast to the exceeding plainness of many of the country churches. The old castle was also visited.

NAVAL COLLEGE, DARTMOUTH.—We understand that preparations for the erection of the new Naval College at Dartmouth, in place of the cadets' training ship *Britannia*, will commence almost immediately. The plans by Mr. Aston Webb have been approved by the Admiralty. They provide for the accommodation of 260 of the young officers as well as the permanent staff of instructors. The college will be three stories high, and will comprise a central block, with clock tower and wings stretching right and left. There will be a raised terrace in front. One of the old ships will be retained in the river for the accommodation of the sailors attached to the college. The erection of the building is expected to occupy four years.

## Illustrations.

## PROPOSED CHURCH OF ENGLISH MARTYRS, YORK.

THIS should have been entitled on the plate "Proposed church," but it was only after the lithograph had been printed that we learned from the architect that the scheme had been, in fact, abandoned after the design had been made.

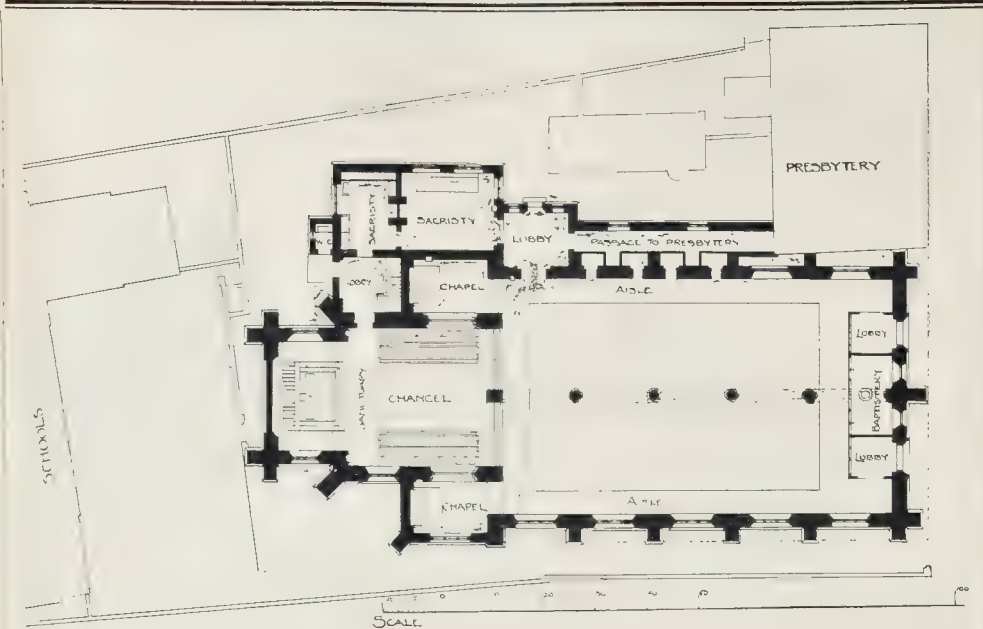
The design was made originally under the firm of Goldie, Child, & Goldie, but was really the design of Mr. E. Goldie, the present representative of the old firm.

The plan, as will be seen, is of some interest from the treatment of the nave as two aisles with a central arcade. In the exterior the position of the octagon turret is happy, and it contrasts picturesquely with the wide low tower. The duplicate arrangement of the nave is effectively shown on the west elevation.

## HAMBURG TOWN HALL.

THE new Town Hall at Hamburg, which has just been taken into use, has been long under consideration—in fact, practically ever since the destruction of the old Town hall in the great Hamburg fire of 1842. Numerous proposals were already made at the time as to a suitable site and the general arrangements, Sir Gilbert Scott, among others, being consulted, as well as the Superintending Architect to the Senate, Mr. William Lindley. Gottfried Semper also made suggestions at that time. After the matter had then been shelved for a number of years, an International Competition was opened in 1856, and, of the forty-four architects who competed, Sir Gilbert Scott received the first premium. The idea of giving the commission





Proposed Church of the Holy Martyrs. Plan.

[See previous page.]

to a foreigner, however, seemed distasteful to the Hamburg Senate, and, after various postponements, another competition was again tried in 1876, when Messrs. Mylius & Bruntschli (who, we believe, are Swiss architects) obtained the first prize. Again the award was apparently distasteful to the Hamburg authorities, though they seem to have been at a loss as to the selection of a local architect, for there was certainly no one at the time among the members of the profession at Hamburg who stood head and shoulders over his confrères. After various further attempts it was hence finally decided to place the commission in the hands of a Committee of local architects, who were, if I may say so, to prepare a collective design. The members of this committee were Messrs. Grothjan, Haller, Hansen, Haers, Lamprecht, Meerwein, Robertson, Stammann, and Zinnow, of whom, however, Messrs. Robertson and Lamprecht died before the foundation stone was laid. Herr Haller acted as Chairman of the Committee, whilst the General Manager and Secretary appointed under their auspices was Herr Geissler.

For a building designed by a committee after a protracted preliminary history as described above, and, considering all the petty rivalry and the interference of busybodies, the new town hall is certainly not as unsatisfactory as might have been expected, though it is essentially common-place both in general design and in detail. No doubt Hamburg can pride itself on the building, which is entirely the work of local men, for, apart from the design, its execution was placed entirely in the hands of Hamburg firms, and every possible effort was made to prevent anything going to outsiders. It is interesting to observe, however, that whilst in 1885 the estimate showed the figure of 230,000*l.*, the small bill of extras has run the accounts up to nearly half a million sterling. Taking the design as such and also the lack of perfection in its execution, we, however, scarcely think that Hamburg has had its money's worth, unless the embodiment of local effort as shown in the Hamburg Town Hall is valued by the authorities at some special figure.

The plan of the building was given in our issue of January 5, 1895, in connexion with a general view of the exterior. It does not show any feature of special interest, excepting, perhaps, in the negative sense that some of the corridors are very dark for a structure of this description. The principal rooms are on the first-floor level, and comprise a grand central hall, a Council chamber for the Common Council, a Council-room for the Senate, and further numerous ante-rooms and parlours. The offices are

mainly on the ground floor and on the second floor, whilst much of the basement is taken up by the *Rathskeller*, or "tavern," which is so characteristic of the German Town Hall, and which in this instance is by far the best part of the interior of the building.

The Town Hall will always, no doubt, be considered an important structure, owing to its associations and its massive proportions, but as far as architecture is concerned, we are afraid something much better was expected when a city of such importance as Hamburg expended half a million sterling on a new home for its Hanse and Municipal Government.

#### PALACE GATE HOUSE, KENSINGTON GORE.

THIS house has just been finished after undergoing very extensive and substantial remodelling. As it now stands the frontage on Palace Gate is entirely of Portland stone. The dining-room is panelled in English oak, with an oak ceiling and stone mantelpiece. The hall and staircase are also in English oak, the ceilings being in carved plaster, as well as the soffits of the staircase. The study and the morning-room are examples of careful treatment in painted wood. The drawing room, on the first floor, the interior of which is shown in the lithograph, is panelled and decorated in pear wood, the walls between the panelling being hung with silk, while above is a carved plaster frieze, the ceiling also being of the same material.

Mr. C. J. Harold Cooper is the architect. The front elevation of the house was exhibited at the Royal Academy this year.

#### BRIDGE OVER THE KELTNEY BURN.

A SMALL road bridge, composed of steel arches supported by masonry abutments, has recently been constructed over the Keltney Burn near Aberfeldy, one of the most picturesque spots in the Highlands of Scotland. The general appearance of the bridge is shown in the accompanying view; the constructional details are given in the lithograph.

The structure consists of four arched ribs, 60 ft. span, and 9 ft. rise at the crown. These ribs are each composed of a web plate, 15 in. by  $\frac{1}{2}$  in., and four angles 4 in. by 3 in. by  $\frac{1}{2}$  in., and are designed to carry safely all ordinary road traffic.

The floor is composed of  $\frac{3}{4}$  in. curved steel plates, carried by cross girders placed 5 ft. apart. These floor plates are jointed along the centre line of the bridge, and are well stiffened

by longitudinal angle and tee bars. The curved portion of the plates is filled with concrete, upon which is placed 6 in. of metalling to form the roadway.

The cross girders are composed of four 3 in. by 3 in. by  $\frac{3}{8}$  in. angles bars, and a web 7 in. by  $\frac{1}{2}$  in. A lattice parapet, having a steel handrail, is fixed along both sides of the bridge. The abutments have been built of rough-cast rubble masonry, this class of work being found very suitable in the Highland districts, the rough-cast face forming a valuable protection against the driving rains so frequently experienced in this part of Scotland.

The architects for the bridge were Messrs. Dunn & Watson, and the works were carried out by Sir William Arrol & Co., of Glasgow, the details of the steelwork, given in the lithograph, having been designed by Mr. J. E. Tait, of that firm.

This has been an attempt to treat a steel girder bridge in a simple and, as far as possible, in a picturesque manner, and the result is certainly more pleasing in this sense than is sometimes with bridges of this class. Mr. Tait suggests that one reason why there is a general idea that steel bridges are or must be unpicturesque is that the public are more familiar with the appearance and the details of stone and timber construction than with those of steel, and hence regard the latter as ugly and artificial in comparison; in other words, that when steel structure and details become more popularised, there will be the same sentiment in regard to them as there now is in regard to the older methods of construction. This is a view of the matter which is worth attention, at all events; though it must be remembered that there is an essential difference between a natural material like stone, which has the colour of nature, and is merely shaped for its purpose, and an artificially prepared material like steel, which, moreover, must necessarily be painted. As compared with timber, also, the thin proportions of steel structure are unsatisfactory to the eye in combination with nature. It is possible, however, that habit may alter our feeling in this respect to some extent, and that at the close of the twentieth century the steel bridges of the present day (or some of them) will find place in sketch-books as picturesque features in the landscape.

ROMAN VILLA, DARENTH.—It is stated that the remains of this villa will shortly be covered up again, and corn grown over the site. Those who wish to see it before its disappearance should therefore lose no time.





CHURCH OF ENGLISH MARTYRS, YORK. MESSRS. GOLDIE, CHIFF & CO. ARCHITECTS.







ANGLE OF PRINCIPAL FRONT.



ANGLE OF COURTYARD.



THE COUNCIL ROOM.



THE RESTAURANT





*Prince of Wales  
Residence, N.Y.  
see W.A. Morrison's plan  
C. J. Hinton & Co. Architects  
New York, N.Y.*



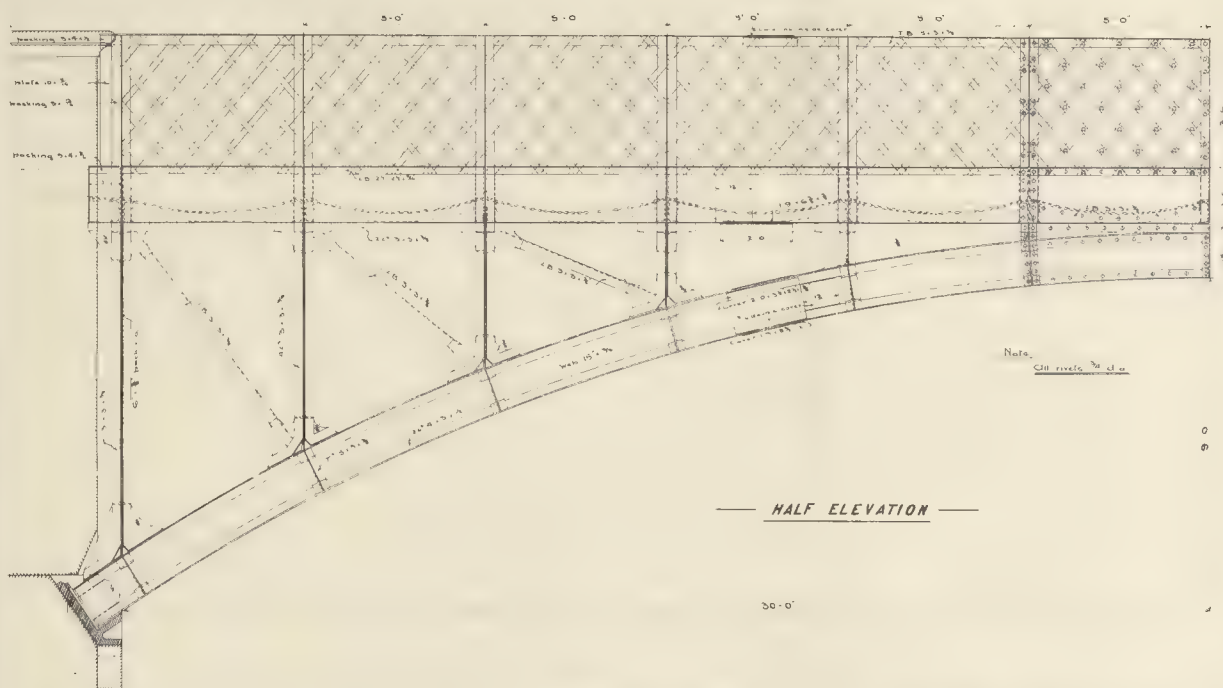
*Receiving Room, Prince of Wales, see W.A. Morrison's plan*

*C. J. Hinton & Co. Architects, New York, N.Y.*

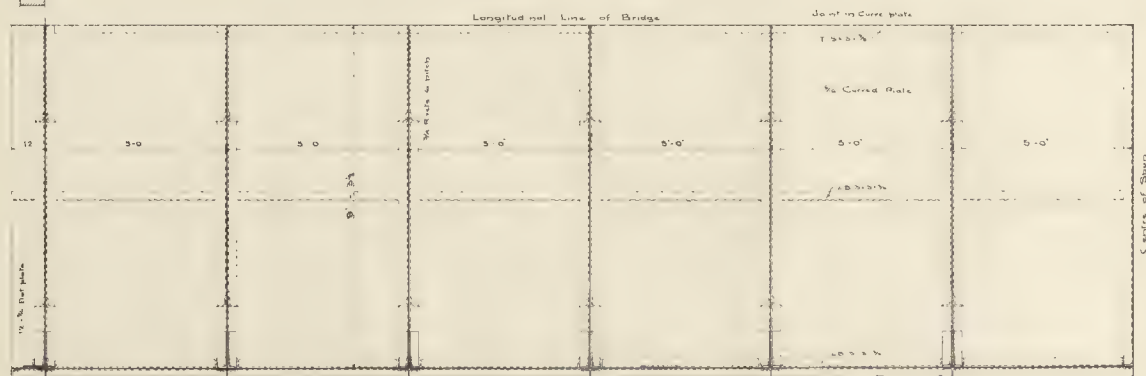




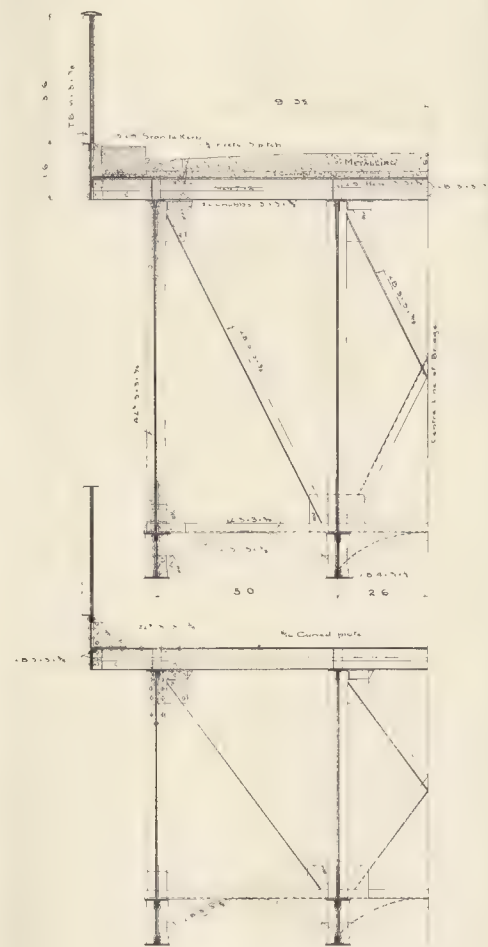
KELTNEY BURN BRIDGE: CONSTRUCTIONAL DETAILS.



### HALF ELEVATION



## PLAN



CROSS SECTION

SCALE

10. *Exp.*

stimulus of electricity. The President then placed before the meeting the results of his own researches in late years, dealing principally with chemical and spectroscopic work, concluding with an apology for psychic research, "subconscious workings of the mind," and other matters of like nature into which we need not penetrate.

On Thursday, the 8th, the sectional work of the meeting began, and presidential addresses were delivered in all sections except that of Anthropology. In the Mathematical and Physical Science Section Professor Ayrton devoted his address principally to a discussion of the phenomena of the atmospheric propagation and dissemination of smells. At the commencement he observed that it seems as if electric traction is destined in time to annihilate magnetic observatories near towns, and even to interfere with telegraph and telephone systems—the system of electric traction has already destroyed the two most important magnetic observatories in the United States and British North America. Passing to that branch of physics dealing with the phenomena of the sense of smell, he noticed that it is a generally accepted idea that metals have smells peculiar to themselves, since, if a piece of metal be taken at random, a smell can generally be detected. But he finds that this is due to their dirtiness, and that, as they are carefully cleaned, they emit no smell. Abrasion by friction, however, does serve to produce a metallic smell; before a metal can evolve a smell, chemical action must, apparently, take place. Although smell may not, like sound, be propagated by vibration, it seems probable that particles of the metal with which we have become accustomed to associate the particular smell, may no more come into contact with the olfactory nerves than a sound, being musical instrument strikes against the drum of the ear. He believes that the metallic particles may act on the moisture of the air and liberate hydrogen containing impurities, and that it is the latter which produce the smell, and not the particles of the metal. A phase of the subject of more immediate interest to us is that relating to the diffusion of smell. Professor Ayrton shows that when the space through which a smell passes is screened from draughts, it diffuses with surprising slowness. Its actual diffusion, therefore, is largely controlled by the motion of the air. The power of a smell to cling to a substance seems to depend neither on the intensity of the smell, nor on the ease with which it travels through a closed space. The absorption of scents by glass led him to try whether an actual transpiration through glass could be detected with the nose. For this object a number of extremely thin glass bulbs were blown from soda and from lead glass, so thin that they exhibited colours like a soap bubble, and after odorous substances had been introduced into them they were hermetically sealed and placed separately in glass-stoppered bottles. In some cases, on removing the stopper from a bottle after many hours, a faint odour could be detected, but careful search seems to indicate that minute flaws existed in the glass. There can be no doubt that Professor Ayrton has called attention to a branch of physics hitherto unexplored, and which is destined in its practical applications to be of great service to several branches of sanitary science. Hitherto the phenomena of smells have been approached almost exclusively from medical, anatomical, and chemical standpoints. The investigation has, however, only just been commenced; what has been done is of the slenderest description and of the most elementary character.

In the section devoted to Chemistry, the President, Professor Japp, dealt especially with stereochemistry and vitalism. In the course of his remarks he observed that, of the numerous discoveries made by Pasteur, none appeals more strongly to chemists than his work in establishing the connexion between optical activity and molecular asymmetry in organic compounds—the capital achievement of organic chemistry. Physiologists, as well as the majority of people, were, on the other hand, naturally more attracted by Pasteur's subsequent work, in which the biological element predominates. And yet his earlier work ought to be of interest to physiologists, not merely because it is the root from which the later work springs, but because it furnishes a reply to the most fundamental question that physiology can propose to itself—namely, whether the phenomena of life

are wholly explicable in terms of chemistry and physics; in other words, whether they are reducible to problems of the kinetics of atoms, or whether, on the contrary, there are certain residual phenomena inexplicable by such means, pointing to the existence of a directive force which enters upon the scene with life itself, and which, whilst in no way violating the laws of the kinetics of atoms, determines the course of their operation within the living organism. The President then went more fully into the subject of optical activity of organic compounds, and the relation between optical activity and life.

In the section of Geology, presided over by Mr. W. H. Hudleston, the address dealt mainly with the geology of the south-west of England, east of Dartmoor; also on some problems connected with the coalfields in the south of England. That part of the address on the Bristol area was very largely a *résumé* of some well-known work done many years ago; but in the section dealing with "Coal in the South of England" there are some interesting observations and suggestions. Mr. Hudleston remarked that coal would probably be found east of the proved Somersetshire coalfield. The question of the existence of coal south of the Mendips he avoided as being too speculative; we do not see why, however. That portion of the field to the south of Radstock is merely cut off and reversed on itself by the upheaval of older rocks in the Mendips. There is every reason to suppose that before that upheaval took place the coal-seams were continuous, and were simply interrupted locally along the line of the Mendips. We fail to see why this should be more speculative than the question of finding coal to the eastward of Bath, and regret that Mr. Hudleston did not deal with the problem. He regards the vale of Pewsey in Wiltshire as a probable locality for coal. The failure of the coal-borings in the Eastern Counties was next touched upon, but the theme is worn out, being practically denuded of anything original.

In the Mechanical Science section the President, Sir J. Wolfe Barry, touched upon the growth of British shipping, and the recent and future demands for dock accommodation at Bristol and throughout the kingdom; and finally dealt with the necessity for experimental research as the basis of engineering science. He observed that the conditions of commerce now necessitated larger quays and warehouses, better railway approaches, improved sidings, better machinery, as well as deeper water and better approaches to it. Liverpool last year undertook to spend nearly five millions on such works, and we know of very many important projects at other places. Taking the expenditure within the past decade, and adding to it the authorised expenditure at Liverpool, at the great ports on the Bristol Channel, on the Thames, at Southampton, Hull, Middlesbrough, Hartlepool, Sunderland, the Tyne and its neighbourhood, at Grangemouth, the Fife ports, at Glasgow, the Ayrshire ports, the Cumberland and Lancashire ports, and so round the British coasts to Preston, he roughly estimates the expenditure, either made during the past ten years, or contemplated, of some thirty-five millions. Passing to the question of the provision against wind pressure in structures, Sir J. Barry spoke of the danger of hasty generalisation. A great deal of money had been wasted in unnecessary provision against wind strains of 36 lb. per square foot on large areas, in consequence of hurried generalisation from insufficient data. He knew something of what the Tower Bridge, but did not wish to mention it; but if the public had been told that the dictum of experts, arrived at however hastily in 1880, was to be set aside in the construction of that bridge, all confidence would have been destroyed in it beforehand, and no Committee of Parliament would have passed the Act. Dealing with the question of establishing a public physical laboratory the President stated that there is now more hope for experimental science and some endowment of research in this country than at any former time. Last year a deputation waited upon the Premier, and Government, whilst somewhat limiting the scope of inquiry, appointed a small Committee to examine and report on the subject. The Committee, after taking much evidence, visiting a similar and highly successful institution on the Continent, and exhaustively studying the question, were convinced of the great public benefits which may be expected from such an institution, and have unanimously

reported in favour of its establishment. In the columns of this journal we have frequently urged the formation of such a laboratory, and we shall be glad to find that the work in it is not altogether confined to the elucidation of problems of theoretical interest only, but will be extended to such subjects as testing materials of construction, and the like.

On Friday, in the Mathematical and Physical Science section, Professor O. Lodge described a magnifying or bellowing telephone, consisting of a small light coil capable of moving in a strong magnetic field, and attached to the disc of a microphone transmitter. When the telephonic current is sent through the coil the latter moves, setting in motion the disc of the microphone. A current is thus made and broken in the microphone, which can be sent through the coil of a second apparatus similar to the first. By means of three or four such instruments a very minute sound can be greatly magnified. The author stated that he had not succeeded in obtaining a sound louder than the human voice. Mr. W. H. Prece observed that the Post Office had succeeded at Newcastle in producing a "howling telephone" by using the secondary current from an induction coil, the primary of which was in circuit with an alternating hand dynamo. Lord Kelvin read a communication from Dr. A. Galt on the "Heat of Combination of Metals in the Formation of Alloys." The alloys investigated were brasses with various percentages of copper and zinc, and the heat of solution in acid of brass, and of its copper and zinc separately, and to deduce from the results the heat of formation of brass. In the discussion on this paper Lord Kelvin referred to the work of Professor Roberts-Austen on the rise of temperature of molten metals when solid metals are dropped into them. Professor H. L. Callendar described an instrument for measuring electric pressure or current by means of the increase of resistance of a fine platinum wire due to the heating effect of the current passing through it. It is most suitable for use as a voltmeter. Professor T. Preston gave an account of his experiments on radiation from a source of light in a magnetic field, in which the results obtained by Zeeman are photographed, using a large grating spectroscope for the purpose. On the same day the International Conference on Terrestrial Magnetism and Atmospheric Electricity was held under the presidency of Professor Rucker.

In the Chemistry section Professor Sydney Young read a paper on "Some Researches on the Thermal Properties of Gases and Liquids," in which the author details the results of his work for some years past in establishing the thermal properties of an extensive series of compounds. Professor P. F. Frankland made a communication on "The Action of Bacteria on Photographic Plates," in which he stated that ordinary bacterial cultures in gelatine and agar-agar are capable of affecting the photographic film even at a distance of half-an-inch, whilst when they are placed in contact with the film, definite pictures of the bacterial growths can be obtained. This action does not take place through glass.

On Saturday but little was done, as several excursions had been arranged; but in the Physics section the department of Meteorology was presented the report of the Committee on Ben Nevis Observatory. Hourly eye observations by day and night were recorded throughout 1897. The tabulated results included mean atmospheric pressure and temperature and the extreme pressures and temperatures; rainfall, sunshine, and velocity of wind. Professor John Milne presented the report of the Committee of Seismological Investigation, which contains a record of progress made towards the establishment of earthquake-observing stations round the world, some notes on particular earthquakes, also a discussion of some characteristics of earthquake motion, and the relation of earthquake phenomena to magnetic and sub-oceanic disturbances.

In the section of Mechanical Science Mr. T. Foster Brown read a paper on "Some Mechanical and Economic Features of the Coal Question." The question has been well thrashed out on previous occasions, and little fresh is added to our knowledge by the communication. The author believes that we shall have exhausted eleven-fifths of our best resources of coal about the year 1950, and shall then have arrived at a stage when our whole annual output will be



composed of a rapidly increasing proportion of deep, thin, or inferior coal. After that there will be coal remaining which could be worked at a gradually increasing cost, sufficient for the supply of the nation for a period of 250 years at an average output of 250,000,000 tons per year. Such calculations, we may add, are of very little value, for they always assume that we know exactly the extent of all our coal-fields, and cannot possibly take into account with any degree of accuracy the quantity of coal available in comparatively unexplored areas of the country in all probability coal-bearing. Neither can the annual consumption of coal be predicted for so long a period.

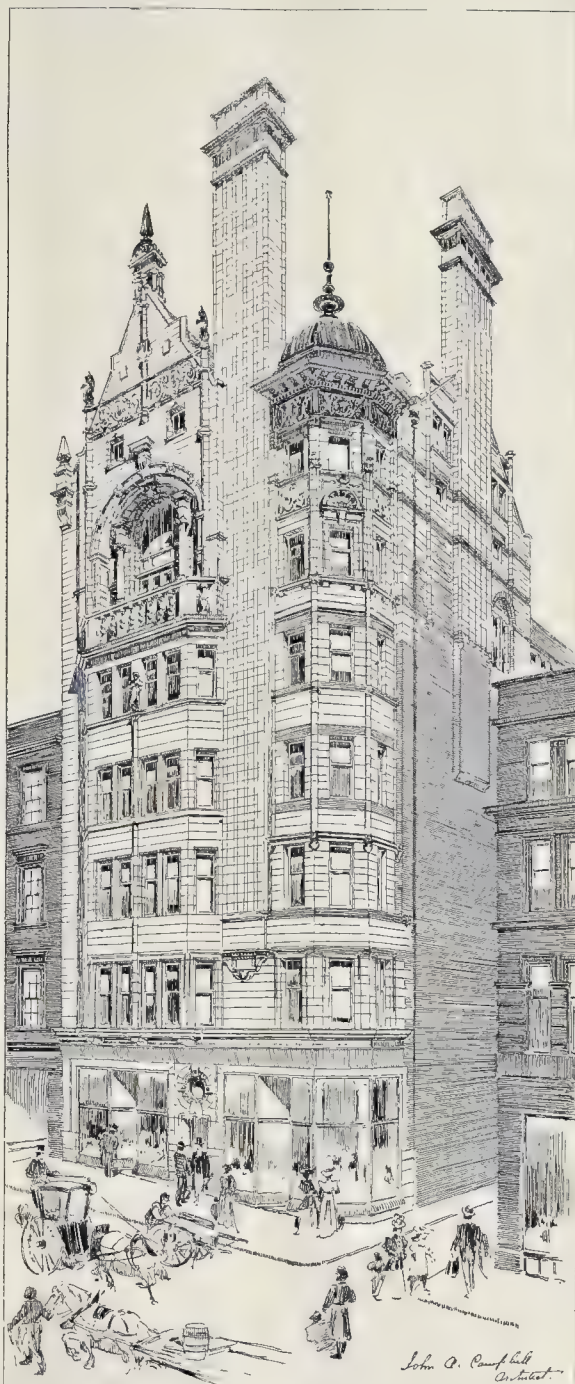
On Monday the Geographical Section was most extensively patronised to hear the adventures of M. de Rougemont. The Mathematical Section was principally occupied with astronomical matters and with the conference on Terrestrial Magnetism. The Geologists were regaled by a paper by Mr. R. Etheridge on the "Relation and Extension of the Franco-Belgian Coalfield to those of Kent and Somerset." Most of the information is old, but Mr. Etheridge places on record the results of coal-borings at Pluckley, west of Brabourne and Penshurst, the latter being twenty-five miles west of Dover and some 1,700 ft. deep. The Brabourne trial has passed through 1,875 ft. of sedimentary rocks, ranging from the Gault to the Lower Lias inclusive, but the bore-hole has passed into the red conglomerate of, perhaps, Old Red Sandstone; in all probability the depth would be increased. We may point out that although older beds than the Coal Measures have been met with in this boring, the former may be thrust over the coal, or reversed—phenomena common enough in the extension of the Dover coal-field on the other side of the Channel. Professor Boyd Dawkins observed that he was at present undertaking five or six borings in the south-east of England, and he proposed to go on boring until he found out the direction of the dip, and then he hoped to verify the existence of coal to the north and east of Dover.

On Tuesday there was a flagging of interest in practically all sections. The mathematicians and physicists and the members of the Mechanical Science Section met jointly to discuss "The Magnetic and Electrolytic Actions of Electric Railways." Professor Rücker gave an account of disturbances of a magnetic instrument produced by the City and South London Electric Railway at distances of  $\frac{1}{2}$  mile,  $2\frac{1}{2}$  miles, and  $3\frac{1}{2}$  miles respectively. In every case the disturbance was such as to render any records of the motion of the magnet absolutely valueless. Again, at Greenwich, the vertical force and earth-current records have been rendered useless from similar causes. Other speakers followed on in the same strain. The Committee on Electric Standards reported that the work of testing the resistance coils of the Association, and of comparing other coils with the Association's standards, had been continued. The standards are to be removed to Liverpool from Cambridge.

The Chemistry section was very busy, there being no fewer than fifteen papers in the day's list. A communication of special interest to us was made by Dr. S. Rideal on "Standards of Purity for Sewage Effluents." He pointed out that the majority of these standards are arbitrary and artificial. But a calculation of the proportion of nitrogen in its oxidised forms which are harmless, and its unoxidised forms which are odorous and sometimes deleterious, would denote the extent to which the sample has been purified. We may mention that the principle involved in this is by no means new; for many years something like it has been employed in estimating the quality of water for drinking purposes.

The section of Mechanical Science considered a paper by Mr. E. D. Marten, Engineer to the Severn Commissioners, on some "Schemes for the Improvement of the Waterway between the Bristol Channel and the Birmingham District"; whilst Mr. W. Walker read a paper on "Hydraulic Power Transmission by Compressed Air." The apparatus employed for the latter purpose is Taylor's hydraulic air compressor. In this the air is compressed by becoming entangled as bubbles in a falling stream of water, the head due to which affects the compression. It was stated that the advantage of obtaining power in this manner, as compared with utilising the available head in a turbine, was not apparent unless the power had to be conveyed some distance. The apparatus is especially valuable in new

countries where there are rapids or waterfalls. On Wednesday the meetings were brought to a close, though most of the sections had finished their work on the previous day. In the Physical Section, amongst other papers, was one by Mr. S. R. Milner and Professor A. P. Chattock, on "The Thermal Conductivity of Water"; the result of forty determinations gave 0.001435 c.g.s. units as the conductivity of water at 20 deg. centigrade.



PREMISES, 166, BUCHANAN-STREET, GLASGOW.

This building has a frontage of 45 ft. to Buchanan-street and side elevation of 130 ft. to Dundas-lane. It is to contain shops and offices, is of fireproof construction, and is served by a hoist. The proprietors are the British Workman's and General Assurance Company, Limited. There are seven stories and attics to



Buchanan-street, and six stories and attics to Dundas-lane.

JOHN A. CAMPBELL.

#### BOOKS RECEIVED.

THE CATHEDRAL CHURCH OF WELLS. By the Rev. Percy Dearmer. (Geo. Bell & Sons.)  
INSPECTION OF THE MATERIALS AND WORKMANSHIP OF CONSTRUCTION. By Austin T. Byrne. (John Wiley & Sons, and Chapman & Hall.)

### The Student's Column.

#### SOUND, LIGHT, AND HEAT.—XII.

##### SOUND-PROOF WALLS (continued).

**W**E have seen that the velocity of sound in solid bodies is, in a measure, an index of their value as sound-proof materials. In the last article we showed that this property could be materially modified and better results obtained by taking advantage of certain methods of construction.

In such woods as walnut, fir, and ash the velocity is very high, ranging from 15,744 ft. per second in the first-mentioned, down to 15,314 ft. per second in ash. It is evident, from what has been already said, that none of these woods are suitable for wainscoting on thin partition walls, though when used in small pieces they might possibly be tolerated, especially when cut across the grain. Elm and cedar are a little better, the velocities in them not being so high; but the two best of the commoner kinds of wood are oak and pine, the velocity of sound in the latter being only 10,900 ft. per second, as already mentioned in another connexion.

Although we have, so far, only dealt with wood for sound-proof purposes, we are, of course, perfectly well aware of various other substances that have been proposed. Let us now consider some of these. Ignoring tallow, wax, and paraffin, which can only be regarded as materials for temporary expediency, though very efficacious for the time being, the velocities in them going down as low as 1,180 ft. per second. Lead stands in the front with a propagating velocity of 4,633 ft. per second. This metal may be laid on in sheets, and there must be no "leaks." True lead must be obtained as far as possible, for the different kinds of compo. are not as good for the purpose. Pewter is not bad, but has more vibration in it than lead, and the sound is not as readily "absorbed." We do not suppose that gold-plate lining will ever come into general use, but the precious metal has not double the propagating velocity of lead, and is an excellent sound-proof material.

The same may be said of silver, which yields results only a little inferior to gold. The value given for copper is 12,104 ft. per second, but that must only be taken in a very general way, for in the act of rolling copper sheeting a fibre is almost always imparted to the metal which (as we have seen in reference to wood) is undesirable. Copper sheets electrolessly deposited would be much better, especially if used in small pieces and put together as in covering the lower part of the hulls of yachts, and the like. Its value as a sound-proof material is about the same as that of oak and in certain situations may be preferred as it can be used in thinner sheets and economises space. Wrought iron and steel are not suitable for the purposes mentioned; the velocity of sound in them reaching as high as 16,498 ft. per second. Glass is almost as bad, though we may have something to say concerning its use for purposes of reflection of sound.

For many reasons wood will be preferred by most people for wainscoting, though, as we see, certain metals are better as being more sound-proof. A judicious construction where money is practically no object, would be a combination of metal and wood. If the student will turn to the diagrams in our last article (p. 234 *ante*) he will perceive the position of the "cut-offs" near the ceiling and floor (fig. 1, *b*, *c*, fig. 2, *b*, *c*, and fig. 3). As lead has a much lower velocity than any kind of wood that metal could be employed with advantage throughout in the positions *b* and *c*. It is hardly necessary, however, to point out to the architect some manifest disadvantages attaching to the employment of lead in the positions indicated—its tendency to "buckle up," great weight, and the difficulty of repair when the wall has to be perforated in wiring for electric bells, electric

light, and what not. Still, for colleges of music, where instruments are being played in adjacent rooms, and absolute quiet is required, the mode of combining soft metals with wood after the manner indicated might be taken into consideration.

Turning to another class of substances—stucco, plaster, cement, &c.—it may be remarked that these have found much favour in late years, and many kinds are efficacious enough when used in sufficiently large quantity. In the majority of cases, however, the partition walls have to be extra thick to permit them to be employed to the best advantage. Of course, any wall may be made sound-proof if made thick enough; the point is, especially with partition walls, to combine lightness and economy with sound-proof conditions—that is what we are aiming at.

Where walls for several reasons have to be constructed hollow, the difficulties of making them sound-proof are greatly increased. The real reason why in many buildings, such as those erected for cheap flats, or the eligible suburban terrace, the partition walls between rooms let so much sound through is because, owing to scamped work, the walls are often hollow. In such work it is a common thing to find the laths merely nailed to wooden uprights and plastered outside, leaving more or less space between the uprights. This method, which is the jerry-builders' own, leads to one of the greatest nuisances the occupants of "eligible suburban residences" have to endure. It is in cases such as this in respect of which the law courts hear most of the properties of the non-sound-proof wall. We know of no way of "curing" such a wall except to pull it down and rebuild it properly.

Even in better built houses but little care seems to be bestowed on ceilings and the floors above them. There can be no question that the requirements of the plumber and gas-fitter have had their influence in this. When the "gas leaks" it is so easy to pull up the boards and inspect the pipes? The acoustic properties of the floor and ceiling below count for nothing in comparison with this facility: so to accommodate the gas-fitter the floor and ceiling are so constructed as to act as two sounding boards, leaving a resonant air-space between. It is hopeless to expect to get a quiet room with such methods of construction, and people beneath will always hear when any one is walking on the floor above—the floor could not be better constructed for the purpose.

We are not aware of any experiments carried out to ascertain the velocity of sound in brickwork. That must, however, very largely depend on the class of bricks used and the mortar or cement employed. The general result cannot be very high, for we know from Mallet's experiments that schistosity even with their accompanying contortion and general direction of schistosity yield only just over 1,000 ft. in a second. Again, solid granite gives us only 1,664 ft. per second. We imagine, however, that the result with ordinary brickwork must be higher than this. The writer is of opinion that the time has come when more experiments in regard to the propagation of sound in building stone should be carried out. When Mallet derived the results mentioned, the means of ascertaining them were not as accurate as they now are. And unless we are very much mistaken the "solid granite" referred to was not granite as used in building, but as it occurs in the field. It is true that he also ascertained the velocity in "discontinuous granite"—whatever that may mean—and found it to be some 350 ft. per second less than in the solid granite. By "discontinuous granite" we presume that granite veins penetrating some metamorphic rock are implied, as Mallet usually carried out his masterly observations on a large scale, and not from the architect's but from the seismologist's standpoint, we believe.

The "solid granite" will, no doubt, have been permeated by numerous open joints; if not, the results are inexplicable. We refuse to believe that sound is not more rapidly propagated in granite walls than it is in tallow, and that wax is not a better sound-proof material than solid granite. Exhaustive and new experiments on granite, sandstone, and limestone walls are badly wanted. Any results on granite will be seriously impaired unless it is explicitly ascertained whether the rock is foliated or not. Again, a coarsely porphyritic granite we should expect to yield widely different results to a close-grained one. The great

crystals of felspar in the former must act detrimentally to the propagation of sound in the stone. To be told that paraffin gives almost three times the velocity of "solid granite" is certainly beyond belief.

With brick walls, it is clear that the more solid and homogeneous bricks will allow sound to pass more readily than stock bricks, sand-bricks or rubbers. We have no figures to quote, but that must be the case following on the known laws of the propagation of sound in divers substances. No doubt the straight edges in bricks are responsible for conducting some of the sound, but unless the mortar is exceedingly hard they cannot have a preponderant influence. It so happens that in most well-built walls where very hard bricks are used hard cement is required to hold them together, so that the wall may almost be regarded as a solid throughout. As the student knows, however, the cement or mortar must to some extent act as a "cut-off." In general terms we should say that terra-cotta bricks yield the highest velocity, hard Staffordshire blues rather less; then come brindles, after which ordinary wire-cut reds, red pressed, stocks, and gaults would be found, the best for arresting the passage of sound being sand-bricks and rubbers.

#### GENERAL BUILDING NEWS.

**CHAPEL, BURY ST. EDMUNDS.**—The foundation stone of St. Saviour's Chapel, Thingoe Union House, Bury St. Edmunds, was laid last week. The chapel will be built of red brick, with slated roof, and will accommodate about 120 persons. The architect is Mr. Atkinson, of Cambridge, and the builder, Mr. H. G. Frost, of Bury St. Edmunds.

**YOUTH MEN'S INSTITUTE, MOTHERWELL.**—It is proposed to erect a young men's institute at Motherwell. On the ground floor there will be shop, office, reception-room, and social parlour, and on the first floor a hall to seat 275 persons, with retiring-rooms, recreation and reading rooms. At the rear will be the gymnasium (60 ft. by 30 ft.), baths, cloak-room, &c. The architect is Mr. Alexander Cullen, whose plans were selected in competition.

**ST. MARY MAGDALENE, BERNMONDSEY.**—This church re-opens on the 18th, after repairs, the formation of a new vestry, and entire redecoration. The work has been carried out by Messrs. H. G. Bartlett & Co., Briston, under the superintendence of Mr. Edward Crosbie, architect.

**VICTORIA HALL, BOURTON-ON-THE-WATER.**—This hall, in course of erection, is being built of local stone; the outside measurement is 54 ft. by 28 ft., with a staircase wing, on the side remote from the river, of 13 ft. by 20 ft. On the ground floor accommodation is arranged for a billiard-room, reading-room, and committee-room, with lavatories. On the top floor the whole space is devoted to an assembly-room; it is 54 ft. long by 24 ft. wide, and will seat about 200 people. A permanent platform will be erected with a staircase communicating with the committee-room below. The height of the building from the ground-level to the top of the vane is 52 ft. The building is estimated to cost 1,100l. The contractors are Messrs. Cluford & Son, of Bourton; the architects being Messrs. Prothero & Philpott, of Cheltenham.

**ADDITIONS TO CHURCH, FORDER, SALTASH.**—Foundation stones of the new schools and additions to Forder Wesleyan Chapel, Saltash, Cornwall, were laid on the 8th inst. The chapel is to be enlarged, re-seated, and renovated, and Sunday schools will be attached. Mr. Edgar M. Leest, of Saltash and Devonport, is the architect, and Messrs. Taylor & Mutton, of Saltash, the contractors for the work, which is estimated to cost 1,312l.

**BLIND INSTITUTION, PLYMOUTH.**—The additions recently made to this institution were opened on the 6th inst. They consist of a new wing containing, with other accommodation, a schoolroom 38 ft. by 22 ft., fitted with special desks for the purposes of instruction of the blind. Adjoining it are a matron's room, a cloak-room, lavatory, and other offices, while in the yard to the rear are play-sheds. The floor above has one room 38 ft. by 22 ft., which is expected to accommodate twenty females as a dormitory. Bath-rooms and the usual offices adjoin. The wing is faced on the exterior with Plymouth limestone and Ham Hill stone dressings, and is connected with the older building by an iron bridge, of special service in case of fire. Mr. H. J. Snell, of Plymouth, was the architect.

**GRAMMAR SCHOOL, PAISLEY.**—This school, which was recently opened, contains eighteen class-rooms, of which two are specially fitted for science lectures. There are also music-rooms, a cookery department, rooms for clay modelling, drawing from casts, and for painting, a physical and chemical laboratory, and a large central hall for physical exercises and drill. Within the grounds is a workshop for manual instruction. The school is erected of red sandstone, and has accommodation for 950 pupils in the ordinary class-rooms. Mr. T. G. Abercrombie, of Paisley, is the architect.

**FREE LIBRARY, WICK, N.B.**—On the 5th inst. the new library buildings erected in Wick were



opened by Professor Mason. Their estimated cost is over 4,000l. Messrs. Leadbetter & Fairley, of Edinburgh, were the architects.

**MISSION HALL, FALKIRK.**—On the 10th inst. the memorial stone of the new hall erected for the Town Mission was laid. The hall is situated in Dundee-court, and was erected from plans prepared by Mr. Alexander Gauld, architect, Falkirk, at a cost of 1,650l.

**INFANTS' SCHOOL, YARM.**—On the 12th inst. a new infants' school was opened at Yarm. The architect was Mr. Fletcher, of Stockton.

**LIBRARY BUILDINGS, GLOUCESTER.**—It is proposed to erect public library buildings in Brunswick-road, Gloucester, as an addition to existing technical school buildings. The library will comprise a hall, lending library, reference library, librarian's room, and news room. It is proposed to appropriate the large room formerly used as a museum, but latterly as a technical drawing room for the reference library, and to utilise a small section of it at the west end, together with the waste space beneath the principal stairs to the art school for a librarian's private room. To erect on the south of the reference library a lending library with entrance hall. The lending library to be two stories in height with a large glass dome light over, the upper story having galleries round, and an open centre, and with wall space for a large number of stock and extra books. The galleries to be reached by a staircase direct from the lending library—a book-lift being also provided. Adjoining the lending library, and occupying the whole length of the land on the south side will be the reading and news room, and in the basement accommodation will be provided for extra papers, and stores, cloak-room, lavatories, &c. To compensate for the loss to the school of art of the technical drawing room taken by this scheme for the reference library, additional accommodation for the school of art is to be provided above the free library, viz.:—A lecture-room and technical drawing room over the reading and news rooms, two class-rooms over the new hall, the space over the reference-library to be rearranged to suit the new conditions, but affording as at present a class-room, art master's room, with lavatory and cloak-room. The buildings are estimated to cost about 5,000l. The architects are Messrs. Waller & Son, of Gloucester.

**NEW CHURCH, WESTWOOD, NOTTS.**—The foundation stone of a new church at Westwood was laid recently. The architect is Mr. P. H. Curry, of Derby, and the contractor Mr. W. Salt, Ripley.

**COTTAGE HOSPITAL, SKEPTON.**—Memorial stones in connexion with the Cottage Hospital, which is being erected at the west end of Skepton in commemoration of the Queen's Diamond Jubilee were laid on Saturday last week. The hospital is being erected from the designs of Mr. E. C. H. Maidman, of Edinburgh, whose plans were successful in competition.

**MEMORIAL HALL, BELFAST.**—The foundation stones of the George Thompson Memorial Hall, which is being erected at Belfast, were laid on the 10th inst. The building is being erected at the rear of the Broadway Presbyterian Church, and will be arranged so as to have direct access to it and to adjacent streets. Provision is made on the ground floor for a minor hall, with committee, vestry, and cloak rooms attached. A parlour is also provided; the main hall is 64 ft. by 22 ft. Underneath the eaves of the windows in the front gable a deep panel of stone will bear the inscription, "Thomson Memorial Hall." A date stone occupies the centre space above. The contractor for the work is Mr. Thomas McMillan, and the architects are Messrs. Young & Mackenzie, of Donegal-square East, Belfast.

**CONSERVATIVE CLUB, FARSLEY.**—The cornerstones of a new Constitutional Club at Farsley were laid on the 10th inst. On the ground floor there will be an entrance hall, a reading-room, an assembly hall, &c. A large billiard room for three or four tables, a smoke-room, the secretary's office, and lavatories will be on the first floor. In the basement there are to be two bath-rooms, a large store cellar, a heating cellar, and a kitchen. The architect is Mr. G. C. Gamble, of Bradford, and the contractors are: Mason, Mr. G. A. Walker, Farsley; joiner, Mr. John H. Robinson, Farsley; slater, Mr. Frederick Thompson, Stanningley; plumber, Mr. Edward Pearson, Farsley; plasterer, Mr. Wilfrid Bishfield, Farsley; painter, Mr. H. Grimshaw, Farsley; and ironfounders, Messrs. Whitehead Brothers, Farsley.

**CLUB BUILDINGS, LAURENCEKIRK, N.B.**—New premises are to be erected at Laurencekirk, for the South Kincardine Club. In the designs two shops are provided on the ground floor. The Club premises, comprising billiard-room, reading-room, and library, with lavatory accommodation, are placed on the first floor. The upper floor is utilised for the Club-keeper's apartments. Hard pressed bricks are to be employed. The contractors are:—Bricklayer, Mr. William Anderson, Dundee; joiner, Mr. Alexander Dunbar, Laurencekirk; plumber, Mr. Robert Mitchell, Laurencekirk; plasterers, Messrs. Burns & Son, Montrose; and slaters, Messrs. J. Scott & Son, Montrose and Brechin. Mr. D. Galloway, of Brechin, is the architect.

**HOTEL, MONIFIETH, N.B.**—A hotel is about to be erected on the Links, at Monifieth. It will be built on the south side of a new street to be formed in front of the Panmure Golf Club-house, and will

consist of two stories. On the ground floor will be a large dining-room, drawing-room, tea-room or parlour, public bar, private bar, and a hall 45 ft. by 32 ft., as well as ante-rooms and kitchen. The second floor will consist of a parlour, billiard and card rooms, eight bedrooms, three servants' rooms, and lavatory accommodation. The architects are Messrs. Johnston & Baxter, Dundee.

**NURSES' HOME, GARTLOCH, N.B.**—The foundation stone of the proposed Nurses' Home at Gartloch was laid on the 8th inst. The Home will accommodate about sixty, and is to be of three stories, built of red stone and similar to the main asylum buildings. It is quite detached from the asylum, and situated at a rather lower level. On each floor will be sitting-rooms, bedrooms, and bath-rooms, while in addition on the ground floor will be matron's-rooms, visitors' rooms, and kitchen. A sick-room for invalided nurses will be found on the first floor. To ensure quiet for the night nurses, their quarters, reached by a separate staircase, have been placed in the top flat. The bedrooms will have a separate room. On each floor will be a small kitchen. The entrance to the home is placed so as to be equally convenient for asylum and hospital, and opening from it on one side is a parcel and inquiry room. The parlours, which have large windows, are placed at the corners, and the lavatories and bath-rooms are in the wings. The architects are Messrs. Thomson & Sandilands, and the contractors—masons, Messrs. Paterson & Baldie; joiners, Messrs. Hutchison & Grant; slaters, Messrs. A. M. Ross & Sons; plasterer, Mr. Mackenzie; plumber, Mr. J. L. Arnot; painters, Messrs. McCulloch. The total cost, including furnishings, it is estimated, will be about 20,000l.

**WORKHOUSE EXTENSIONS, PONTEFRAC.**—The vagrant wards, a new lunacy block, and a new laundry department added to the Pontefract Workhouse are now rapidly approaching completion. Altogether the additions will cost something like 10,000l. The new vagrant block contains twenty-seven bed-cells, connected with which are apartments for stone-breaking, and a large shed. Stone-breaking is carried on to a considerable extent in the Pontefract Workhouse, owing to the fact that the Corporation takes the material for road-mending. There are also spacious association wards, in which the casuals who remain there than one night in the house may spend their time when their task is done; and the block is fitted with lavatories, baths, disinfectant, &c., as well as heated by hot water. The new wards for casual females are pretty much on the same plan, all being roomy, light, and airy. In the newly-erected block there are eight cells. The alterations include a new committee-room for the guardians, for which the old tramp ward has been called into service; an extensive laundry; new porter's lodge; and new offices for the Master, the latter commanding a view of the entrance-gate and the task sheds. The architect of the new premises is Mr. J. H. Greaves; the building contract is being carried out by Messrs. Jackson Bros., Goole; and Mr. C. W. King is the clerk of works.

**TRINITY CONGREGATIONAL CHURCH, HESLE, YORKS.**—Plans have been prepared for a new church by Mr. Percy T. Rinton, of Hull, which have been accepted by the Congregational church committee. The estimated cost of the new church is 3,750l., add to this the cost of the land, and the total required outlay will be about 4,200l.

## SANITARY AND ENGINEERING NEWS.

**NEW DISTRICT WATERWORKS NEAR ABERDEEN.**—New waterworks for Waterton District—including the villages of Dyce, Bucksburn, Bankhead, and Stoneywood—near Aberdeen, were opened on the 10th inst. They have been constructed according to plans by Mr. J. D. Watson, County Engineer, Aberdeen. There are 5,000 inhabitants in the district, and the source of supply is a spring at Parkhill, which will yield 200,000 gallons a day in the driest season. The water passes from the intake through a 7-in. cast-iron pipe to a point on the Goval Burn, near Parkhill railway station, whence it is pumped by a pair of horizontal double-acting pumps, driven by two vortex turbine wheels up to a high level cistern about 200 ft. higher than the pumping station, and nearly two miles distant. The cistern is near Dyce quarries, and from this point the water gravitates to the Standing Stones reservoir in a 6-in. cast-iron pipe about a mile in length, for the supply of Bucksburn, Bankhead, and Stoneywood. Dyce water supply is carried from the cistern to Dyce reservoir in a 3-in. pipe. In connexion with the turbine there is a weir on Goval Burn, and for emergencies a tank has been constructed capable of containing seven million gallons of water, equal to more than three days' supply for the pumps. The contractor for the water and sewage works, which together have cost 10,000l., has been Mr. Peter Tawse, Aberdeen, while the pump and turbines have been supplied by Messrs. Carrick & Ritchie, Edinburgh.

**RECONSTRUCTION OF ABERDEEN GRAVING DOCK.**—The Aberdeen Harbour Commissioners have now resolved to reconstruct the dock on its present site; that it be lengthened to 615 ft. by moving the site of

the entrance eastwards to the extent of 75 ft.; that it should be widened and deepened as proposed by the consulting engineer, Mr. H. Wake; that a sliding caisson be adopted for the entrance in place of gates; that the floor of the dock be constructed on a level plane throughout, instead of having a rise of 3 ft.; and that a pontoon dock be provided on the south side of Albert Basin. The total cost is estimated at 125,452l.

**WATER SUPPLY, WISHAW, N.B.**—The water supply to the town of Wishaw having been found inadequate, the burgh engineer has been busy during the past year in reporting on supplies from a number of sources to the Town Commissioners. The *Glasgow Evening Times* remarks that the scheme which has met with most favour, and which the Commissioners decided to adopt, was to take a supply from the Potrail, Potrenick, and Peden streams, which rise on the Lowthers on the boundaries of Dumfriesshire. Parliamentary powers were applied for, and these being obtained, the engineer was instructed to report as to the cost of constructing the reservoir. In his report, which was submitted to a special meeting of Commissioners held on Monday, the 9th inst., the engineer estimated that the cost of carrying out the works, including land, wayleaves, and surface damages, would be as follows:—Reservoir, with 18-in. pipes, 93,000l.; reservoir, with 16-in. pipes, 81,000l.; reservoir, with 15-in. pipes, 78,000l.; and reservoir with 12-in. pipes, 67,000l. Mr. W. R. Copeland, C.E., Glasgow, certified that he had examined the estimates on which the report was based, and considered the amount sufficient. After discussion, it was arranged to proceed with the work at once, and it was unanimously agreed to adopt the 18-in. pipe. This will give a supply of 2,200,000 gallons per day. The works thus authorised are the construction of three weirs—one on the Potrenick Burn, one on the Potrail Water, and one on the Peden Burn—and the laying of three lines of pipes. From the weir on Potrenick Burn a line of pipes is to be led through Crawford, &c., to the existing reservoir of the Commissioners. A branch line of pipes will then be led from the weir on the Potrail Water, and will connect with the main line at a point 20 yds. further west. A short line of pipes will also connect the weir on the Peden Burn with the main line. The Commissioners are also to construct a compensation reservoir to satisfy the claims of millowners, and others interested in the water flowing from the streams. The cost of this is included in the above estimate.

**WATER SUPPLY, LIVERPOOL.**—In view of the scarcity of water in the East End of London, the following particulars showing how Liverpool is being served, in spite of the drought, will be interesting. The report of the Water Engineer as to the distribution of water for the weeks ending the 27th ult. and 3rd inst., and for the corresponding weeks of 1897, within the limits of the compulsory supply (City of Liverpool and out-townships), was as follows:—

Week Ending	From Rivington and Vyrnwy. Gallons.	From Wells. Gallons.	Total Gallons.
August 27, 1898	142,764,000	30,326,000	173,090,000
Corresponding week, 1897	142,654,000	25,740,000	168,394,000
September 3, 1898	137,485,000	30,477,000	177,962,000
Corresponding week, 1897	140,483,000	29,961,000	170,444,000

Rates per head per day on estimated population:—

August 27, 1898	31.63 gallons.
Corresponding week, 1897	30.25 "
September 3, 1898	31.22 "
Corresponding week, 1897	29.18 "

Supply to Chorley and places outside of the compulsory limits:—

Week ending	From Rivington. Gallons.	From Vyrnwy. Gallons.	Total Gallons.
August 27, 1898	10,873,000	665,000	11,538,000
Corresponding week, 1897	10,299,000	514,000	10,813,000
September 3, 1898	11,090,000	554,000	11,644,000
Corresponding week, 1897	10,139,000	510,000	10,649,000

Total quantity supplied, both within and outside of the compulsory limits:—

Week ending	For the week. Gallons.	Average per day. Gallons.
August 27, 1898	190,818,000	27,259,000
Corresponding week, 1897	180,137,000	25,734,000
September 3, 1898	198,700,000	28,658,000
Corresponding week, 1897	174,093,000	24,870,000

## STAINED GLASS AND DECORATION.

**WINDOW, ST. JOHN'S CHURCH, BROOKLANDS, MANCHESTER.**—A new stained glass window has recently been placed in this church. The design is from cartoons drawn by the late Sir E. Burne-Jones, and the window has been completed by Messrs. W. Morris & Co., of Merton Abbey. The design is symbolical of the Ascension. The central light depicts two angels with outstretched wings, above the heads of which is a representation of the risen Saviour. This light is supported on either side by two others introducing figures bearing scrolls with a Latin inscription. Over these panels are circular lights showing the heavenly choir of seraphim, and at the apex of the circular panel is a representation of Christ receiving the faithful into Paradise.



Along the base of the window is a dedicatory inscription.

**MEMORIAL WINDOW, GREAT BRIDGE.**—A memorial window was recently unveiled in Great Bridge Wesleyan Church. It represents the Good Samaritan, and was executed by Mr. Evans, of Smethwick.

### FOREIGN.

**FRANCE.**—A committee has been formed to erect a monument to Chopin in the Parc Monceau at Paris. M. Georges Dubois is the sculptor, and it is intended that the monument should be erected next year. It will consist of an architectural erection against which leans a female figure representing "Music," and supporting a bronze bust of the composer.—Two painters, MM. Olivier Merson and François Flameng, have been commissioned to make the designs for the new French bank-notes.

—A tramway line is shortly to be established from Fontainebleau to Barbizon, across the forest, which it is to be feared will not be improved by this innovation.—It appears that an American Committee has been constituted for the purpose of offering to the French nation a monument in honour of Lafayette to be inaugurated in 1900. It is to be entirely the work of American artists. It may be mentioned that a Committee of American ladies have also undertaken to provide a statue of Washington to be set up in the neighbourhood of the Place des Etats-Unis at Paris.—The Municipality of Pontoise have opened a competition for the designs for a new savings bank.

—The fortifications at Bayonne are to be, for the greater portion at least, demolished.—A rope traction lift or railway is to be made from Lourdes to the summit of the Pic du Grand Jer.—Some excavations undertaken at the ancient monastery of St. Maur de Glanfeuil (Maine-et-Loire) have led to the discovery of the bases of columns of a building of the twelfth century, some pavings of the thirteenth century adorned with fleurs-de-lis, as well as some remnants of a Roman villa.—The jury in the competition for a cattle market at Tours has selected the plans of M. Octave Roy, of Tours.—A statue of the painter Millet is to be inaugurated at Gréville on the 20th.—We hear with regret of the death of the only son of the late M. Charles Garnier, who had been in bad health for some years, and died a month after his father.

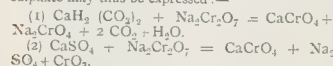
—M. Pierron, "Architecte voyer en chef" to the Municipality of Paris, has died at the age of ninety. As "Ingénieur des Arts et Manufactures" he had collaborated in all the large public works of Paris for some years, as well as in the steel structures for the 1889 exhibition. He directed also the operations connected with the formation of the Rue Reaumur.

**AUSTRALIAN PATENTS.**—A patent granted in New South Wales only, protects the holder or holders within the boundaries of the colony. The period for which letters patent remain in force varies from seven to fourteen years, generally the latter period; but a certificate of provisional protection can, however, only be granted for twelve months from the date of issue. The number of New South Wales letters patent and certificates of provisional protection issued during the last ten years was 7,670; of which 213 were granted in 1897. The fees for complete letters patent are 5*l.*, and for provisional certificates 2*l.*; should the latter be converted into patents within twelve months of issue, the amount is allowed, only 3*l.* additional having to be paid.

### MISCELLANEOUS.

**FONT, ST. MARY'S CHAPEL, ABERDEEN.**—A typical font has just been erected in St. Mary's Chapel, Aberdeen. It stands on a fanning composed of five stories geometrically arranged so as to form a regular octagon. The base and column are circular on plan. The underhalf of the portion containing the bowl is circular, and is worked into an octagonal shape above, with eight sunk panels, which will be filled in with brass work. The font was designed by Mr. W. Kelly, architect, Aberdeen, and the work has been carried out by Baillie Taggart, Aberdeen.

**BOILER INCrustATIONS.**—From Messrs. Peters, Barisch, & Co., Derby, we have received a sample of the chrome salt employed in their patented process for preventing the formation of scale or crust upon the inside of boilers. The salt is bichromate of sodium; it is in the form of hard, red coloured lumps of irregular size, and is readily soluble in water. The reaction of sodium bichromate upon the two most troublesome salts in ordinary boiler waters—viz., calcium bi-carbonate and calcium sulphate may thus be expressed:—



The value of the process is due to the formation of calcium chromate, which is far more soluble in water than either carbonate or sulphate of calcium. It is claimed that the sediment which at length forms, does not attach itself to the sides of the boiler, but can be readily blown out with the refuse water. The quantity of chrome salt required is as

a rule very small, and provided that the chromic acid has no injurious effect upon the boiler there is little doubt that the process will be extensively adopted.

**WATER AND SEWERAGE WORKS, COLERAINE, IRELAND.**—A Local Government Board inquiry was held on the 6th inst., at Coleraine, concerning the application of the Board of Guardians as the Rural Sanitary Authority, for a supplemental loan of 1,600*l.* for Portewart water and sewerage works.

**FREE LABOUR CONGRESS, MANCHESTER.**—The Free Labour Congress, the object of which is to oppose the tyranny of trades-unions over workmen, is to be held at Manchester on October 10. In the annual report of the Executive Council, a copy of which has been sent to us, it is stated that 12,000 workmen have been registered in the books of the Association during the year. Three hundred and twenty employers have made application to the chief and district offices for men, and 13,000 workmen have been sent out, for whom employment has been found. Of these, 9,000 were engaged by the large engineering firms during the late strike.

**"BESTO" GLASS, FOR SKYLIGHTS, &c.**—This is described, in the circular accompanying the specimen sent to us, as "a new product now being manufactured and put upon the market in the United States and Canada"; consisting of plate glass with a mesh of wire covered with asbestos imbedded in it, giving greater strength to the glass, and preventing it falling in any but very small pieces if broken. There is nothing new in the general idea of imbedding wire mesh in glass, however; we noticed a patent glass with wire meshes not very long since. The special feature in the "Besto" glass appears to be the covering of the wire with asbestos before putting it in the glass. This ought to render it more impervious to the action of fire than the bare wire, though we do not notice that any special claim to this effect is made by the patentees in their circular, or indeed any special reason given for introducing the asbestos at all; but we presume that is the reason. It might also prevent the cracking of the glass, to some extent, owing to very rapid variations in temperature, the asbestos acting as a sort of buffer. It is an improvement, no doubt on the plain wire mesh; and that is the chief novelty.

**BROOK HOSPITAL: INQUIRY TO BE HELD.**—At an ordinary meeting of the managers of the Metropolitan Asylums District, held at the offices of the Board, in Norfolk-street, Strand, on Saturday, the 10th inst., a letter from the Local Government Board was read, stating that they had directed their chief general officer, Mr. W. E. Knollys, C.B., to hold, after the vacation, an inquiry into the causes of the excess of cost over the tenders received for the erection, &c., of the Brook Hospital, the architect's responsibility, and the supervision exercised by the committee and the managers as regarded expenditure.

**BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION.**—The first and statutory meeting of the Brickmasters' Employers' Liability Association Limited, was held at the Cannon-street Hotel on August 30, Mr. Wragge (of Messrs. Eastwood & Co.) in the chair. The notice convening the meeting having been read, and the register of members laid on the table, the report of the Directors was read as follows: "Our Directors have pleasure in reporting that the Association has been duly registered as a company, limited by guarantee, and is now fairly established. All the principal stock-brokers in Kent, Essex, and Middlesex have become members, and other classes have been opened for insurance against risks in fire-getting, barge-building, machine and red brick making, as well as a class for lime, cement, and brick merchants at rates calculated to cover their risks. The amount of wages upon which insurance has been effected with the Association is now 350,000*l.*, and is being increased week by week. A draft of special rules or by-laws for observance by members has been framed and is now engaging the attention of the Board; when approved, copies will be forwarded to members. Members are requested to give immediate notice to the Secretary in the event of an accident occurring to any of their workpeople. The services of Dr. Burnett, of Highgate, have been secured as medical adviser to the Association. A call has been made to meet the expenses of establishment and to provide a balance in hand. In accordance with the articles the Directors retire. They offer themselves for re-election. It was resolved that the report be received and adopted; and that Messrs. Robert L. Curtis, Charles Cremer, George H. Dean, Edward William Goodenough, Alfred J. Knight, Henry Packham, Algeon Rutter, John Willson, and George Edward Wragge be re-elected Directors of the Association. Messrs. D. Willis, R. Featherby, and Koshier were nominated as the Audit Committee. A vote of thanks to the Chairman concluded the proceedings.

WE learn that Mr. R. O. Wynne Roberts, of Oswestry, has been appointed City Engineer and Surveyor of Cape Town, at a salary of 800*l.* per annum. Mr. Roberts, who is thirty-five years of age, was for seven years Assistant Town Surveyor of Llandudno, five years Borough Surveyor of Carnarvon, and four years Borough Surveyor of Oswestry.

INSTITUTIONS FOR TECHNICAL EDUCATION.—We

have before us the programme for 1898-9 of the Northampton Institute, with classes for mechanical engineering, workshop drawing, practical design of machinery, mechanical laboratory, practical plumbing, brick-cutting, and plastering, drawing and design, goldsmith's work, electrical engineering, &c. The City of London College sends its prospectus of lectures in the Engineering Department by Mr. Henry Adams, including technical drawing and construction, building construction, civil and mechanical engineering, quantity surveying, &c. The Battersea Polytechnic is starting classes in mason's work, under the direction of Mr. John Wornell, intended to give practical instruction to apprentices and artisans engaging in mason's work, including the application of descriptive geometry to mason's work, the making of working drawings, and setting out and executing the work in stone. The Aldenham Institute, St. Pancras, announces classes in building construction, carpentry and joinery, plane and solid geometry, and drawing.

**PUBLIC WORKS, CARDIFF.**—A Local Government Board inquiry has been held at Cardiff regarding an application made by the Cardiff Town Council for the loan of 25,000*l.* for the purpose of paving Butte-terrace, Adam-street, and part of the Penarth-road with hard wood, and also a number of streets, crossings, and the relaying of footways of certain streets.

**ELECTRIC LIGHTING, KING'S LYNN.**—On the 7th inst. a Local Government Board inquiry was held at the Town Hall, Lynn, relative to the application by the Town Council for sanction to borrow 30,000*l.*, for purposes of electric lighting, and 820*l.* for the construction of a bridge and for widening the road at the south gates. Professor Robinson explained his plans for the electric lighting installation at considerable length, and gave it as his opinion that it would be a commercial success.

**SUSPENSION OF BUILDING OPERATIONS IN ABERDEEN.**—Up to Monday last, 480 men, were directly affected by the quarry strike and lock-out, and on that day the Aberdeen Master Masons' Association resolved to suspend all their employees, except apprentices and foremen, until the quarry dispute is settled. This resolution was arrived at in view of the difficulty of procuring a sufficiency of material. As building has been exceptionally active, it is not considered possible that the suspension can last long.

### LEGAL.

#### CASE UNDER THE LONDON BUILDING ACT, 1894.

##### INFERIOR MORTAR.

At the North London Police-court, before Mr. d'Eyncourt, Mr. W. E. Stevens, contractor, of Bridge-street, Homerton, was summoned by Mr. Alexander Payne, District Surveyor of East Hackney (South) and North Bow, on the 9th inst., for building houses at Retreat-place, Homerton, of inferior mortar not in accordance with the By-laws made by the London County Council.

Mr. Payne stated that he had received notice from Mr. Stevens for the erection of nine dwelling houses, and four were already nearly constructed; the defendant had removed large quantities of good sand (presumably from the defendant's quarry), and used the inferior sand, partly mixed with clay matter, in these houses. He had frequently warned him about it, and served him a notice of irregularity on June 15. As there was no material improvement a summons was taken out on August 26. It was shown by the correspondence that Mr. Stevens had complained of the District Surveyor being too sharp on him, and had submitted the material to his own surveyor; but it was admitted that his own surveyor could not approve of the material as being in accordance with the By-laws. On this Mr. Stevens requested that the summons might be withdrawn, but this the Surveyor declined to do.

The defendant was represented by Mr. Romaine solicitor, but no evidence was called and the facts as stated were not controverted.

The Magistrate said that only one summons had been taken out, on which he should certainly inflict the maximum penalty under the By-laws of 5*l.* and costs. If a summons had been taken out on each house he should have inflicted a similar penalty in each case, as it was evident the defendant had been making a considerable profit by using inferior materials, and different to what he professed them to be, in the mortar.

#### INJURY TO A BUILDING AT BRISTOL BY ALLEGED VIBRATION.

THE case of Beake v. Richards came before Mr. Justice Phillimore, sitting as a Vacation Judge, on the 14th inst., on the application of the plaintiff to restrain the defendant by injunction from working a saw mill at Bristol so as to cause injury to the plaintiff's house by reason of noise and vibration.

Mr. Alexander, Q.C., for the plaintiff, said that on behalf of his client a course had been suggested, and which it was thought would practically remove the cause of complaint, but this course the other side did not see fit to adopt. The plaintiff's surveyor had seen the *locus in quo*, and had made an affidavit, in which he estimated the cost of alteration at about 250*l.*



His Lordship said that he had read the affidavits which had been filed, and that something more had been done than had been done there must be an injunction and an acceleration as far as possible of the trial of the action. If the matter could not be expedited that day he proposed to expedite the trial, but he wished as little as possible to adjudge the final result. There was very strong evidence, both positive and negative, but his impression on the balance of the affidavits was at present that there was sufficient noise and vibration to cause serious discomfort to the plaintiff and he should not allow the motion to stand over unless something could be done to reduce the vibration and noise.

Mr. Everitt, Q.C., referred, on behalf of the defendant to the affidavits of the surveyors who had inspected the place. The learned counsel said that the plaintiff carried on the not very quiet business of a furniture remover, and the question was whether, having regard to the surroundings, the plaintiff was entitled to an injunction—whether the noise and vibration was such as to amount to a nuisance—and that had to be tested in the ordinary way and not upon affidavits.

His Lordship said the plaintiff's case was that the defendant's place made a horrible noise, and that the plaintiff's wife had, through that original wrong-doing, got into a very nervous condition. Counsel, however, need not trouble about the doctor's evidence; he (Mr. Justice Phillimore) was troubled more about the evidence of the engineer and surveyors.

Mr. Everitt submitted that the case was one in which the alleged nuisance should be determined before an injunction was obtained, and the rules afforded his lordship a discretionary power in such doubtful cases. The defendant had disconnected from the wall all the shafting except one part, and this he was willing now to disconnect, and when that was done he was instructed that the nuisance would be sensibly reduced.

His Lordship suggested to counsel that there should be an order restraining the defendant from working his saw mill at all until he entirely detached all the connections with the bearings on the party wall so as to get rid of the vibration, and until he had boxed up the engine so as to reduce the noise.

Mr. Alexander said he must ask for his strict rights in this case.

His Lordship said that people sometimes insisted upon their strict rights and did not get them, and suggested that the defendant should detach all bearings and run up a temporary wooden partition between the plaintiff's walls and his. If the defendant was disposed to remove his saw 18 ft. from plaintiff's premises and put up the temporary partition between the side of his engine touching the plaintiff's stables, and all bearings, roof the engine house, which was not roofed, so as to be entirely boxed in, his inclination was that that would be sufficient until the trial. He should keep the plaintiff's motion standing over with liberty to replace it in the event of the alterations not being satisfactory or an arrangement come to.

Mr. Everitt observed that in the meantime, if the defendant found he could comply with the recommendations of the plaintiff's surveyors for the removal of the engine-house, an end might be made of the action, the defendant paying the costs.

Mr. Alexander said that an inquiry as to damages might be necessary.

His Lordship: That will be a matter for you to discuss among yourselves. All I do is to restrain the defendant from working unless he does what the plaintiff's surveyor advises, or what I have suggested.

#### BREACH OF BUILDING COVENANTS.

The case of Priestman v. Oxley and Another came before Mr. Justice Phillimore, sitting as a Vacation Judge, on the 14th inst., on the application of the plaintiff to restrain by injunction the breach of certain building covenants contained in the lease of a certain house and shop in Bradford.

Counsel for the plaintiff stated that, by consent, the motion would be treated as the trial of the action, the defendants being restrained perpetually in the terms of the notice of motion, with costs.

#### ALLEGED OBSTRUCTION OF ANCIENT LIGHTS

The case of Coles and Others v. Salters' Company, which is a motion by the plaintiffs for an injunction to restrain the defendants from the erection of buildings so as to obstruct the plaintiffs' ancient lights, was again mentioned to Mr. Justice Phillimore, sitting as a Vacation Judge, on the 14th inst.

Counsel for the plaintiffs stated that his Lordship on the 7th inst. allowed the case to stand over until that day in order that the defendants might file affidavits, but up to 7.30 on the previous night he (counsel) had not seen them. In consequence of this it was necessary for him to ask that the case might be allowed to stand over for another week, but the defendants had already stated that they would continue building at their peril.

His Lordship said that the defendants were clearly building at their peril, and made the order asked for.

#### ALLEGED OBSTRUCTION OF LIGHT AND AIR.

THE case of Warton v. Poultier, Limited, and Others, again came on before Mr. Justice Phillimore sitting as a Vacation Judge, on the 14th inst., on the application of the plaintiff, Mrs. Warton, the tenant of certain cottages in Collingwood-street, Westminster, for an injunction to restrain the defendant from erecting some stables, 40 ft. high, so as to obstruct the light and air coming to certain windows in the plaintiff's premises.

The defence substantially was that there was no obstruction.

His Lordship, in the result, granted an injunction in the terms of the notice of motion until the trial, the action to be set down at once without pleadings, the costs to be costs in the action.

#### MEETINGS.

SATURDAY, SEPTEMBER 17.

Dundee Institute of Architecture.—Excursion to Loch Leven, Kinross House, &c.  
Northern Architectural Association.—Visit to Jesmond Dene House.

WEDNESDAY, SEPTEMBER 21.

Institution of Builders' Foremen and Clerks of Works.—Ordinary Meeting, 8 p.m.

SATURDAY, SEPTEMBER 24.

Institution of Junior Engineers.—Visit to Sir David Salomon's Laboratories. Leave Cannon-street at 1.35 p.m.  
British Institute of Certified Carpenters.—Visit to Eton and Windsor.

#### RECENT PATENTS.

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until October 24.

18,977. 16,900.—METHOD FOR THE GRIPPING OF SCAFFOLDING, LADDERS, &c.: A. G. Thomas.—As an improvement of the existing method of lashing, the invention fixes a length of chain at each end of a wire rope, a hook is fastened to the end of one of the chains, and has its free end lengthened for leverage; the fastening is effected by taking one lighter, or more, around the ladders, poles, or scaffolding, drawing the rope taut, passing the hook through a link of the other chain, and passing the hook's end through a loose link on its own chain.

19,135.—SEWER INTERCEPTOR FOR PREVENTION OF BACK-FLOW OF STORM WATER FROM SEWERS INTO HOUSES ON LOW LEVELS: J. A. Wallis & C. E. Standing.—The interceptor trap encloses a copper ball which floats on the water in the house side of the trap, and in the event of back-flow of sewage from the main sewer rises in the direction of the fresh-air inlet until it rests against the drain inlet from the house which is provided with india-rubber or composition seating, so as to form a check to any back-flow; the ball is inserted through a removable cover in the inlet side of the trap, which can also be used as a cleaning eye, it does not obstruct the ordinary flow of soil as the trap has the same area, after the ball is inserted, as has any other part of the drain; the trap is put in the manhole close to the main drain, leaving the remaining drain pipes from the manhole to house connections as a reserve for any soil or rain water that may accumulate whilst the main drain is overcharged.

19,173.—SHEET ROOFING: L. Quilliu.—The invention consists in "a new system of sheet roofing which can be put on easily, quickly, and with security without any folding or soldering." To that end is employed the alternate arrangement of a positive covering sheet and a negative or shooting-over sheet in one row, the trapeziform sheets being provided with re-curved borders and joined together in an opposite direction, so that they complete themselves respectively: the sheets have bulging for their stiffening and other purposes.

21,009.—JOINTS FOR DRAIN PIPES AND SIMILAR ARTICLES: A. Johnson. Each drain pipe is fashioned with a spigot end and a socket end. A rabbit of rectangular section is formed in the spigot, and a similar rabbit is formed in the socket. On bringing two ends together an annular cavity is made, to be filled with cement poured through holes made through the pipes.

18,981. 5,104.—ROAD SCARIFIERS: R. Bonford, B. Bonford, & H. Everist.—The several claims comprise (a) a tool carrier or frame, provided with tools or tines, and pivoted to a shaft supported, forwardly, by a regulating wheel which follows the undulations of the ground's surface; (b) the employment of springs interposed between the shaft or axis and its connections with the road locomotive or traction engine; (c) springs arranged to encircle respectively the pin or similar connections between the engine and the shaft, with unannealed and shackles; (d) a hanging strut-leg or frame, which trails idly along the ground when the engine is moving forward, but when the engine begins to move backwards, raises the scarifier to a height as to take the tools out of the ground, and causes a pin on the frame to engage with a catch or hook on the engine; and (e) the employment, in conjunction with reversible and taper-ended tools, of tool holders having taper or conical seatings for taking the end thrust of the tools.

8,226.—MANUFACTURE OF ARTIFICIAL STONE AND CONCRETE: L. P. Ford & T. W. Barber.—The inventors' object is to remove air from the material before it is shaped in the moulds, to facilitate the setting process, and accelerate the drying and indurating of the stone; lime and sand are the materials used, with which is combined from 5 to 10 per cent. of a dry powdered alkaline silicate or similar chemical compound; the moulds, when filled, are placed within a vessel, capable of withstanding considerable pressure, which is hermetically sealed, the air is then exhausted, and hot water admitted, after which steam is admitted and the water is allowed to escape, for a short time; for small blocks the dry mixed materials in the moulds may be subjected to a vacuum for about an hour, then to the action of hot water, under a pressure of three or four atmospheres, for the same period, and then after expulsion of the water to steam at a pressure of four to

five atmospheres for about five hours, after which the steam is shut off and a vacuum created again, the closed vessel being kept the while at a suitable temperature by a steam coil or jacket.

12,009.—A PLASTER OR CEMENT FOR COVERING ROOFS AND WALLS OF BUILDINGS: J. Goodwin, jun.—The composition consists of an admixture of ground clay (seven parts), china clay (three), fossil-meal (two), asbestos (two), blue lias lime (ten), and flax or other fibre (two); it is claimed to be specially suitable for covering wooden and iron buildings in tropical countries, and is sold in a dry state.

14,103.—A LEVEL CLINOMETER, OR PLUMB RULE: G. A. Hill & J. Kackelmann.—In the interior of a straight edge or rule is placed a casing for the indicating device, which consists of a pendulum screwed on to a spindle, with a hand or pointer that moves over graduations on the dial, and is also secured to the spindle.

15,542.—PROTECTION OF WATER, SEWAGE, AND OTHER PIPES AND TRAPS FROM FROST: J. Archibald.—The pipe or trap to be protected is placed within a case or casing, the intervening space is packed with ground cork, rock sawdust, &c.; for pipes below the ground, or where a metal casing would be liable to rust or corrode, the outer casing may be of wood.

15,545.—PARALLEL RULER: A. Hill & J. Tatlock.—The ruler comprises three flat parallel bars, a, b, and c, and two pairs of parallel links, d, e, which connect the three bars together by studs n, o, and p, so that the bars a and c open and close parallel-wise; two curved connecting links are also jointed at their left ends to studs n and o, and at their other ends, on the stud or pin p, set and sliding in a slot in the bar b and a plate affixed thereto; a set pin and nut v slide in the slot, and may be clamped any distance from the stud p, so as to regulate its travel; thus by means of the nut v the ruler can be set to open to only a prearranged extent, and sectional or other equidistant parallel lines may be drawn.

#### NEW APPLICATIONS.

August 27—September 3.

18,461. R. Thom, Lincoln and other Floor Coverings.  
18,462. B. Naylor, Chimney Top and Ventilator.  
18,463. L. N. Bamber, Casements.  
18,475. T. A. Edison, Electrical Meters.  
18,481. J. Steiger, Cement.  
18,487. Von Berks & J. Kenger, Composite Plates of Lead, &c.  
18,493. D. A. Lonsy, Heating Stoves.  
18,501. A. E. Greville, Hot-air Bath.  
18,510. Gouy & Ribet, Hinges.  
18,514-5. W. G. Potter, Gas Burners and Gas Generators.  
18,523. J. Shanks, Discharge Apparatus for Water-closet and other Cisterns.  
18,533. C. Harrison, Reversible Sliding Windows.  
18,543. Billie & Drivet, Acetylene Generators or Lamps.  
18,550. F. W. Smith, a Bolt.  
18,560. A. J. Elliott, Device for Use with Blind Cords, &c.  
18,563. E. W. Clement, Measuring Devices for Supply Tanks.  
18,566. G. Nuttall, Electrical-light Fitting.  
18,574. H. Ralfe, Lock Guards.  
18,575. Edwards & Frazer, 18,581. Quanten-Moens & Carver-Dilger, 18,741. F. G. Wilson, and 18,735. E. S. Bond, for Generating and Burning Acetylene Gas.  
18,582-3. B. G. Lamme, Induction Motors.  
18,586. D. Ward, Hydro-carbon Burners.  
18,594. F. H. Merrill, Pumps.  
18,597. G. H. Hope, Smoke Consumer and Fuel Economiser.  
18,611. G. Couens, Circular-saw Guards.  
18,614. J. Johnson, Gully or Stench Traps.  
18,616. J. S. E. Lumsden, Automatic Pumphill Machine.  
18,619. T. Boustead, Combined Fender and Fireguard.  
18,621. H. Wilkinson, Parallel Rulers.  
18,629. W. W. Martin, Electrical Contacts.  
18,631. D. Small, a Dialectometer.  
18,637. J. Shanks, Moulds for Casting Baths, Cisterns, Tanks, &c.  
18,647 and 18,654. J. Steiger, Process and Material for Moulding Articles: Hydraulic Cement.  
18,658. W. Best, Miners' Safety Lamps.  
18,665. Adie & Roberts, Lamps for Heating and Lighting.  
18,671. G. A. Filters.  
18,674. Cook & Others, Wire-fence Machines.  
18,689. S. Grossiord, Artificial Stones.  
18,699. J. F. Wiles, Measuring Apparatus.  
18,702. Schauschiff & Hodgson, Electricity Accumulators.  
18,713. W. Milroy, Ring for Pipe-joints.  
18,719. A. R. Pollard, for Securing Roofing Slates and Tiles.  
18,729. Enamelled Cloisonné.  
18,732. J. Sossick, Fire Extinguisher.  
18,740. Siemens & Halske A. G., Safety Fuse for Electrical Installations.  
18,742. R. Leignon, Cordless Electrical Machine.  
18,764. W. E. Langdon, Sash Fasteners.  
18,768 and 18,770. Riley & Kershaw, Oxygen Gas Generators and Gas Holders.  
18,773. W. M. MacFarlane, Rock Drills.  
18,781. G. A. Vio, a Ventilator for Buildings.  
18,782. J. G. Cooper, Measuring and Drawing Compasses.  
18,796. Corby & Others, Working, Shaping, and Moulding Plastic Substances.  
18,806. A. Graham, Telephonic Apparatus.  
18,809. Bjornstad & Others, Hydraulic Cranes, Hoists, and Lifts, with Indicating and Recording Apparatus.  
18,810. Mary Evans, Baths.  
18,815. A. J. Collins, Drain Tests and Drain Testing.  
18,849. E. F. Smart, Continuous Wire Drawing.  
18,877. M. E. Fuld, Electrical Batteries.  
18,849. J. Taylor, Measuring Rules.  
18,860. A. Mauser, Bars, Fences, Lattice-work, Fillings, &c., and their Manufacture (without waste) from Strip or Band Steel.  
18,864. A. H. Alderman, Cleaning and Cleansing Wall Papers, Frescoes, Water-colour Ceilings, &c.  
18,870. T. H. Cobley, Coloidal Tannates as Boiler Disincrustants.  
18,883. A. Rodriguez, Liquid, Grain, and other Elevators.

#### SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

August 31.—By Messrs. SPELMAN (at Norwich).  
Norwich, Norfolk.—87, Waterloo-rd. and the Waterloo Stores (with off license), ut. 49 yrs., g.t. 17. 5s., f. 272. 75s. £1,100  
61 to 85 (odd), Waterloo-rd., ut. 49 yrs., g.t. 54. 15s. 1,745  
1, 3, 5, and 7, Traverse-st., ut. 49 yrs., g.t. 17. 18s. 340  
September 2.—By WAGSTAFF & SONS.  
Holloway.—49, Hampden-rd., ut. 64 yrs., g.t. 1. 28s. 205  
September 1.—By WILLSON & PHILLIPS (at Rochford).  
Shopland, &c., Essex.—Shopland Hall Manor Farm, 140 a., f. 1,000 6,000  
Ashington, Essex.—Ashington Hall Farm, 30 a. 2 r. 3 p., f. 2,550  
Enclosures of land, 43 a. 0 r. 4 p., f. 500  
Little Stanbridge, &c., Essex.—Enclosures of land, 30 a. 2 r. 28 p., f. 500



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Extension of Covered Market .....	Aberavon Corp. ....	20 guineas .....	Dec. 1

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. as Supplied by	Tenders to be delivered
Additions to Schools, Nactonmoel . . .	Llandysfodwg Sch. Bd.	J. Rees, Architect, Pantre, Glan.	Sept 30
Two Houses, Marine-parade North, Great Yarmouth . . .	J. Powell . . .	C. Baker, Architect, Town Hall, Brighton.	do.
Miller Beds, Sewage Works . . .	Nelson (Lancs) Corp.	R. Baker, Esq. Boro. Engr. Town Hall.	do.
Rebuilding Business Premises, Aber- ystwyth . . .	City of Aberystwyth	Swash & Baid, Architects, Aberystwyth.	do.
Laying Pipes, Water-works . . .	Bantry (Ireland) Union	W. J. M. O'Leary, Boro. Engr., Bantry.	do.
Relaying Paving, &c. Bell-street . . .	Tyneham Corp.	J. F. Bantilla, Boro. Engr. Town Hall.	do.
Schools, Rhymney, &c. . .	Bedsleyth Sch. Bd. . .	C. E. B. Burgess, Esq., City Engr. Municipal Council.	do.
Electric Traction Plant . . .	Ledsa Corp.	J. H. B. Burgess, Esq., City Engr. Municipal Council.	do.
Manse, Caledon, Ireland . . .	Presbyterian Church Committee . . .	Young & Mackenzie, Archi- tects, Glasgow.	do.
Public Houses, Becho, Bowery Bridge, York . . .	Liverpool Corp.	H. Mitchell, Architect, Worley Town, Newcastle-on-Tyne.	do.
Water Wash-house, Stables-street . .	Amble R.D.C. . . .	W. R. Court, Esq., Ker- sey, Newcastle-on-Tyne.	do.
Private Streets Works, Althorpe, &c. .	South Shields Corp.	W. Gibbons, Esq., 31, Queen Street, Althorpe.	do.
Wood and Granite Paving, Mill Dam, Newcastle-on-Tyne . . .	South Shields Corp.	B. E. Burgess, Esq., Chapman row, Newcastle-on-Tyne.	do.
Enlargement of St. John's Church, Chapeltown, Rhymney . . .	Leishan B. of W. . .	Land, near Barnsley . . .	do.
Road making and Paving Works . . .	Fulham Vestry . . .	The Surveyor, Town Hall.	do.
*Flagging Dames road . . .	Fulham Vestry . . .	C. Bottenhill, Town Hall, Newcastle-on-Tyne.	Sept 21
Alterations to Hospital . . .	Hillmorth Corp.	G. D. Bellamy, Esq., 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000	

## CONTRACTS—Continued

[illegible]

## PUBLIC APPOINTMENTS

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Secretary and City Manager for Water-works .....	York Waterworks Co.	\$67. 8. ....	Srit. 23
*Architectural Assistant .....	Let. and C. C.	100. rising to 200. per week	5th Oct.
*Chief Clerk of Works .....	Chas. & Bowdler & Co.	100. rising to 200. per ann.	23rd Oct.
*Two Inspectors (Electricity) .....	Chesney & Veary .....	120. rising to 120. per ann. each	23rd Oct.
*Boys Engr. & General Assistant .....	Plymouth Coy. ....	100. rising to 136. per ann.	Srit. 23

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, viii, ix, & xix. Public Appointments, pp. xvi, & xi



September 3.—By Messrs. SWELMAN (at Norwich).  
Wymondham, Norfolk.—Dykebeck Farm, 112 a.  
3 r. 26 p., f. and c.—..... £1,000

September 5.—By WHITE & SONS.  
Leatherhead, Surrey.—Highest, The Swan Hotel,  
oct. 60 yrs., r. 100f., with goodwill..... 13,300  
By REBBECK BROS. (at Bournemouth).

Bournemouth, Hants.—1 and 2, Granville Villas,  
3, Granville, and seven residences adjoining, f.  
r. 36d., ..... 6,300  
Alton Chine-d., Gloucester and Wilton House,  
f. r. 175d., ..... 2,450  
1 and 2, Cheltenham-villas, f. r. 65d., ..... 1,175  
Brankomester (near of), three cottages, work-  
shop, &c., ut. 8 yrs., g.r. 10d. 10s., r. 65d., ..... 1,775  
1, 2, and 3, Myrtle-cottages, ut. 70 yrs., g.r.  
6d., f. r. 75d., ..... 1,250  
1 and 2, Brankomester-cottages, ut. 77 yrs., g.r.  
6d., f. r. 75d., ..... 500  
3 and 4, Osmond-cottages, with smithy, &c., ad-  
joining, ut. 88 yrs., g.r. 6d., f. r. 65d., ..... 850  
1, 2, and 3, Warmwell-cottages, f. r. 40d., ..... 550  
Pole, Dorset.—12 and 14, Kingland-pl., 1 and 2,  
Laburnum-cottages, and 2 to 4, Exeter-  
cottages, ut. 34 yrs., g.r. 1d. 11s. 6d., ..... 700

By STEPHENSON & ALEXANDER (at Cardiff).  
Cardoxton, Glamorgan.—Guy's-rd., the Barry Dock  
and District Steam Laundry, with goodwill,  
ut. 98 yrs., g.r. 17d., ..... 1,975  
September 6.—By Messrs. R. & R. R. R.  
Lewisham.—Dermody-rd., Cambridge House, ut. 8  
yrs., g.r. 7d. 10s., r. 33d., ..... 225  
By RUTLEY, SON, & VINE.

Stockwell.—50, Stockwell Park-rd., ut. 27 yrs.,  
g.r. 10d., f. r. 46d., ..... 205  
Clintons Town.—87, Harwood-st., c. r. 34d., ..... 10  
Hamstead-rd.—29, Harrington-rd., ut. 44 yrs.,  
g.r. 11d., f. r. 70d., ..... 635  
Highbury.—Highbury-cres., f.g.r. 45d., reversion  
in 99 yrs. (at Lewes), ..... 1,250

By STEPHENSON & ALEXANDER  
(at Cowbridge).  
Llaneror, Glamorgan.—Two freehold fields,  
7 a. r. 24 p., ..... 410  
The Windmill Farm, 235 a. or 23 p., f., ..... 3,150  
The Llaneror Court Estate, 409 a. 3 r. 20 p., f., ..... 12,000  
Enclosure of land, 94 a. or 21 p., f., ..... 2,500  
Cae Craig lands, 4 a. 2 r. 20 p., f., ..... 200  
Penlline, Glamorgan.—A freehold field, 7 a. or  
14 p., ..... 240  
The Ffela Farm, 18 a. or 25 p., f., ..... 550  
Llanbleddan, Glamorgan.—The Upland Farm,  
82 a. 3 r. 6 p., f., ..... 2,100  
Colwinstone, Glamorgan.—Golden Mile Farm,  
25 a. 1 r. 14 p., f., ..... 1,500

By BEAN, BURNETT, & ELDRIDGE (at  
Lewes).

Lewes, Sussex.—Prince Edward-rd., freehold  
rent charges of lot. 14s. 6d., ..... 275  
By SOUTH & WILKINSON (at Tean).

Tean, Staffs.—High Fields Farm, 95 a. 2 r. 11 p.,  
f., ..... 4,225  
Spitchell's Field, 3 a. or 21 p., f., ..... 310  
Two cottages and gardens, f., ..... 415

By HAMPTON & SONS (at Lewes).  
Hailsham, &c., Sussex.—Magham Down Farm,  
77 a. 3 r. 3 p., f., ..... 1,135  
A freehold cottage and 2 r. 7 p., f., ..... 170  
Amberstone Farm, 16 a. or 3 r. 9 p., f., ..... 2,110  
Hailsham, Sussex.—Two cottages and enclosures,  
34 a. or 10 p., f., ..... 710  
Enclosure of land, 94 a. or 21 p., f., ..... 2,500  
Hailsham, Sussex.—Cottages, enclosures,  
30 a. 3 r. 5 p., f., ..... 700  
Enclosure of land, 16 a. 1 r. 28 p., f., ..... 600  
Holmsham Farm, 18 a. 3 r. 25 p., f. and c., ..... 1,500  
Framfield, Sussex.—Two cottages and enclosures,  
84 a. f. and c., ..... 1,500  
Hove, Sussex.—Spray's Farm, 35 a. or 30 p., f., ..... 340  
Wartling, Sussex.—Carter's Corner Farm, 45 a. 1 r.  
11 p., f., ..... 1,010  
Chiddingly, Sussex.—Swansbrook Wood, 31½ a., f., ..... 220

September 7.—By DOUGLAS YOUNG & CO.  
Lewisham.—Morley-rd., &c., i.g.r. 91d. 10s., ut.  
80 yrs., g.r. 6d., ..... 1,200  
Wandsworth.—111 and 113, The Grove, f. r. 95d., ..... 1,120  
Lambeth.—16 and 18, Westminster Bridge-rd.,  
ut. 203 yrs., g.r. 12s., c. r. 150d., ..... 40

By P. & G. GIBEN.

Hammersmith.—65, Rednal-ter, ut. 81 yrs., g.r.  
5d., ..... 205  
Pentonville.—1, Southern-st., r. 77d.; also i.g.r. 9d.,  
ut. 274 yrs., g.r. 1d., ..... 900

By H. J. CHEFFINS (at Masons' Hall Tavern).  
Roxford, Essex.—The Eagle b-h. and o a. 2 r.  
25 p., f., ..... 1,000

September 8.—By H. S. R. STANFORD (at Hales-  
worth).

Spexhall, &c., Suffolk.—Girling's Farm, 81 a. or  
33 p., f., ..... 750

By FRANCIS & CO.  
Stockwell.—65, Sunney-rd., ut. 83 yrs., g.r.  
8d. 10s., f. 45d., ..... 500

By NOXES & NOXES.  
Forest Hill.—2, Comoro-rd., f. r. 28d., ..... 310

By WYATT & SON (at Chichester).  
Chichester, Sussex.—York-rd., freehold house and  
two cottages, ..... 630  
21 and 23, St. James-rd., f., ..... 160

Contractions used in these lists.—F.g.r. for freehold  
ground-rent; i.g.r. for leasehold ground-rent; i.g.r. for  
improved ground-rent; g.r. for ground-rent; r. for rent;  
f. for freehold; c. for copyhold; l. for leasehold; e.r. for  
estimated rental; u. for unexpired term; p.a. for per  
annum; yrs. for years; st. for street; rd. for road; sq. for  
square; f. for fence; ter. for terrace; cres. for crescent;  
yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.			TIMBER (continued).		
Greenheart, E.G.	ton	8/10 0/0	Satin, Porto Rico	0/10 0/0	0/10 0/0
Teak, E.I., lead	10/10 0/0	12 10/0	Walnut, Italian	0/10 0/0	0/10 0/0
Sekoula, U.S.A.	0/10 0/0	0/10 0/0	METALS.		
Ash, Canada, load	4/10 0/0	5/10 0/0	Iron—Fig. in Scot.	0/10 0/0	0/10 0/0
Elm, do.	4/10 0/0	5/10 0/0	Land, Welsh, in	0/10 0/0	0/10 0/0
Fir, Danic, &c.	4/10 0/0	5/10 0/0	Do. do. at works	5/10 0/0	5/10 0/0
Canada, do.	4/10 0/0	5/10 0/0	Do. in Wales	5/10 0/0	5/10 0/0
Pine, Canada, red	4/10 0/0	5/10 0/0	Do. in Staffordshire	6/10 0/0	7/10 0/0
Do. yellow	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Lath, Danic, fath	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
St. Petersburg	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Wainscot, Riga	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Oak, log	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Oak, sawn	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Deal, Finland	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 4th & 3rd	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 2nd	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 1st	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 1st yellow	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 2nd yellow	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. white	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Sweden	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
White Pine	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Canada, Pine	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. do. and road	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. do. and	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. Spruce, 1st	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 2nd and	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Do. 3rd and	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
New Brunswick	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Baltics all kinds	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Flooding boards	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
sq. ft. prep.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Other qualities	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Cedar, Cuba, r.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Honduras, &c.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Mahogany, Cuba	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
St. Domingo	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Carage av.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Mexican, do.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Tobacco, do.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Honduras, do.	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Ros, Turkey, ton	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Ros, Rio	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Bulls	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0
Satin, St. Domingo	4/10 0/0	5/10 0/0	Do. in London	6/10 0/0	7/10 0/0

TENDERS.

[Communications for insertion under this heading  
should be addressed to "The Editor," and must reach us  
not later than 10 a.m. on Thursdays. N.B.—We cannot  
publish Tenders unless authenticated by the name and  
address of the tenderer; and we cannot publish announce-  
ments of Tenders accepted unless the amount of the Tender  
is given, nor any list in which the lowest Tender is under  
£100 unless in some exceptional cases and for special  
reasons.]

ANNFIELD PLAIN (Durham).—Accepted for the construction  
of conveniences for the Urban District Council. Mr. T. J. Town-  
dale, surveyor, 10, Central Office, Annfield Plain.—..... £107 7 9

Belvedere, Kent.—For erecting two small houses,  
providing drainage to laundry, &c., for Mr. Wm. Smith. Mr. John  
H. Wills, architect, 18, Luggar-road, Camberwell, S.E.—.....

H. uses. Retaining. Drainage.  
Wal. Ld. mdy.

M. E. Chandler, Belvedere..... £55  
H. Green & Son, Camberwell..... £15  
L. L. Leader & Co., Chiswick..... 15  
\* Accepted.

ROSTON SPA.—For the execution of drainage and outfall  
works for the Wetherby Rural District Council. Mr. T. J. Town-  
dale, surveyor, 10, Central Office, Annfield Plain.—.....

Contract No. 1.  
H. Wilson..... £5,132 8 0  
W. Briggs..... 5,035 8 0  
M. Ansell..... 5,132 8 0  
Graham & Sons..... 5,700 0 0  
\* Accepted.

CHIGWELL.—For the erection of ophthalmic buildings at  
Chigwell, Essex. Mr. A. P. Porter, architect.—.....

F. V. Carter..... £5,004  
K. Keen..... 5,004  
George & Hosking..... 5,004  
H. Reed..... 5,004  
W. M. Norton..... 5,004  
\* Accepted.

CHINGFORD.—For the erection of factory at Hale End, Ching-  
ford. Mr. J. Rookwood, architect.—.....

W. Shumart..... £3,528  
Harts & Wardrop..... 3,528  
\* Accepted.

DEVONPORT.—For the construction of a public conveni-  
ence, Northcote Quay, for the Town Council. Mr. J. F. Burns,  
Borough Surveyor, Municipal Offices, Ker-street, Devonport.—.....

I. Healy..... £244  
T. Jenkins & Son..... 244  
\* Accepted.

FWELL (Sussex).—Accepted for the erection of villa at Fwell,  
for Mrs. Omar. Messrs. C. Richards & Co., surveyors, 15, Wal-  
brook, E.C.—.....

L. L. Leader & Co., Chiswick..... £557  
Four tenders sent in.

GLEN PARVA.—Accepted for the erection of six small villa  
residences, for Mr. W. H. St. Simpson. Messrs. Simpson & Harvey,  
architects, Leicester.—.....

D. Halford & Sons, Blaby..... £1,830

KILKENNY.—For additions to workshop, for the Union Guar-  
anties. Mr. J. F. Reid, c/o J. J. Street, Kilkenny.—.....

W. K. Cleere, Kilkenny..... £250  
John Dowling, Freshford..... £243  
\* Accepted.

LEICESTER.—Accepted for the re-building of shop premises in  
High-street, Leicester, for Mr. William Hill. Messrs. Stimpson &  
Harvey, architects and surveyors, Leicester.—.....

Charles Wright, Leicester..... £550

LEICESTER.—For the construction of new roads and sewers on  
the Grange and Dolly Estates, for Mr. William Elliot. Messrs.  
Stimpson & Harwood, architects and surveyors, Leicester.—.....

T. Philbrick, Leicester..... £801  
Stimpson & Harwood..... £801  
Bentley & Loch..... 801  
\* Accepted.

LONDON.—For rebuilding the "Alexandra Hotel," Wood-  
Green. Mr. A. E. Fridmore, architect.—.....

Heer & Gash..... £2,507  
Knight & Son..... 2,507  
J. Tennant..... 2,507  
F. Walker..... 2,507  
Kilby & Gayford..... 2,507

LONDON.—For erecting two blocks of artisans' dwellings at  
Hill-street, Shadwell. Mr. G. Drew, architect.—.....

Hooley Bros..... £8,743  
H. L. Holloway..... 8,743  
B. E. Nightingale..... 8,743  
Calman & Sons..... 8,743

LONDON.—For erecting a Mission Church, Chatsworth-road,  
Clapton. Mr. B. Crew, architect.—.....

L. & H. R. Roberts..... £7,399  
Godfrey & Son..... 7,399  
Lancelotti..... 6,895  
Reine..... 6,895

LONDON.—Accepted for erecting two houses (arranged as self-  
contained flats), Fulham, for Mr. Erzbach. Mr. Hall, surveyor,  
Fulham-road.—.....

L. L. Leader & Co., Chiswick..... £6,700

LONDON.—For alterations and repairs to the "Bel" public  
house, Belton-street, Hoxton, N. for Messrs. Chander, & Co.  
Mr. J. G. Needham, architect, 18, Lower Clapton-road, N.E.—.....

K. Ridgeway & Sons..... £207 0 0  
\* Accepted.

Griffithing.  
J. Steelman..... £85 1

LONDON.—For the erection of two blocks of Bt. Trouville  
road, S.W., for Messrs. Joyce & Hall. Messrs. Bichard & Con-  
struction, 11, Spring-garden, S.W.—.....

Turtle & Appleton..... £3,391  
Whitehead & Co., Ltd. (accepted)..... £9,391

LONDON.—Accepted for the erection of engine and boiler  
houses, for the City and South London Railway.—.....

L. Whitehead & Co., Ltd..... £17,742

LONDON.—For the erection of two shops at Royley Hill  
Hamstead, for Dr. T. G. Munyard. Mr. E. H. Sim, architect, 8,  
Craig-croft, Charing Cross. Quantities by Mr. J. G. W. Buss.—.....

Bywaters & Sons..... £5,976  
Holloway Bros..... 5,976  
L. L. Whitehead & Co., Ltd. (accepted)..... 5,976

LONDON.—For renovations, &c., at No. 3, Ashing-  
ton-street.—.....

W. Holt & Sons, Croydon..... £1,637

LONDON.—For the erection of a factory at 17, Albion-street  
King's Cross, N., for Messrs. Stephenson, Mager & Co. Mr.  
E. A. Emmett, architect, Monney-road, Tufnell-park, N.—.....

Extra for lead roof..... £1,218  
Pattam & Fotheringham..... £3,791  
Extra for lead roof..... 37  
Scrivener & Co..... £1,199  
Extra for lead roof..... 17  
Food & Sons (of Beaufort) (accepted)..... £1,226  
Extra for lead roof..... 66  
..... £3,861

LONDON.—For erecting a wash-house at Bayer-street, G. Kent  
lane, E.C. Mr. J. Greene, architect.—.....

H. Irving..... £5,344  
Woodward & Co..... 4,608  
Kilby & Gayford..... 4,608  
H. L. Holloway..... 4,608

LONDON.—For rebuilding Nos. 70 and 71, Shoe-lane, E.C. Mr.  
H. K. Knight, architect.—.....

Nightingale & Co..... £4,403  
Turtle & Appleton..... £4,403  
W. Shumart..... 4,370  
Chase & Son..... 4,370

LONDON.—For erecting new premises at Hackney for the  
Hackney Furnishing Company. Mr. J. Hamilton, architect.—.....

Marten & Sons..... £3,900  
Green & Son..... 3,550  
B. E. Nightingale..... 3,585  
W. Smith..... 3,559  
G. W. Beale..... 3,477

LONDON.—Accepted for the re-erection of houses and shop pre-  
mises at Nos. 32 and 34, Leaman-street, Whitechapel, for Mr. Louis  
Samson. Mr. W. A. Longmore, architect, 7, Great Alie-street,  
E.—.....

A. Brown, Commercial-road, E..... £915

LONDON.—For the erection of a warehouse at Great Arthur-  
street, Golden-lane, E.C. Mr. J. Greene, architect.—.....

Woodward & Co..... £2,464  
Kilby & Gayford..... 2,435  
H. L. Holloway..... 2,390  
W. Shumart..... 2,366

LONDON.—For wiring for electrical installation, together with  
electric bells, at Abbey Court Mansions, N.W. Messrs. Metcalf  
& Greig, architects.—.....

Sharp, O'Brien & Co., Minorities..... £44

LONDON.—For heating on the Low Pressure System a house,  
containing 12, in Carlton-road, N.W., for Mr. C. Chaworth.—.....

Sharp, O'Brien & Co., Minorities..... £44

LONDON.—For the enlargement of the Post Law Office, Isle-  
worth, for the Guardians of the Poor of the Brentford Union. Mr.  
W. H. Ward, architect, Paradise-street, Birmingham. Quantities  
by Mr. F. W. T. Miller, surveyor, 19, Delahay-street, West-  
minster, S.W.—.....

T. Hiscock..... £1,055  
W. Wisdom..... 1,057  
T. Nye..... 1,701  
\* Accepted.

MARSTOWN.—Accepted for the erection of four small villa  
residences, for Mr. W. H. St. Simpson. Messrs. Simpson & Harvey,  
architects, Leicester.—.....

D. Halford & Sons, Blaby..... £1,830





\* "Windows ; a book on the Art of Stained and Painted Glass." By Lewis F. Day. London : B. T. Batsford. 1897.





Fig. 1.—Plain Glazing: Early French.

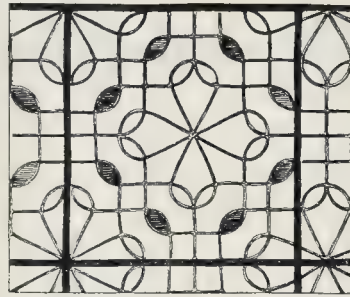


Fig. 2.—Plain Glazing: Lisieux.



Fig. 4.—Poitiers.

one in which to execute figures; they must at all events be very stiff figures with very imperfect expression; indeed the countenance cannot be got at all without some kind of surface painting on that portion at least of the glass. So that the author is quite justified in the remark which he makes on a later page, that "it is not quite certain but that glass really lends itself only to a rather barbaric kind of design, or what we are barbarous enough to call barbaric. This is certain, the interest of figure work has put an end to ornamental glass." And even in the earlier windows the difficulty of shaping the hands and feet of figures led to a good deal of the surface of the glass being obscured by painting out the portions of the field between the limb and the surrounding leading.

The first idea of stained glass is ingeniously illustrated and explained, for the general reader, by Mr. Day's diagram of a part of the map of Europe, supposed to be represented by variously coloured pieces of glass put together. The means of support of the glass have then to be considered, in relation to effect. The leading may be regarded either as itself a part of the design, or the spaces between it may be considered as constituting the design. In white or light-coloured glass the leading makes the design. In strongly-coloured glass the leading practically disappears, the strong light of the glass overpowering it; we only see it as a boundary of demarcation between two colours; not as a positive line. The problem is something like that of the bars and the spaces in a traceried window. Only it may be observed that whereas in the early geometrical windows the spaces form the design, while in the late decorated windows the bars form the design, in glass the order is reversed; in the more geometric forms of leading the leads seem to be the design, in the later and highly elaborated figure windows the leads are ignored as far as may be; worked in so as to be as little noticeable as possible. Fig. 1 is a good example of early glazing (French) in which the leads form the design, carrying with them the strip of glass between them, the whole forming a kind of interlacing band. In this class of glass the leading plays so important a part that sham leads or surface leads were sometimes introduced, to define small details of pattern into which the glass itself could not easily be cut in the ante-diamond days; an example is given on page 24 of Mr. Day's book. In the example from Lisieux (fig. 2) there is a kind of mingling



Fig. 3.—Grisaille Glass. St. Jean-aux-Bois.

of the two effects, for the small coloured compartments direct the eye to the glass and form a simple design in themselves; still the leads are the main design. When we come to grisaille glass, where there is much surface design but little colour, it is difficult to make any rule as to the leads. Mr. Day gives two examples, from Salisbury and from Chartres (pp. 148 and 150), in which the main features of the glass pattern are followed by lead lines, but in which various compartments are also crossed irregularly, and to all appearance needlessly, by stray lead lines, looking as if they were put in for the purpose of using up small and irregularly-shaped bits of glass. This uncertainty as to the function of the leading in the design is unsatisfactory and puzzling to the eye; in the example of grisaille work from St. Jean-aux-Bois (fig. 3), which is a finer piece of decorative design than either of the other two, a great part of the satisfactory and monumental appearance of the design is due to the fact that the leads conscientiously follow the lines of the conventional foliage, and give it greater breadth and support.

Then there is the question of the placing of the iron bars for the ultimate support of the leads, which has a certain relation to the design of the window. The diagram of a window from Poitiers (fig. 4) is an interesting

example of the simple arrangement of early work, with parallel vertical bars having little or no relation to the window design, and Mr. Day draws attention also to the nonchalant manner in which the central circle is allowed to cut into the border and fill the whole width of the window. Concerning this the author notes that it is characteristic of the early date of the glass (either before or early in the thirteenth century) that the bars, in this and one or two other analogous examples that are given, do not go out of their way to follow the outline of the circles, vesicas, quatrefoils and more shapes, but often cut right across them. In the fully developed thirteenth-century medallion window, in which the regular spacing of medallions had become an accepted custom, the bars followed the regular grouping of the medallions; of this a good many examples are given in the illustrations.

The subject of leading and bars, and their relation to the design, leads one naturally to think of the larger and more modern question of the mullioned window and the stained glass design. Mr. Day goes a good deal into this subject, and so far as we can make out his conclusions (for he seems a little uncertain and contradictory in his expressions) we do not agree with him. He fully admits that the object of the designer should be to accept the window plane; "to let you





Fig. 5.—Scratched Diaper.

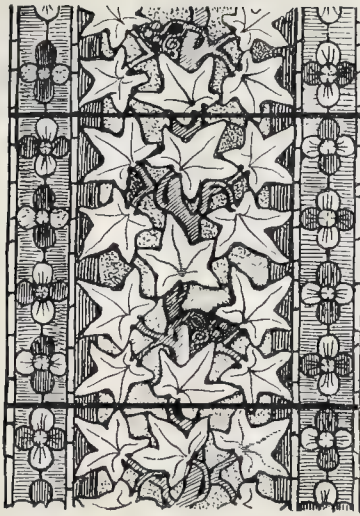


Fig. 6.—Munich Museum.

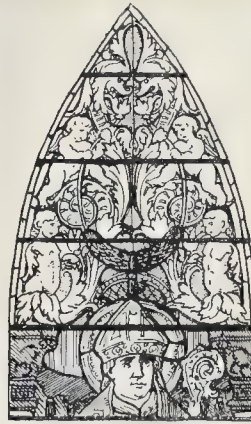


Fig. 7.—St. Peter, Cologne.

feel that it is a window you see, and not something through the window or standing in it." Then he says that "there is a great difference between designing a subject which extends through the whole width of the window, and designing it so that it appears to be seen through the window." That depends on how you understand the word "subject." The subject of a window may be, for instance, the *Te Deum*, and you may fill the separate lights with subjects all connected with that central idea, without carrying any group across the mullions. But Mr. Day seems to see no objection to the latter process. "If you were looking at a scene through a window, of course the mullions would interfere. Why, therefore, consider them if you wish to produce the effect of something seen through? . . . If the design is so planned that the important figures are grouped in separate lights, the landscape or other continuous background helps to hold the picture together, and is not hurt by the mullions." We differ from this *in toto*. Passing over for the present the question whether there ought in any case to be a landscape or other continuous background, the mullions are a portion of the architecture, to which the glass ought to be subordinate; and the glass is fixed in the jambs of the mullions, and therefore has no business to seem to pass behind them. The example given with approval by the author, of a reclining figure from a window in St. Mary's, Shrewsbury, which passes through three lights and behind the mullions, is to our thinking utterly absurd and wrong, whether in an ancient or a modern window. It is a contradiction of the structural facts.

The reader will find the process of transition from stained glass to painted glass, or glass in which painting was largely employed, very clearly told in Mr. Day's pages. In regard to the late glass he notes how the method of workmanship, though the work itself became more and more pictorial in

effect, became less and less like painting; became in fact almost the reverse process—not putting on pigment but rubbing it off, the surface being covered first with a "matt" tint, and then lights taken out of it with a stiff brush, or even with a point, either for modelling a face, or for producing the "scratch diaper" such as is shown in fig. 5. This latter, although the process is commenced by covering the glass with an opaque tint, really produces an effect of brilliancy. Still, there can be little question that all the niceties of stippling on shadows and scraping out lights, which assisted the later glass artists in their elaborate figure subjects, were going further and further from the real original art of stained glass. The effort after naturalism in foliage ornament was not carried so far in any English work as in such a German example as is shown in fig. 6 from the Munich Museum. This is an extreme case, but taken in contrast with fig. 3 it serves to show very emphatically the weakness of naturalistic foliage as compared with such finely architecturalised design as that from St. Jean-aux-bois.

One of the legacies to us of the Mediæval artist is the architectural canopy, which formed in late work the means of filling up the spaces round and above the figures, and which seems at this present moment to be more in favour than ever; we rarely see a window without it. Mr. Day has been original enough to question the reasonableness of the canopy, and here we are entirely with him. It is, he observes in one place, "a making shift with sham architecture for the ornamental setting necessary to bring the figure into relation and into proportion with the window it is to occupy;" but this apparently solid structure, or attempted imitation of a solid structure, is quite out of place in glass design, and "it would have been easy," to quote Mr. Day again, "to have devised decorative forms at once more frankly orna-

mental, more interesting in themselves, and more beautiful, not to say less suggestive of a child's box of bricks"; and, as he says further on, "if anything in the nature of a canopy be desirable, clearly it should be constructed on the lines, not of masonry, but of glazing." The present admiration for the canopy is purely a piece of association; it is a precedent of what is supposed to be proper to stained glass (especially in a church). Mr. Day gives among his illustrations a German version of the canopy (fig. 7) which almost ceases to be a canopy and becomes arabesque, though, oddly enough, accompanied by the traditional capitals from which the canopy formerly sprang. This is not a very powerful piece of design, but at least it indicates more the right kind of thing for filling the head of a window, instead of a quasi-solid imitation of architecture. With the ordinary Renaissance canopy "it formed part of the canopy scheme that the structure should end before it reached the top of the window, so that you could see beyond it into space. The designers would have been only too happy if they could have done away with the glass above that." This of course, from our point of view, was only making bad worse, endeavouring to give a still more real and solid effect to a feature that had no business in glass at all.

There is a chapter on landscape in glass, concerning which we should say that there ought to be no such thing, unless in a highly conventionalised or symbolical treatment. Mr. Day speaks, apparently with sympathy, of "delightful peeps of landscape sometimes seen through the columns and arches of an architectural background." From the way in which the sentence is introduced we do not quite gather whether he is speaking generally, or referring to a special school of windows. We can only say that the landscape seen through an architectural background is a double crime; two backgrounds instead of one. Stained-glass has no business with "backgrounds."

It seems to us that while Mr. Day has written in this book more sound criticism on stained-glass art than we have seen for many a day, he has just not gone quite far enough. He seems to have been unwilling to shake off all the traditional mistakes in stained-glass design, although he has ventured to question them all. In regard to the question



of perspective, for instance, he only takes a half-and-half position. To contend that all lines in perspective are amiss in glass is, he says, to go too far. "As long as no effect of relief is sought, no effect of distance attempted" (then what becomes of the "peeps of landscape through an architectural background") "one can hardly find fault with lines indicating the perspective necessary perhaps to the expression of the design." If such lines are "necessary to the expression of the design," the design must be wrong. If we take such an example as the window from Gouda shown in fig. 8, a long gallery stretching



Fig. 8.—A Picture Window: Gouda.

away behind the mullions of the window, we can all see that such a treatment is absurd. But if so, the treatment of a niche in perspective is also absurd; it is only a question of degree, not of principle.

To sum up: The modern stained glass is, as we have already said, almost all wrong. Whether white glass with a design made in the leading, or grisaille glass with patches of colour, or a complete scheme of strong coloured glass leaded up, the window design ought to be a flat plane. The main object should be decorative; and if we have figures they must be treated as a flat design; and if we want a definite subject expressing an idea, it must be expressed not with any approach to realism, but in the way of symbolism. That this can be done has fortunately been shown in a few—a very few—modern stained-glass designs; some of those by Mr. Holiday and Mr. Whall, for instance, and that is what should be aimed at. Discard figure subjects arranged in a pictorial fashion; discard sham architecture; discard landscape and backgrounds; aim at decorative effect, combined (if something more than decoration is desired) with symbolical meaning. From this point of view some of the Renaissance glass, though painted and not really stained glass, is much more in the right direction than the late Medieval glass, with its canopies and groups of figures and backgrounds. The Italian grisaille window shown in Mr. Day's illustration on page 298 of his book, for instance, though no doubt weak in style, is a real window design—

perfectly flat and with no pretence to being anything but a flat plane with decorative design painted on it. With a pure pot metal window leaded up, something much finer in colour and much more architectural in style could be produced, no doubt; but that is the direction in which to work. Give up imitating the mediaeval types, and study decorative and symbolic design in flat form; and then we may hope that, in Mr. Day's own words (p. 321) "there may still be a future for windows merely ornamental, which shall yet satisfy the sense of beauty."

Before quitting what in the main we regard as an admirable book, we may call attention to a printing mistake on page 85, where what is now line 11 has got into its wrong place. This should be corrected in a second edition.

#### NOTES.

The Duties of County Councils.

THE Report just published in a Blue Book on the organisation of the Local Government Board

contains some interesting suggestions in regard to the functions of County Councils. The County Councils' Association has suggested—as one way of lessening the pressure of work at the Local Government Board—that some of the functions exercised by the central body should be undertaken by County Councils. It appears, however, that there is so much hostility among Urban Councils and other bodies to an increase of the jurisdiction of the County Councils, that the Committee are unable to do more than recommend that some duties of which the Local Government Board can divest themselves without legislation should be handed over to County Councils. These are, we take it, more or less nominal. The interest, however, of the Report lies in this, that it emphasises the fact that County Councils are not only taking over all the work that they can do, but that they are willing to take over more. They have already become the most important of local bodies; their work attracts able and capable men, and there can be no doubt that their importance will go on increasing. Sooner or later they will become, in some form or other, the educational governing body of the county. The county, in fact, is attaining a position of great modern constitutional importance, and the more efficient its Council becomes, the easier it will be to transfer to it fresh functions, which will relieve not only the central departments in London but Parliament itself. Almost without our being aware of it, a great constitutional change is in progress.

Replenishment of London's Under-ground Water.

A SUGGESTION has been made by Mr. E. Bailey-Denton with reference to the London water-supply question, which, if not altogether feasible, at least merits consideration. After calling attention to the circumstance that the decline of the water level in the chalk and other formations has during the last twenty years, though gradual only, has been considerable, he describes a method by which the quantity of water abstracted could in some measure be replenished by introducing flood water into the pervious formations. The rainfall of the Thames Valley is about 27 in. per annum; he observes that of this, 18 in. disappear by evaporation, 4 in. serve to maintain the flow of the river, whilst 5 in. pass away as floods. It is this last with which he proposes to replenish

the water-bearing strata. Without in any way accepting these figures, except in regard to the actual rainfall, we may pass on to consider the method suggested. The flood water is not to be stored by means of reservoirs or lakes, but the replenishment is to be effected whenever in rainy seasons the water in the main river or any of its branches rises to above a certain height (not specified) by the excess being diverted out of the river channel on to filter beds. The descent of the water from these filter beds to the desired stratum is to be effected by sinking shafts, into which the water is to pass after being freed from flocculent matters. Now, this little scheme might do very well if the chalk could be relied upon to take the water fast enough, and to distribute it over a great part of the lower Thames basin in the course of a short time; though the chief gainers by the adoption of the method would be the owners of large private wells. The water companies would not benefit much by the sending away from the Thames that which they so urgently require; and even were they empowered to sink wells to capture the superfluous water elsewhere than in the neighbourhood of their present intakes, it is easy to imagine the effect of exhaustive pumping such as would be required. One of the objects of the scheme is to obviate the necessity for the construction of reservoirs and lakes for storage purposes, but the usual rate of percolation of water through chalk is so slow, and the volumes of water that would be delivered by the river in flood in a short period so large, that immense storage would still have to be provided to give the water time to escape underground; at least that is our view of the matter. One of the most difficult parts of the problem would be the selection of a suitable site for the proposed shafts.

Abbeys Mansions, Victoria-street.

APPARENTLY the coroner's inquest on the deaths of the men who were killed some months ago by the falling of a pier and part of the concrete roof has not ended the history of this disgracefully-erected building. The frontages to Victoria-street and Orchard-street have now been condemned as unsafe by the Surveyor of the London County Council, and the whole building is to be taken down; in the meantime it has been regarded as in so dangerous a state that the traffic past it has been diverted. It appears that workmen had been engaged in attempting to put on a new roof, and shoring up the walls, but it has now been found that the foundations were giving way. This fact forms a significant comment on the ruling of the Judge who persisted in believing, against the weight of the evidence, that the striking of the centres of the concrete was the sole cause of the disaster, and fully bears out the view which we took of the matter in our issue of May 28.

Close of the Acetylene Exhibition.

THE Acetylene Exhibition at the Imperial Institute was closed on the 15th inst. Throughout the period of three months during which the exhibition has been held, no mishap of any importance has occurred, and the authorities of the Imperial Institute and Society of Arts may be congratulated upon having thus demonstrated the fact that acetylene may with safety be employed for practical lighting



purposes. It is stated that the Committee's Report on the exhibition, including the results of lengthy tests made with each generator to ascertain the amount of acetylene yielded per pound of carbide consumed, is to be made public. Such a Report will be of great value, and will be eagerly perused by the generator makers; though it is likely to be the cause of much heart-burning and disappointment among many of the exhibitors, for when classification is attempted some must of necessity form the tail end of the list.

**THE remains of the Roman Fort at Saalburg on the Taunus range, near Homburg, are well**

known, not only to antiquarians, but to large numbers of visitors to Germany. They present a very perfect impression, or it might be more correct to say ground plan, since the remains are almost level with the ground, of a large Roman fortified stronghold. Some years ago\* an article and plan on the subject were published in this journal, and it was shown how much labour and care had been given to the work of clearing away the earth from these ruins, so that there was now no difficulty in clearly understanding every detail of the place. For though little more, as we have said, was left than the foundations, there were never at any time buildings so elaborate as to require great imagination to see them in the mind's eye as they at one time existed. It is, however, with great regret that we find that the authorities are not content with the admirable work of clearing the ruins; they have now taken the altogether false step of reconstructing the Porta Decumana, or principal gateway; this will probably be followed by similar work. It might be well enough to construct in some convenient place a life-size, or nearly life-size, model, of the encampment; but to add modern work to ancient remains takes away the character from the place. A ruin is not meant to be rebuilt. It has a distinct character of its own, whether it be a church, a castle, or a fort. It is not intended to be transformed into a model. The next thing will be, we suppose, to place wooden figures of Roman soldiers in the gallery above the gateway. We repeat that to mix up ancient and modern work in this manner is wholly indefensible, and it is very astonishing to find such an incongruity in Germany, and especially in connexion with work which has been so admirably superintended by the late Colonel Von Cohansen and Herr Jacobi.

**IN 1895 M. Moyaux, architect and Inspecteur-Général des Bâtiments Civils, obtained the first premium in the competition for the rebuilding of the Cour des Comptes on its old site on the Quai d'Orsay. As the new station of the Orléans railway has now obtained that site, the new Cour des Comptes will be built on a site at the angle of Rue Cambon and Rue Mont-Thabor, next to the Church of the Assumption. The principal façade will be towards Rue Cambon. The estimated cost is 4,500,000 francs.**

**WE have from time to time referred to the increase in the size and importance of the post-offices throughout Germany. Another instance of this building growth may now**

be seen in the offices at Strasburg, which will be completed next year. They are in the new part of the town beyond the river Ill, and may be said to form a part of the group of public buildings which have grown up during the last few years—the Imperial Palace, the Hall of the Provincial Diet and the new University Library. The new Post Office can hardly be regarded as a success from an external point of view; there is a feeble attempt made to give a kind of Gothic characterisation to the windows, doorways, and other details of the building, which is not in harmony with the classical character of the other buildings which we have spoken of. Still, as we have often had occasion to say before, we wish that our own Government would follow, even if but distantly, in the steps of Germany in regard to the erection of post-offices.

**An order of the licensing Court in Edinburgh has recently been issued requiring that licence holders should furnish plans of their premises to the Court. This appears to have caused quite a sensation among architects of a certain stamp in Edinburgh, in illustration of which a copy of the following communication has been forwarded to us, a lithographed letter bearing the name and address of an Edinburgh architect of whom we never heard before:—**

“Edinburgh, September 5, 1898.  
DEAR SIR,—In reference to the order issued at the last licensing Court that the licence-holders must furnish plans to the Court of their premises, I beg to offer to undertake the preparation of such plans on very moderate terms.—I am Sir yours faithfully

Office hours: 10 a.m. to 5 p.m.”

This letter, we are informed, is being largely circulated in Edinburgh among the class of tradesmen who may be supposed to require the assistance offered. We decline to assist the author in his advertisement by giving his name and address, but we should advise those who receive such a communication to be cautious of employing any architect who takes this means of recommending himself.

**THE Forty-Second Annual Report of the Vestry of the Parish of Chelsea has been issued. Among the subjects reported on we find the trial by the Surveyor of some compressed asphalt paving blocks laid down in Kilburn-lane, which have been reported on favourably, and the paving is to be put to a more severe test by laying some of it along the south side of Sloane-square, where the traffic is very heavy. In November part of the river wall in Cheyne-walk was damaged by the unusually high tides, and the District Surveyor having reported that it must be rebuilt at this point (opposite Milman-street) an opportunity was afforded of widening the roadway by setting the wall further into the river, an alteration to which the sanction of the London County Council and the Thames Conservators was obtained. During the year the Chelsea Electricity Supply Company sought for powers to acquire compulsorily certain lands in the Parish of Chelsea (between Flood-street and Manor-street), including a depot of the Vestry, which they had repeatedly declined to sell to the company. A deputation, representing a number of owners and inha-**

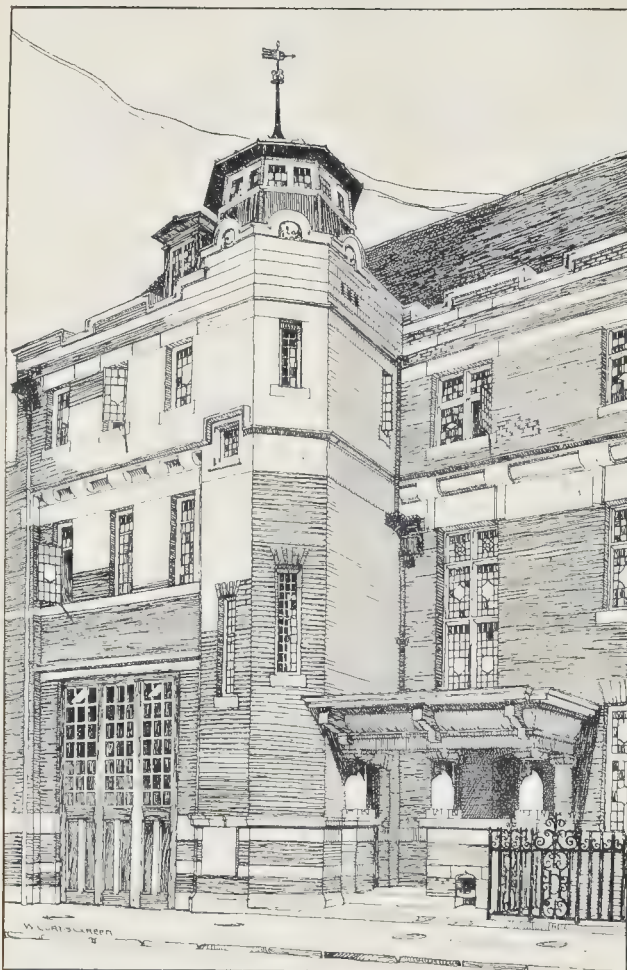
bitants of property in the locality, attended before the Vestry, and urged them to strenuously oppose the Bill, pointing out that the vibration and noise from the company's existing works, and the emanations from the chimney shaft, were an intolerable nuisance to the occupiers of adjacent property, and that a great hardship would be inflicted on a number of poor people if they were dispossessed of their homes. The Vestry deposited a petition praying to be heard against the Bill, mainly on the ground that their duties as Surveyors of Highways and as the Sanitary Authority would be seriously interfered with if they were deprived of the use of their central depot. It was, however, read a second time on March 22, but prior to this date a Joint Committee of both Houses of Parliament was appointed to consider the question of granting powers for compulsorily acquiring lands for generating stations; and probably their report, when issued, may alter the position of things.

**Glasgow Architectural Craftsmen's Society.**

**THE opening meeting of this Society was announced for Friday night, this week, when Professor MacLay was to read a paper on “Hamburg, Berlin, and Dresden.” We did not receive any notice of this from the Secretaries in time to announce it in our usual list last week. In the prospectus it is stated that “a patron of the Craftsmen's Society” has offered a prize for the best paper on “My Impressions of Glasgow Cathedral.” The donor will conduct the members through the Cathedral on October 15. This is a rather unusual prize, and as there has been a good deal of controversy about Glasgow Cathedral lately, the result may be of some interest, if the competitors keep themselves clear from the temptation to merely follow or adopt the donor's views.**

**A HANDBOOK to St. Saviour's Southwark, or Southwark Cathedral, which has been sent to us, compiled by the Rev. Canon Thompson, the Rector of the church, affords a charming example of that indifference to the claims of architects and artists which is so characteristic of the English mind, and is perhaps nowhere more notable than among clergymen. The book gives an illustration of the new nave, records how its foundation-stone was laid by the Prince of Wales, and how, after 50,000*l.* had been spent, it was opened, with the names of the royalties and principal ecclesiastical dignitaries who took part in the ceremony, but no mention whatever of the architect, whose name occurs nowhere in the book. Some new windows are acknowledged as the work of Mr. Kempe, and another one as the work of Mr. Holiday (whose name is mis-spelt “Holliday”); the name of the builder of the organ is also given; but the architect of the great new nave is not thought even worthy of mention. There is also a list of all the gifts which the church has received—nearly all of them works of art; but while the names of all the donors are given, those of the designers are ignored. The question with the average Englishman is not, who designed the thing? but—who paid the money? The list of donors is said to be given “pour encourager les autres.” We presume the omission of the architect's name, and of all recognition of him, is also “pour encourager les autres.”**





Sketches of London Street Architecture. No. XXIX. House in Avonmore-road.

#### SKETCHES OF LONDON STREET ARCHITECTURE.—XXIX.

THIS is a house in Avonmore-road, designed as an artist's house and studio, and carried out in red brick with stone dressings, red tiles, and a lead-covered lantern. The staircase, as will be seen, forms a feature in the design of the front, and is well introduced; and there is considerable originality in the details.

MICHELANGELO.\*

By C. J. TAIT.

IN 1513 Julius died and Leo succeeded to the Papal See. This proved a period of worry to the sculptor in reference to the eternal tomb, and much of his time was again spent amid the loneliness of the Carrara Mountains. Julius, despite his temper, had been an honest friend to Michelangelo. He was a pontiff of principle, if his principles were bad. They were so far bad to have earned him the reputation of being Italy's curse. It was he who, while a cardinal, got Charles VIII. to move from Lyons, and commence his destructive journey south. He brought dignity to the papal throne, but he bought it at the expense of his country. Machiavelli has been a much

\* The second of two lectures upon "Michelangelo and His Masters" given at the Exeter Technical and University Extension College, June, 1897.

bespattered person, yet his utterance shortly before his death was, "I love my country better than my soul." The truth is that Italy was no more to a pope than England, France, or Germany. Italy had to sacrifice herself for the political ideal of a universal church. Leo was one of the ordinary pleasure-loving Medici, whose estimate of his position was that it gave him increased facilities for masks and carnivals. "Let us enjoy the papacy," he said, "since God has given it to us." Cardinals in hunting costume were an everyday sight, while incompletely attired dancing girls moved the pilgrims to the Eternal City to wide-eyed astonishment. To serve such a master went much against the grain of Michelangelo, with his self-contained ascetic temperament, and he must have been relieved by his patron's sudden death. Adrian VI. succeeded Leo, a Fleming who spoke no Italian and was happily ignorant of the arts. Michelangelo might have enjoyed a prolonged holiday had it not been for the Cardinal Giulio de Medici, who afterwards became Clement VII. This prelate conceived the idea of erecting a mausoleum to the Medici family, in the shape of a new sacristy to the Church of San Lorenzo at Florence. San Lorenzo has ever been identified with the Medici. Both Cosimo and Lorenzo lie buried there. The façade had been left incomplete by Brunelleschi, and it had been a plan, though a half-hearted one, of Leo's to

get Michelangelo to complete this west front. The sculptor was bound under his contract for the Julius tomb to turn his hand to no other work until that was finished, an agreement moreover, to which Leo was a party. Nevertheless, plans were made for the new façade though they were never carried out. Indeed most of the seven years of Leo's reign were probably occupied by the sculptor over what his historian, Condivi, has described as a "tragedy of the Julius tomb." Road-making up in the mountains, the construction of engines for handling and moving the marble blocks, and the shaping of them in the quarry negotiations and contracts with hawlers and boatmen for their conveyance, the arrangement of strikes on the part of the men—those and many more matters squandered his time.

In 1520, however, he had delivered plans for the new sacristy. It was in the old sacristy, may remind you, where Donatello's gates stood. The new sacristy as we now see it was never intended to be so left by the architect. It was to be filled with sculpture, while the architectural treatment was to be but a background. Had Michelangelo's architectural principles been a little more robust, his leading lines would have given the clue to his ultimate intentions. But his art is always a pot-pourri of this, that, and the other, and, though Classic in form, in sentiment it is absolutely the reverse.

Indeed, Charles Garnier, the French architect, considers that Michelangelo was not, properly speaking, an architect. "He made architecture which is a different thing. And most often it was the architecture of a painter and a sculptor which points to colour, breadth, imagination, but also to insufficient studies and incomplete education. He has not learned the language of the art. He has all the qualities of imagination, invention, will, which form the great composer; but he does not know the grammar and can hardly write. In seeking the great he has too often found the timid; seeking the original, he has fallen upon the strange, and also on bad taste." Though this is probably true enough, the bad taste referred to was the fault of the age, while too much education, as is the tendency of the French schools to-day, may become a fault rather than a virtue.

Michelangelo certainly made architecture more interesting, if less correct, than did his contemporaries, San Gallo and San Savino. Yet let me add that, in playing with accepted Classic detail, and seeking to be as original as you can, you are playing with edged tools. That he was less of an architect than a decorative artist is shown by his want of organic constructive lines. His walls are thick enough, and then he has done with architecture, and the rest is but detail and linings of marble glued to the work.

But the result is interesting, made so by the strange individuality of the man. There is about the spacious circular building a grave air of refinement that harmonises with its purpose. If some of the features are a little dull and apparently meaningless, we must remember that they are unfinished. The principal sculptures approaching completion are the two tombs of Lorenzo and Giuliano de Medici. These, as you know, do not represent the two great men of those names, but son and grandson. What was still lacking to the chapel may be gathered from a letter written to Michelangelo as late as 1502, wherein he is asked what designs he made for the four tabernacles on each side of the tombs; also what he projected for the eight statues above the doors and in the tabernacles of the corners; and, finally, what were his ideas for the paintings that were to adorn the flat walls and semi-circular spaces of the chapel. But nothing came of this attempted revival, and the whole remains as it was left. In these two monuments we feel that the sculptor has put much of the pent-up feeling of his inscrutable nature was wont to harbour.

He was sincerely attached to the Medici. They were not, like Julius, patrons; they were friends. In their death he beheld the tragedy of Italy. It is somewhat of this feeling that we see shadowed forth in these remarkable groups. In the one, Lorenzo "brooding, injured and indignant, over his own doom and the extinction of the race." Figures that we are wont to call "Dawn" and "Twilight" are stretched recumbent beneath him. The one starting from unresistful slumber—or does she but rouse herself from lethargy, to make a final effort to free herself, like the slaves



upon the Julian tomb, from bonds not less clinging if invisible? "Twilight" lies, a herculean figure, like the Dionysos of Phidias, but sickled over with the pale cast of thought.

In the other tomb Giuliano is not so much at one with his accessories as in the Lorenzo. He is more a citizen of this world, and unaffected by the mystery embodied in the fateful figures beneath him. It is as "Night" and "Morning" that these are known to us. "Night" is finished, even to its polished surface, as though in portraying the dark watches experience had lent its aid to the sculptor; while the other is incomplete, fraught as it might be with the suggestion that none could say what the day might bring forth. The mystery embodied by these figures is touched on by some lines written by an unknown hand, and supposed to be answered by the statue:—

"The Night thou seest here, posed gracefully  
In act of slumber, was by an angel wrought  
Out of this stone; sleeping, with life she's fraught:  
Wake her, incredulous wight—she'll speak to thee."

"Dear is my sleep," so runs the statue's reply:—

"Dear is my sleep, but more to be mere stone  
So long as ruin and dishonour reign:  
To hear nought, to feel nought, is my great gain;  
Then wake me not, speak in an undertone."

A group of the Madonna and Child stands in the sacristy, with also figures of two saints; an intended ensemble, perhaps, with a fresco background. What the general scheme was, we do not know; and the architecture suggests no place for them. The Madonna is, I think, most charming and successful—so very essentially his—showing that inconsequent mingling of the painter and the sculptor that is characteristic of him. In this way it resembles the Lorenzo. The effect depends more upon masses and light and shade than upon gradations of form. In the softer outlines of the Mother and bambino, he is always happy, and devoid of those tendencies to realistic effect displayed in his Pietàs, where the emaciated limbs of the dead Christ offered him opportunities of anatomical minutiae that are at once painful and unsuited to sculpture. Indeed, Michelangelo is constantly offending by his inartistic display of anatomical knowledge. Greek sensibility towards the human form, its recognition of a mobile muscular formation lying beneath the surface, over which the nervous surface again moves, yet the whole is supported upon a powerful yet articulated framework of bone, is a revelation that Italian art but little grasped. It is rather an endeavour, by means of anatomical knowledge gained by dissection, to thrust everything to the surface—bone, muscle, and tissue—and by doing so strengthen, as it thinks, the resemblance sought for. But it is the emphasis only of exaggeration. The Italians did not know perhaps the Greek adage that the "half is greater than the whole"—a suggestion, that is, may convey more to your mind than a laboured minuteness of description.

The work at San Lorenzo was interrupted by an uprising in Florence and the expulsion of the very mean and inferior Medici Prince Alessandro. Alessandro appealed to Rome. Michelangelo meanwhile was appointed chief engineer of the military works at Florence in view of possible eventualities. He had reason to suspect the honesty of the Florentine General, and expressed his suspicions to the Signori. His complaints, however, not being well received, he betook himself to Venice, where he met with a public welcome that was gratifying to his wounded pride. But delegates followed him from Florence, and he was induced to return to his post. He felt at heart that the fate of his beloved city was worth more to him than personal considerations. On his return he set to work to raise a chain of fortifications around S. Miniato, a vulnerable spot from which the enemy's guns could command the city. He ingeniously protected the old church with mattresses against the enemy's fire, and all might have gone well had not his suspicions been fulfilled, and Malatesta, the General, turned his guns upon his own garrison, thus making an opening for the opposing force.

Michelangelo, fearful of his reception by the Pope after the part he had played, lay hid a long while in the campanile of San Nicolo, till spare his services, and a pardon was promised should he care to disclose himself. So he returned to his work at the sacristy. The

sculptor remained in Florence engaged on this work until 1534, when Clement died, and the new Pope Paul summoned him to Rome to continue his labours in the Sistine Chapel, and for the next seven years this chiefly occupied him. It was about this time that he made the Pietà, now in the Duomo at Florence. I think there is a greater simplicity of feeling, though not of execution, about this group than perhaps in any other of his works. Condivi, his historian, considers it his rarest and most difficult of masterpieces, particularly because the figures are kept apart distinctly, nor does the drapery of the one intermingle with the other. Nicodemus, who stands behind, has been said to represent the sculptor himself. His mind, we know, was much turned towards religious sentiment at this time. It was now that he was writing the most finished of his sonnets, and when, too, his friendship with Vittoria Colonna made so deep an impress upon his life. Michelangelo's nature was never otherwise than responsive to those obstinate questionings that beset human life, but about Colonna's personality there hung much of the cloister, an influence which brought a more intense illumination with it. But an influence not less strong must have been the tender thoughtfulness of womankind that broke down that wilful solitariness of his disposition that had made him a stranger to the green pastures of life. Of old age brought with it a sense of more willing dependence, he was nevertheless as vehement as ever. This Pietà is unfinished. Attacked with his customary fury of mallet and chisel, he went too deep into one of the Madonna's elbows, and he did not care to go on with it. He had to work at it early in the morning, with a candle stuck into his cap, that he might keep himself in health, as he said.

Michelangelo's career as servant to the Papal See began with the design for the unfortunate tomb which led Julius II. to commence the destruction of old St. Peter's. The tomb he never built, but he was destined to preside over the fortunes of the new Basilica, "raising the dome which dominates the Roman landscape like a stationary cloud upon the sky-line."

The old Basilica, as Constantine had left it a thousand years before, formed, with its surrounding courts and buildings, so picturesque a group that one doubts if anything has been gained by its removal. The great nave and aisles, the quadri-porticus or courtyards in front, and the fine Lombard campanile, were in fact left undisturbed until 1605, when, under Paul V. Michelangelo's design was added to, the plan being altered from a Greek to a Latin cross, and the existing nave and unsightly screen placed in front of it, which succeeds in entirely cutting off any view of the great church lying behind it.

The old buildings of the Vatican stand to the south, and the sacristy and Campo Santo to the north. A more various and interesting block can scarcely be imagined, forming, with its alterations and additions of centuries, a history of itself.

Bramante, the architect whom Michelangelo has referred to as plotting along with Raphael against his favour with Julius, commenced the present gigantic block in 1506 upon the plan of a Greek cross. He died in 1514, and Raphael was appointed to succeed him, with San Gallo, a practical architect, to assist him. Bramante was a good artist, and his design was bold and simple. His successors flattered it up, and converted the plan into a Latin cross. Raphael died in 1520, and Peruzzi took his place, reverting to Bramante's plan. Then Peruzzi died, and San Gallo, having a free hand, went on with his long nave and insignificant detail. The church, Michelangelo declared, would have been dark, inconvenient, and dangerous to public morals.

At last, in 1547, came Michelangelo's turn, and he again adopted the Greek cross. I think there is no shadow of doubt as to which is the more effective plan, when covered by a dome, to which the shorter arms of the Greek cross form a base, and draw the whole design together. The only position from which any idea can now be gained of the architect's intention, since Maderno's work has ruined the front, is from the east.

With this new office Michelangelo's troubles broke out afresh. He was growing old, and would gladly have avoided the tumults that always forced themselves into Papal enterprise. He would gladly have retired to Florence, where the Duke of Tuscany had invited him; but his holy master prayed him to remain for

the sake of the building. But he was set to work upon St. Peter's against his will, he declares, and has served eight years gratis, and with the utmost injury and discomfort to himself. Nevertheless, since, as he admits, it would be the cause of a great ruin, and also a great sin did he leave just when he was on the point of vaulting his cupola, he would remain. So he sticks to his post, despite the backbitings of his enemies, who declared that he was in his dotage, and that the church had never fared so ill as under his direction. In his dotage he was not, and though he lived to an unusually great age, this affliction never overwhelmed him. But the old man suffered from many of the physical ailments that come with age—pains in the back that made it very difficult for him to go upstairs, and he was obliged to leave the personal superintendence to a clerk of the works.

Bramante's dome was to have been a half-sphere; Michelangelo's was elliptical, constructed like Brunelleschi's at Florence—that is, two shells, an inner and an outer, joined at their apex by the lantern, and meeting each other about a third of their height from the base. The internal effect of St. Peter's, with a soaring cupola, is too well known to you probably to need description. The impression of its vastness seizes upon you as something weird. You overlook the vulgarities of detail for which Bernini is largely responsible. They are but passing and temporal in distinction to that element of the eternal in which a great thought reposes.

In St. Peter's Michelangelo strove to render the infinite finite, to resolve the absolute of that philosophy upon which he was reared into the concrete. In architecture he had no model to lead him astray as he had in sculpture, and I am inclined to believe that it is while standing beneath this dome that you behold the man as you find him nowhere else. He did not see the work finished, but he left sufficient details to enable it to be completed according to his intention. He was hard upon eighty-nine years of age; by the coming March he would have been so. But on February 15 a friend writes to his nephew Lionardo, "I advise you to come as soon as possible from Florence, starting immediately, but not hurrying overmuch, because if, as God forbid, the master's life is in danger, you cannot get here with the utmost haste to find him still alive, for, owing to his great age and his disease, he cannot live a great while." Michelangelo died upon the eighteenth of the month, and was carried to his dear Florence, where he was buried in his parish church of Santa Croce.

"Now hath my life across a stormy sea,  
Like a frail bark, reached that wide port where all  
Are bidden, ere the final reckoning fall."

So opens one of his later sonnets.

Such were the outlines of this great man's life—great in spite of his many failures, in spite of his divided aims. Much of his life must remain a blank page, for he was not one to mix freely with others. But he was capable of great attachments. One of these was for his servant and assistant, Urbino, who died some ten years before his master. How greatly Michelangelo felt his loss you may gather from the following letter:—"I inform you that yesterday, the 3rd of December, at four o'clock, Francesco called Urbino passed from this life to my very great sorrow. He has left me sorely stricken and afflicted; nay, it would have been sweeter to have died with him, such is the love I bore him. Less than this love he did not deserve; for he had grown to be a worthy man, full of love and loyalty. So, then, I feel his death has left me without life, and I cannot find heart's ease." This letter surely could not have been written by a man such as his enemies loved to paint, full of envy, hatred, and malice. His nephew Lionardo, to whom he was devoted, and who became his inheritor, I have alluded to. To this youngster the sculptor pens a letter that is very characteristic of him also:—"Do not write to me again. Each time I get one of your letters a fever takes me with the trouble I have in reading it. I do not know where you learned to write. I think if you were writing to the greatest donkey in the world you would do it with more care. Therefore do not add to the annoyances I have, for I have already quite enough of them." A certain Tommaso Cavaliere was a staunch friend to him, and of the mutual affection between the sculptor and Vittoria I have already spoken.

Then he had several protégés in the shape of



buffoon artists, who if poor painters were excellent wits who made him nearly to burst himself with laughing. This, with Michelangelo's saturnine humour, was a curious hobby, yet it adds a human touch to our knowledge of him.

What may we add to these personal traits in order to explain the position that he held when alive, and which he still holds now that he is dead? His life must speak for itself. I will only add, in the first place, his abilities were quite exceptional. He has been placed with Dante and Machiavelli as exhibiting with them the three greatest intellects that Italy has produced. He was also scrupulously upright, in a very corrupt, and indeed petty, age.

And what place can we assign him in the world of art? I would answer—one that he occupies alone. As M. Garnier says, "he made his own art." Never was man more self dependent. He was an era in himself, an interpolation in the history of Italian art. Not that he was free from the influences which had steadily grown, and were settling down upon art, but the turn he gave to them was a wholly individual one.

A fatality hung over Italian sculpture. Ever anxious to be free, to develop along progressive lines of its own, the ghost of the old Roman world was never entirely laid, and, like the Siren, she drew towards her all who lived within reach of her voice. With England, with France, this revival of classicism was to a certain extent an affectation, a cult. But in Italy it was part and parcel of the soil, and dyed with a purple hue its Mediæval sentiment. Upon Michelangelo this Nemesis descended in its full force. He wrestled with the inevitable. He sought by his Titanic power to tear from the dead age its secret, when it had none to tell. How many a time he was met with this silence we see by his unfinished works.

It is as idle to compare him to the Greeks as it is to compare him with the Tuscans. He is on the side of the Greeks, inasmuch as he took an idea for his theme. But he differs from them inasmuch as wherein the Greek ideas were always eminently simple, those of the Renaissance, influenced as they were by the school of Alexandrian sophistries, are as eminently involved. Consequently, much that the sculptor desired to convey to us is entirely lost upon us. The slaves of the Julian tomb, those upon the Medici tomb, must remain riddles.

He is on the side of the Tuscans, since he embodied his ideas with realistic effects rather than express an idea by an idea, that is by a generalised, idealised impersonation, which method we are accustomed to look for in sculpture. But he differs from the Tuscans, since he disregards those little details and niceties that they delighted in as masters in their crafts, and which give to their work such a lightness of conception and playfulness of touch. He cannot approach these in technical feeling.

Thus Michelangelo may hold an independent position, free from the jealousies of rival claims. His work is not better nor worse than anybody else's. It is just his own. Grecian or Mediævalist, you may admire it and suffer no condemnation.

#### WOLVESEY PALACE, WINCHESTER.

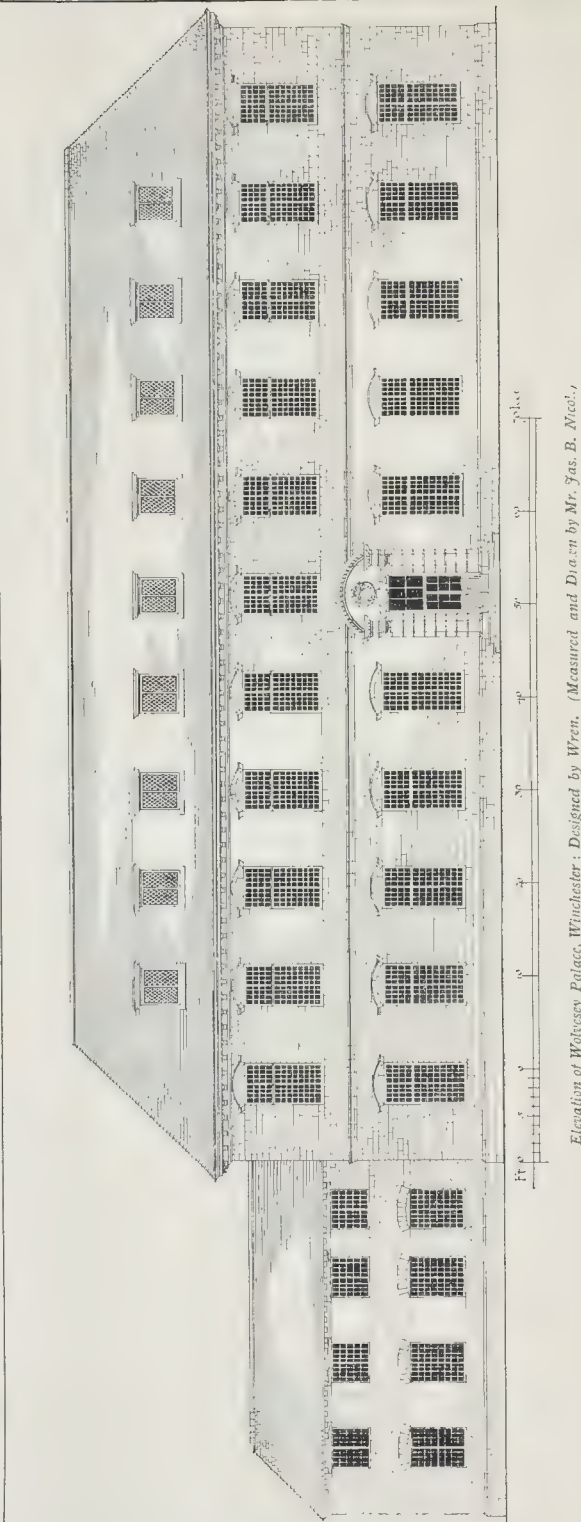
THE drawing shows the west elevation or garden front of the building, which was designed by Wren and erected by Bishop Morley (died 1684) and Bishop Trelawny (died 1721). The present unsymmetrical appearance of the front is probably caused by the demolition, in the early years of this century, of the south wing, which corresponded with the present low wing on the north side.

A curious feature in the arrangement of the courses is their gradual decrease in height from the ground upwards.

The cornice and the doorway in the centre, which have a later appearance, are of wood.

The illustration is from a measured drawing by Mr. T. B. Nicol.

PUBLIC WORKS, BARNOLDSWICK.—A Local Government Board inquiry was held at Barnoldswick on the 16th inst., into an application by the Urban District Council to borrow 12,500*l.* for the following objects:—Gasworks purchase, 2,000*l.*; sewerage, 1,840*l.*; water supply, 1,000*l.*; road roller and waggon, 500*l.*; and 2,500*l.* for the erection of an infectious diseases hospital on a site at Banks Hall. There was no opposition to any of the schemes.



*Elevation of Wolvesey Palace, Winchester: Designed by Wren. (Measured and Drawn by Mr. Jas. B. Nicol.)*



## ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties District Meeting of the members of the Association of Municipal and County Engineers was held at Bilston, on Saturday, the 17th inst. The weather more nearly resembled midsummer than mid-September, and there was a fairly large attendance of members, mostly of the Midland Counties. Mr. J. T. Eayrs, of Birmingham, presided.

The members assembled at the Town Hall, where they were received by Mr. Councillor Harper, Chairman of the Urban District Council, Mr. Councillor Sankey, and other members.

The Chairman, in welcoming the members of the Association, said he hoped that their presence would not only enhance the estimation in which Bilston was held by the outside public, but would be a source of instruction to their visitors.

Councillor Sankey said that they had two things which would be of interest to the members of the Association—an abundant water supply, and a technical school, which, considering the population and rateable value, was superior to any town in the country.

Mr. Eayrs acknowledged the official reception given to the Association, and apologising for the absence of the President (Mr. Robson, of Willesden), said they knew that surveyors of large districts had many claims upon their time. Although situated in the black country there was a good deal of energy in the carrying out of sanitary works; though there was no doubt that the conditions under which the industrial classes lived entitled them to a good deal more consideration than health resorts like Leamington, Cheltenham, and Bath.

On the proposition of Mr. Creatorex (West Bromwich), seconded by Mr. Marston (Sutton Coldfield), Mr. J. S. Pickering (Nuneaton) was re-elected Hon. Secretary of the Midland Counties District.

Mr. C. L. N. Wilson (Bilston) then read a paper on "Seven Years in a Black Country Town." After a historical review of Bilston, the author proceeded to describe the various public works of a municipal and sanitary character. The baths and washhouses were originally a private speculation, but turned out a failure, and in 1870 were purchased by the Town Commissioners and put into order at a total cost of 1,100l. In 1895 the baths were altered and enlarged at a cost of 3,500l.; the alterations including the laying down of an electric plant for lighting the building. The cost per unit for this installation was 1½d., and there had not been the slightest trouble with it from the day it started. The Town Hall, a stone building in the Italian style, was erected in 1871 and enlarged in 1880; and, in addition to the usual municipal offices and large assembly room, provided accommodation for the free library. The technical school, which was built of red brick with Doulton's terra-cotta quoins, pilasters and jambs, was Italian in style. It contained an engineering and metal-working room, fitted with gas-engine, lathe, drilling machine, four smiths' hearths, &c., wood-working room, cooking room, modelling and casting room, drawing rooms, large examination hall, chemical laboratory, &c. A museum was also provided, and in the entrance and examination halls a number of valuable pictures, loaned or given by various gentlemen. The building was erected from his (Mr. Wilson's) design, the contract for the building being 5,087l., and the extras 10l. 8s. 8d. In this respect Bilston could show the country a noble example. The total cost of the building and fittings was equal to about one-seventh of the total rateable value of the township, and yet it was built by public subscriptions, and grants from the Staffordshire County Council and the South Kensington authorities, without putting a penny on the town's rates. To show how much the people valued the school it was only necessary to state that during the last session out of a population of about 25,000 there was an average weekly attendance of over 800 students. Mr. Wilson then proceeded to describe the water supply of the township, which was formerly obtained from the Wolverhampton supply, the agreement being terminated, after litigation, in 1893, by the Bilston Commissioners agreeing to pay the Wolverhampton Corporation the sum of 9,000l. The Commissioners, in accordance with this agreement, promoted a Bill which became law

in 1893 after some slight opposition. In 1895 another agreement was entered into between the two authorities, under which Bilston agreed to pay Wolverhampton the sum of 7,750l. for the right to supply such portion of the Coseley district as was in the Wolverhampton area of supply, and for the mains, hydrants, &c., in the district. The water area for supply now consisted of the township of Bilston, such portion of the Coseley area as was in the Wolverhampton area of supply, and the parishes of Himley, Womburn, Swindon, Trysull, and Woodford. The average daily amount of water pumped was about 840,000 gallons, or about 26 gallons per head per day for all purposes; of this about 5 gallons per head was for trade purposes. The water rate was practically 7 per cent. per annum upon the rateable value. The whole of the works were designed by Mr. Baldwin Latham, and he (Mr. Wilson) acted as resident engineer. In 1892 a test bore-hole was put down 4 in. in diameter and 66 ft. deep, and water was first met with at a depth of 30 ft. below the surface. In October, 1893, a contract was entered into with Messrs. H. Hughes & Sons to sink the well and drive the adits, and they commenced work on January 15, 1894. On June 13 the well was down 134 ft., and the yield of water was 801,700 gallons in twenty-four hours. From then up to August 8 the water could not be got out, and Messrs. H. Hughes & Sons threw up the contract; from that time Mr. John Hughes, their surety, carried on the sinking of the shaft, and on September 3 a third pump was got to work, and the men commenced sinking again on September 10 and went on until September 17, when the pit was down 142 ft.; at this point the pumps were beaten again. The men got to work again on October 9, but failed again on October 15, with the well only 149 ft. deep. It was then decided to sink a second shaft and connect the two by means of headings, and after this was done it was found he still could not go on with the sinking, and it was found necessary to put down their permanent pumps, and allow the contractor to use them in addition to his own; by this means the wells were got down to their full depth, and the headings driven for a short distance, and the brickwork finished in December, 1897, as it at present stands. For the last sixty-seven days upon which it was necessary to pump from the bottom of the shaft, whilst the cast-iron tubing, &c., and the lower portion of the ironwork was got into position, an average of 1,514,044 gallons were raised per day. The shafts were both sunk in a trough in the bunter beds, the particular bed being the upper soft red sandstone, which at the point was about 160 ft. thick. The two shafts were connected by a heading 6 ft. by 4 ft., and 45 ft. long. The steining in each case consisted of the best Staffordshire blue bricks, built in cement mortar, the upper 15 ft. being 14-in. work, and the remaining portion 9 in. The water was carried down behind the walls by means of perforated cast-iron pipes packed round with gravel. The original contract was 3,287l. 10s. 5d., and the cost of the work, including pumping, 6,822l. Of this latter sum no less than 2,208l. 0s. 10d. represented money paid for extra pumping alone. The reservoir was situated at Goldthorn Hall, a distance of 6,617 yards from the pumping station at the Bratch. It was a covered service reservoir only, constructed only of cement concrete with a floated face. The engines at the pumping station at the Bratch were of the vertical triple expansion type, and surface condensing, with the three force-pumps placed directly underneath the crank shaft, and two well pumps, about 140 ft. from the surface of the well. The boilers were Hornsby's water-tube boilers, with about 1,426 square feet of heating surface. They were tested to 200 lbs. pressure, and the working pressure was 145 lbs. to the square inch. The water mains were 2 in., 3 in. and 4 in., with hydrants, sluice valves, and air valves. The mains had to carry an average pressure of 160 lbs. on the square inch. For the prevention and detection of waste he had divided the whole area into eight separate districts, each controlled either by a Deacon, Siemens, or Kennedy water-meter. The total cost of the water undertaking to date was 60,564l. 18s. 10d., and with the engineer's charges, manager's house, and other items, the total cost would not be much under 70,000l. The previous cost was 6d. per 1,000 gallons; the first year's cost of their own supply 4½d. per 1,000 gallons.

Mr. J. S. Pickering (Nuneaton) pointed out

that there was a reservoir storage capacity of only one day's supply, whereas it was usually considered necessary to have a storage capacity equal to two or three days' supply. He wished to know whether that was part of the original plan of Mr. Baldwin Latham.

Mr. Price (Birmingham) presumed that the present pumping cost of 2½d. per 1,000 gallons was due to its being a new installation, and that the cost would eventually be reduced to about 1d. per 1,000 gallons. The water seemed rather hard with 10 degrees of permanent hardening, and it was surprising to him that the Council had not gone in for a softening process.

Mr. Clarson (Tamworth) said that at Tamworth they supplied a population of 18,000 with water at a cost for pumping of a little over 1d. per 1,000 gallons.

Mr. Smith (Kettering) wished to know if there was any prospect of the baths becoming a paying concern, taking into consideration the working expenses and payments on capital account. They made some inquiries at Kettering and came to the conclusion that baths would involve a charge upon the rates of 300l. a year.

Mr. Eayrs (Birmingham) pointed out that in speaking of the cost of 4½d. per 1,000 gallons for water they must take into consideration the fact that the undertaking started with an incubus of 16,000l. in the form of payments to the Wolverhampton Corporation. He congratulated Mr. Wilson upon the way in which his contracts had been carried out and the smallness of the extras.

Mr. Wilson, in replying to the discussion, stated that the scheme was got out for Bilston alone, and the Coseley district had since been added, so that when the plans were originally prepared they had a two-reservoir supply. He agreed that it would be advisable to have a larger reservoir supply than at present. With reference to Mr. Price's remark as to the cost of pumping, it was not fair to estimate the ultimate charge from the figures given for the first year. They had to pay scheduled prices for much of the work for some years, and the charges would be less in subsequent years.

The members visited the Springvale steel furnaces of Sir Alfred Hickman, the water-pumping station, and the Technical School. Mr. Harper, Chairman of the District Council, entertained the members to luncheon at the Himley Arms Hotel, and at the conclusion of the proceedings the members dined together under the presidency of Mr. J. T. Eayrs, at the Technical School.

## THE DETERIORATION OF PAPER.

BEFORE the commencement of the present century paper was made almost exclusively of hemp, flax, and cotton; but these substances form but a small proportion of the raw material used by the paper makers of to-day. Almost any description of cellulose can be converted into paper, and consequently the variety of natural substances which can be employed in the manufacture of paper is very large.

As a matter of fact, however, the material now principally employed is wood cellulose obtained from the trunks of forest trees.

It has long been suspected that modern paper is less durable than the paper manufactured in the Middle Ages, and in order to obtain definite information on the subject, a committee of the Society of Arts was formed to investigate the matter. This committee has concluded its investigations, and has now published an interesting report, which can be obtained from the secretary of the Society.

The committee ranges the paper-making fibres into the following four classes:—

1. Cotton, flax, hemp.
2. Wood celluloses (a) sulphite process; and (b) soda and sulphate process.
3. Esparto and straw celluloses.
4. Mechanical wood pulp.

It is found that all grades of paper are liable to disintegration and discolouration; and apparently the Committee is of opinion that the better classes of modern papers are as durable as the Medieval papers.

For book papers required for publications of permanent value, it is specified that not less than 70 per cent. of the fibres of the paper should be of class A; that the sizing should be performed with not more than 2 per cent. of resin, and should be finished with the normal acidity of pure alum; and that the "loading"

must not cause the total mineral ash of the paper to exceed to per cent.

For written documents of value, paper made with fibres of class A only should be used. The paper should be as pure as possible, and should be sized with gelatine instead of with resin.

At the end of the report a précis of the committee's correspondence with publishers and paper manufacturers is published. This correspondence is exceedingly interesting, but is chiefly remarkable as evidence of the very conflicting opinions which exist regarding the quality of modern paper.

### Illustrations.

#### DESIGN FOR ENTRANCE GATES AND ARCHWAY GRILLE.

**T**HIS design, by Mr. John J. Shaw, was exhibited at the Royal Academy of this year.

It is intended that the main portion of the design should be in wrought and chiselled iron, and for certain other parts, such as the wings of the figures, wreaths, &c., an aluminium alloy should be used, as giving a play of silvery colour, and lightening the work, both in effect and in actual weight.

#### THE NEW GALLERIES OF THE MUSEUM OF NATURAL HISTORY, PARIS.

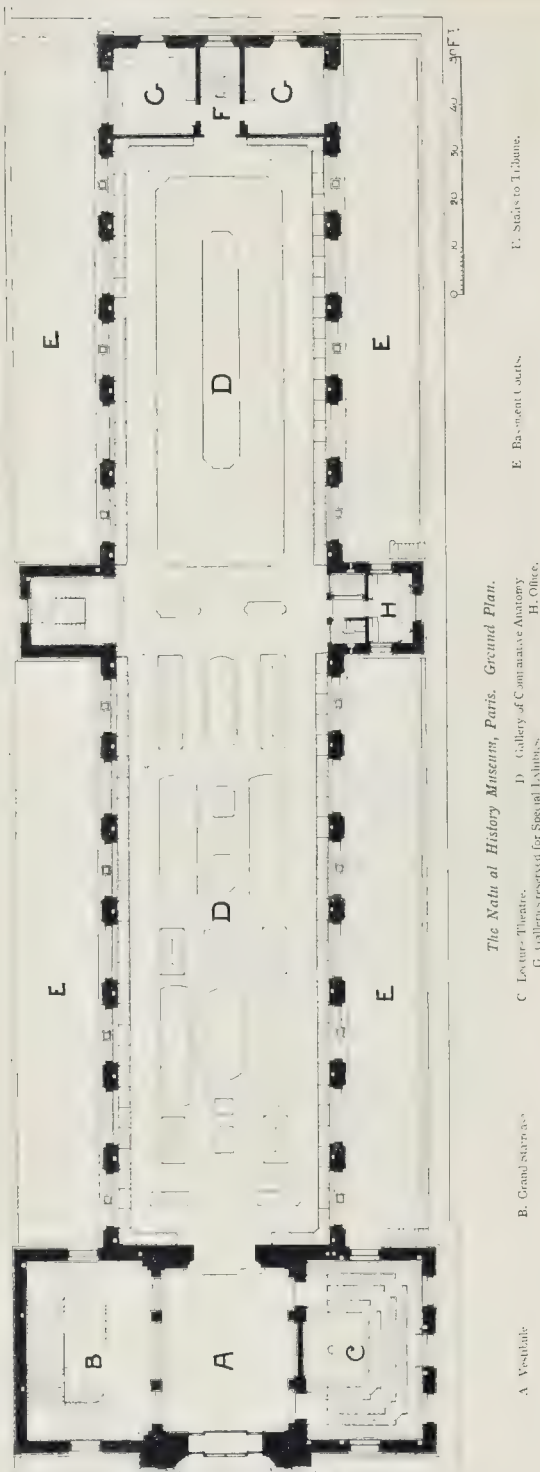
THIS fine building, which has only lately been inaugurated, is due to the talent of M. Dulert, the architect of the famous Galerie des Machines in the Champ de Mars. The Museum, situated in the Jardin des Plantes, may be considered as one of the most original and successful of works of architecture of the present day. The form and aspect of the building, and its decoration, both exterior and interior, is in clear and perfect harmony with the purpose for which the building is intended; the simple and imposing appearance of the monument, which is constructed of red brick and stone, harmonising most agreeably, is relieved by the charming style of decoration, all of which is drawn and composed from subjects of natural history and vegetation, for the chief idea of the architect was to make the decoration the logical expression of the purpose for which the building is intended. The pediments, panels, bas-reliefs, capitals, &c., are decorated with scenes of animal life composed and executed by well-known Parisian sculptors. Tigers and cats are seen climbing along the mouldings surrounding the windows; and insects and shellfish, alternating with clusters of flowers and seaweed, fill the frieze and string courses. The ironwork of the entrance gateways, the staircase and balconies, is composed of ingenious interlacing of plants and animals, and the ceilings of the large rooms are decorated with graceful floral panels.

The plan of the building is simple but well arranged, as may be seen by the plans of the ground floor which is appended; the rooms are well lighted, heated, and ventilated.

The twelve fine decorative panels by M. Cormon, which formed one of the attractions of the last Salon, represent "The conquest of the earth by Humanity" from the earliest times, when man uncultured and unclothed sought his food in the crannies of the rocks on the sea shore, and devoured it in the manner of the wild beast, tearing it apart with his teeth, to later times, when the gradual dawn of civilisation induced man to seek a certain comfort and well-being and interest himself in the primitive arts. In some of the paintings representing the earliest forms of human life, the only half-human being of the Stone Age, M. Cormon has shown a remarkable degree of what may be called historic imagination; but as we are not able to give the whole series, we have preferred to illustrate four of the paintings which deal with man in the dawn of civilisation and the first beginning of arts and crafts; the four representing Hunting, Fishing, Metal-forging, and Pottery.

#### ST. LUKE'S CHURCH, ENFIELD.

THE promoters for building this church are desirous to limit the cost to the lowest amount possible, at the same time the building to be of a substantial character: the chance to be spacious, a Lady Chapel for daily service, and



The Natl. Hist. Museum, Paris. Ground Plan.

F. Stairs to 1st floor.

E. Pa. ment (entrance).

H. Office.

D. Gallery of Comparative Anatomy.

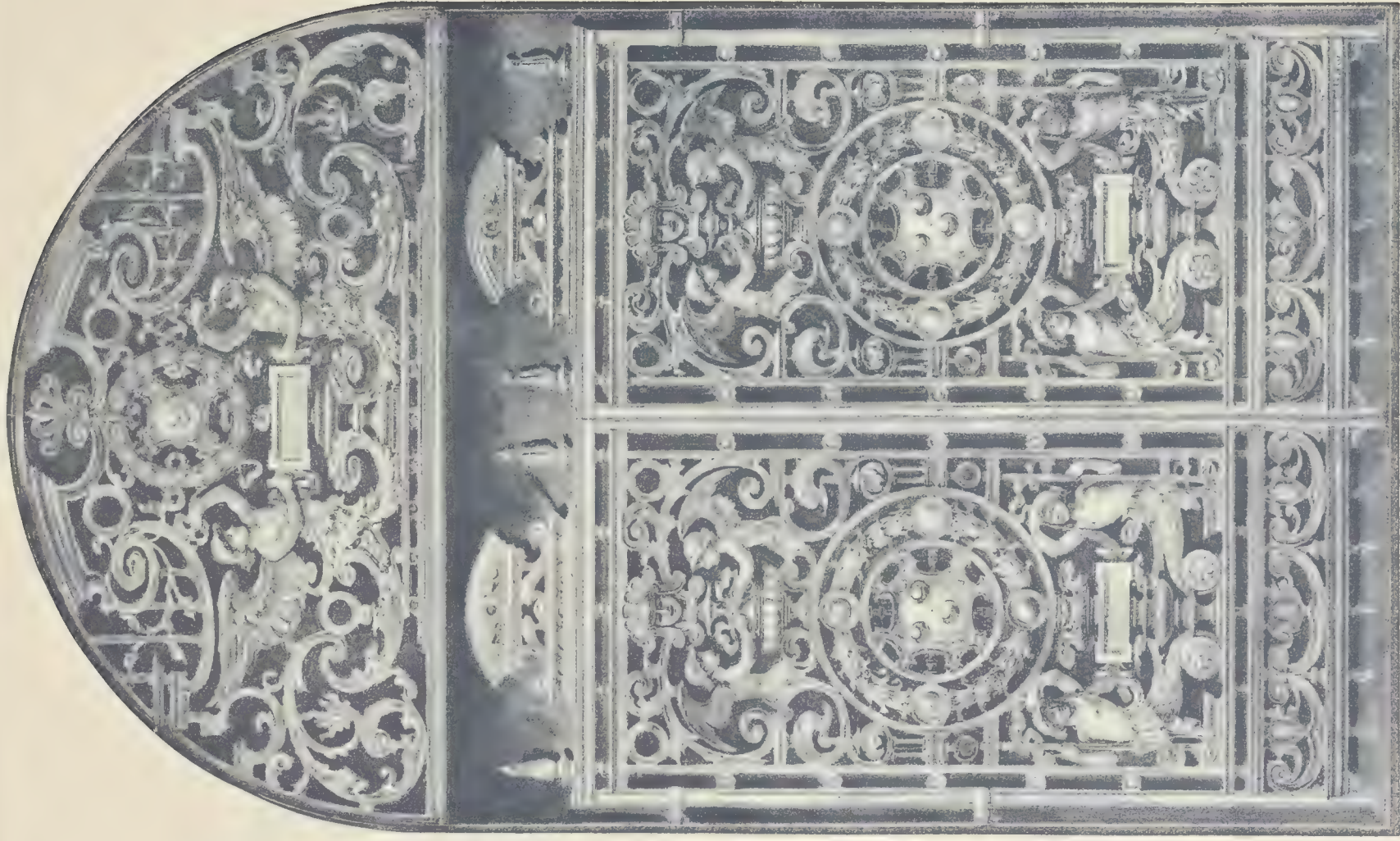
C. Lecture Theatre.

B. Grand staircase.

A. Vestibule.

G. Galleries reserved for Special Exhibitions.

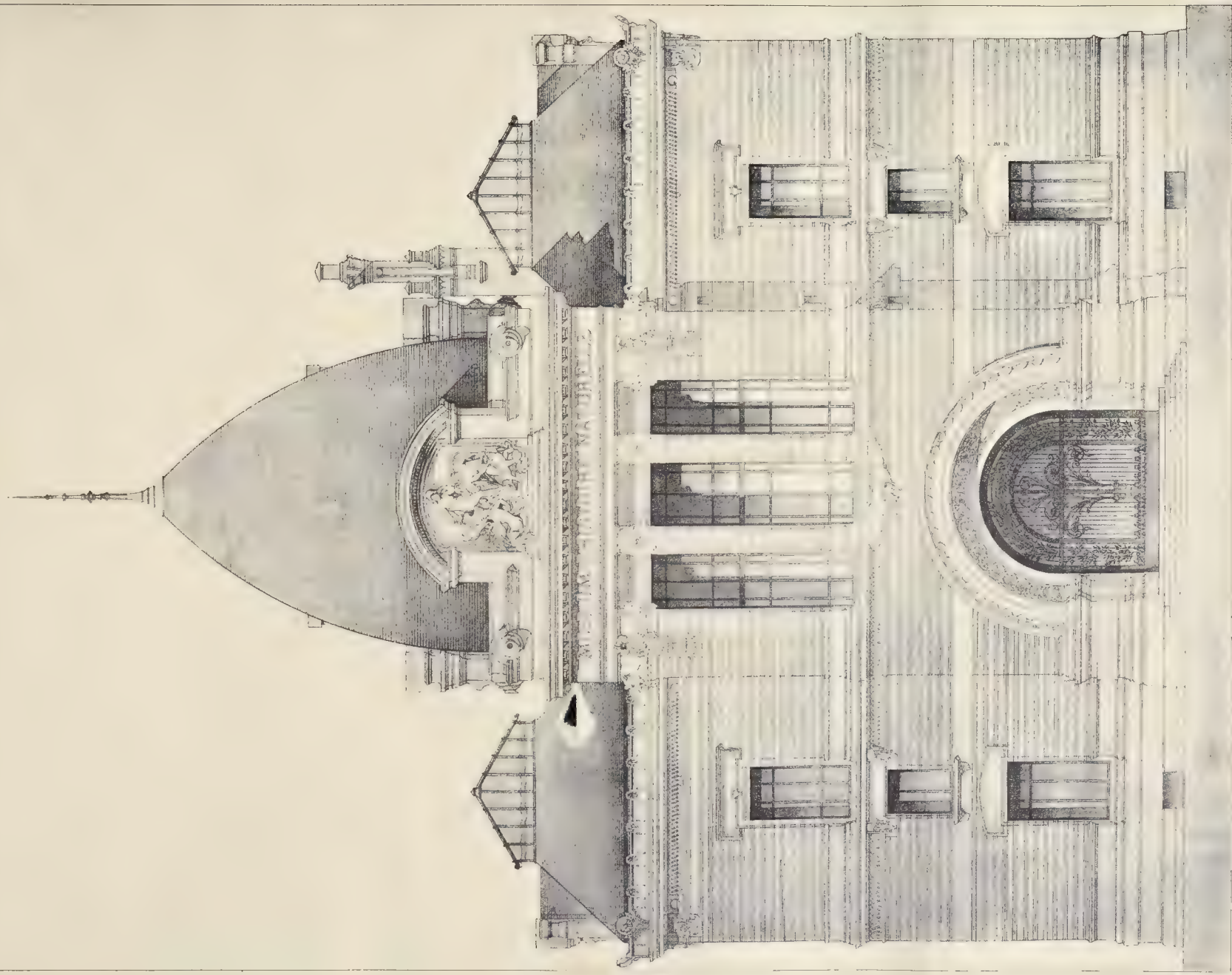




DESIGN FOR GATES.—By Mr. John I. Shaw







FAÇADE OF THE NEW NATURAL HISTORY MUSEUM, PARIS — M. DUTERT, ARCHITECT







HUNTING.



POTTERY.



FISHING.



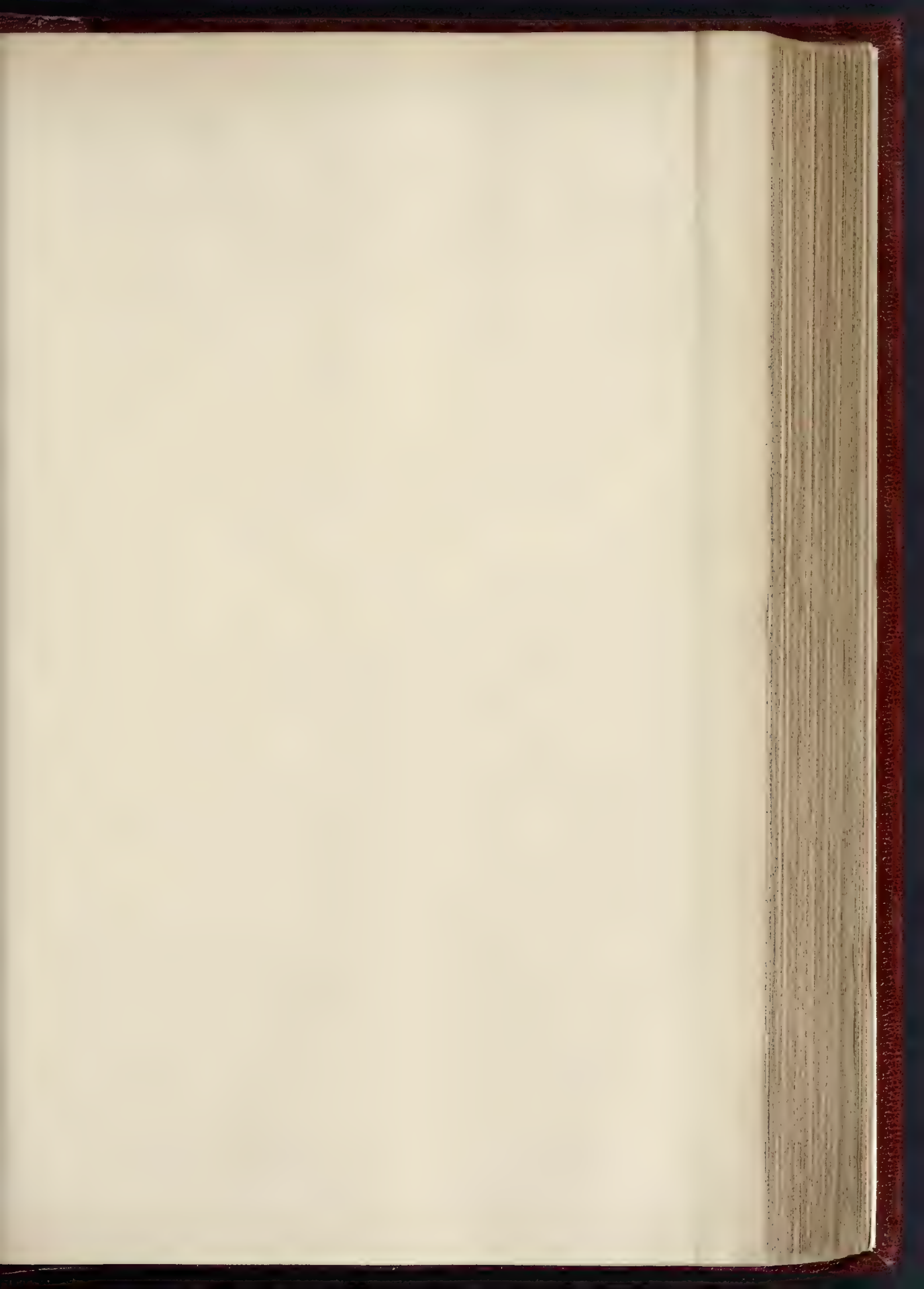
METAL-WORKING.

DECORATIVE WALL PAINTINGS AT THE NATURAL HISTORY MUSEUM, PARIS. BY M. CORNIG.  
 (PART OF A SERIES ILLUSTRATING "THE CONQUEST OF THE EARTH BY HUMANITY".)

THE PHOTOGRAPH BY L. A. & S. EAST-INDIAN, STREET, LONDON, AND L.



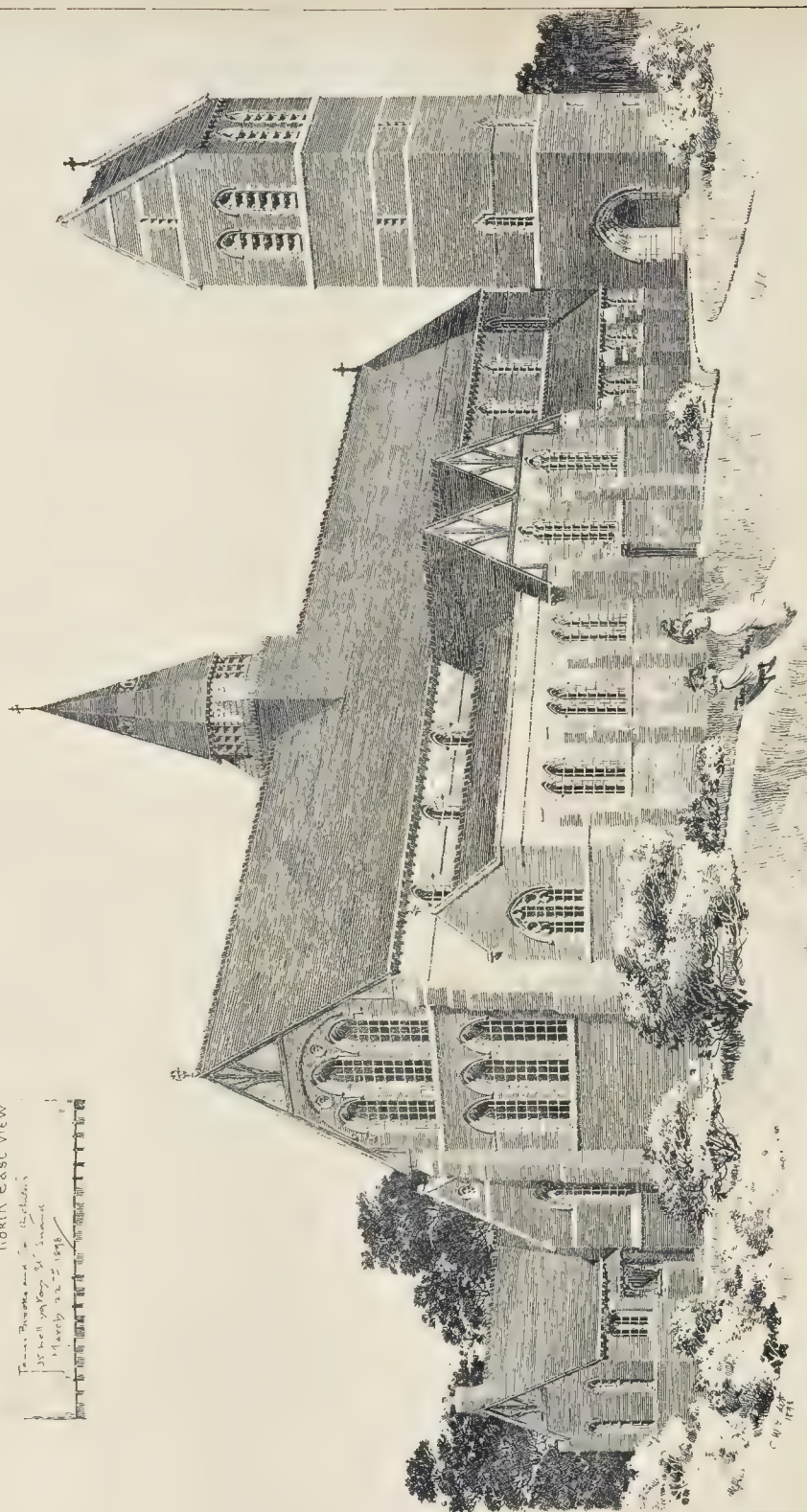




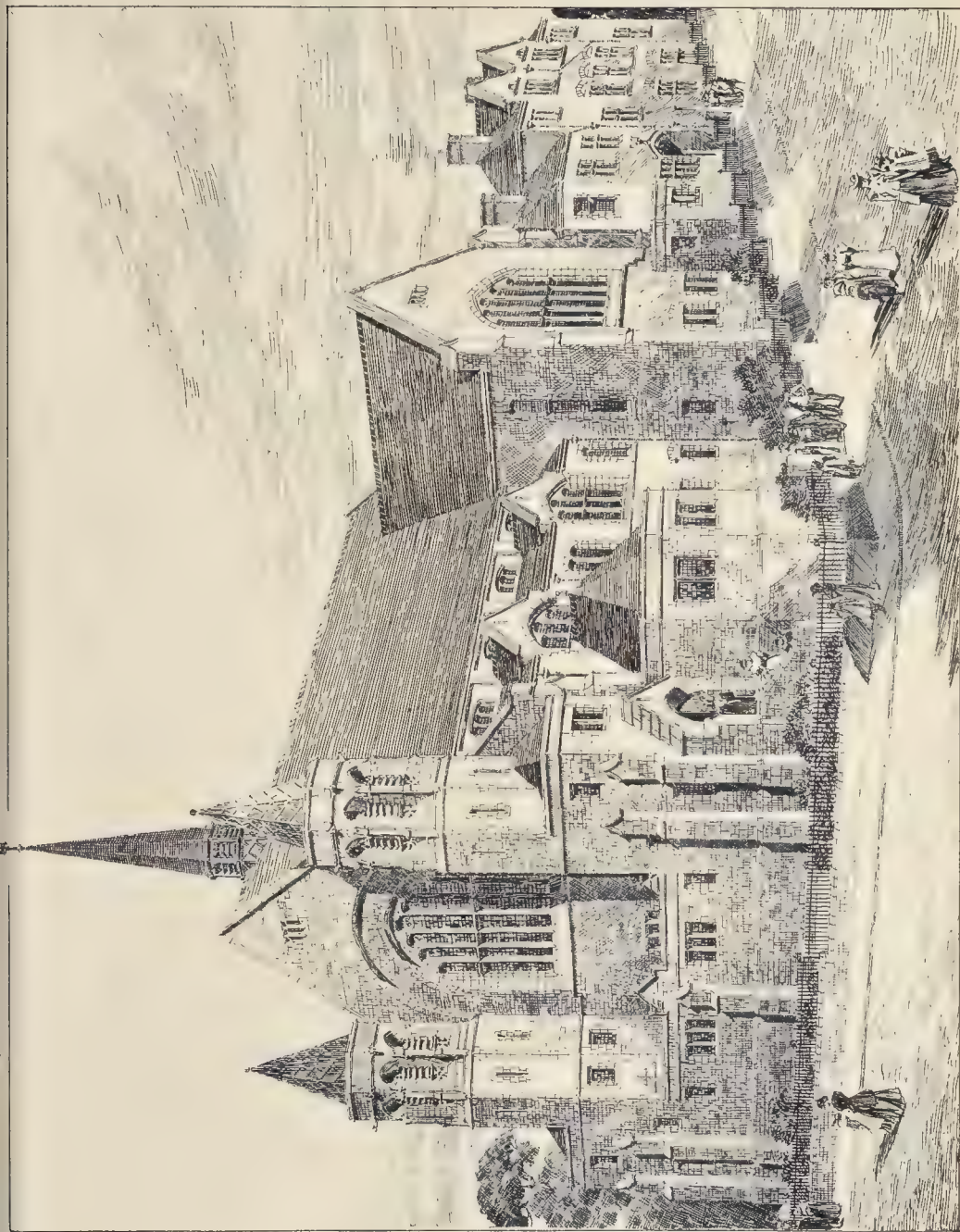
# St. Luke's, Enfield, N.

North East View

Plans by Messrs. J. & J. G. Smith  
35, Wellington Street, London  
March 22nd 1898





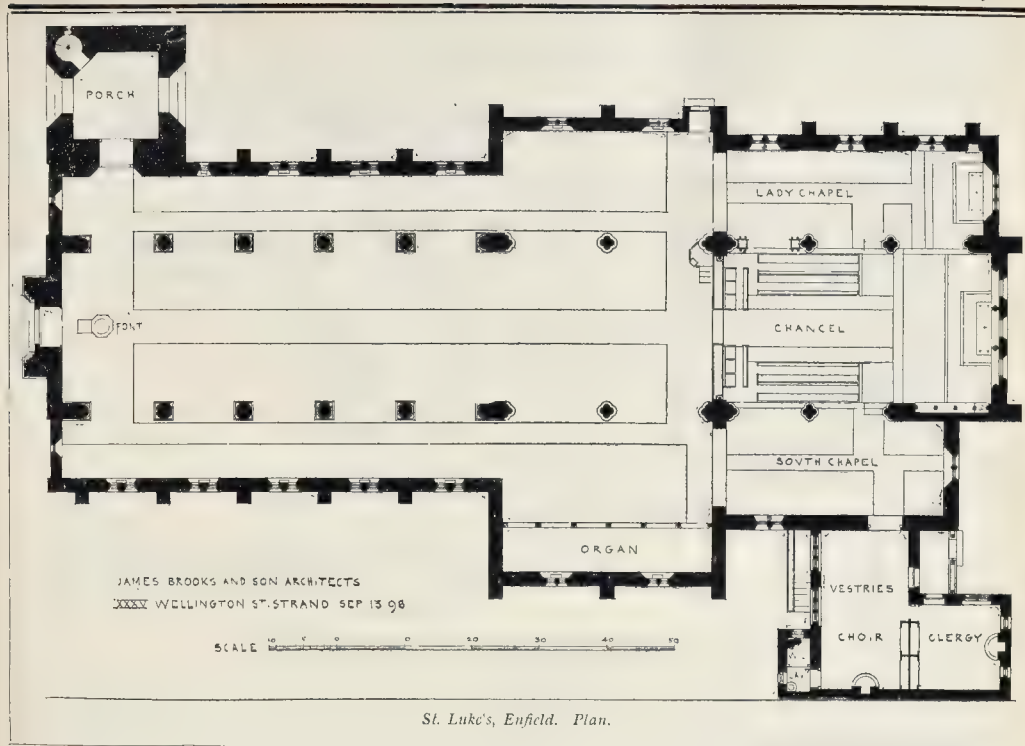


PRINTED BY THE SHARPS & CO. LTD. 485 EAST HARRING STREET, LONDON, E.C. 6

BEECH GROVE CONGREGATIONAL CHURCH AND HALL, NEWCASTLE-ON-TYNE. MR. STEPHEN PIPER, ARCHITECT.







the entire church to give accommodation for about 800; all the seats to be arranged for adults. With such instructions the most simple forms had to be adopted in the arcading, windows, roofs, &c., the height being restricted to meet the small sum to be expended. The church consists of a nave, chancel, and on the north of the chancel the Lady Chapel. On the south is another chapel; the vestries lead out of this chapel. The two eastern bays of nave on both the north and south side form the transepts, the south one projects some feet more than the north to give space for the great organ, the choir organ being placed in the first arch between chancel and Lady Chapel, and the console in the first arch between chancel and south chapel. The tower is planned to be at the north-west angle, and is designed to be erected at a future time without disturbing the use of the church. The bricks for facings, both inside and out, are the Bracknell bricks from Mr. T. Lawrence's field. Bath stone is used, but sparingly on account of cost, for piers, arches, and windows. The roofs are covered with Broseley tiles. A fleche is placed at the junction of transepts and nave to contain the sanctus bell. The entire cost, to include fittings, heating, and architect's charges, is 8,000l. Messrs. James Brooks & Son are the architects. The drawing was exhibited at the Royal Academy of this year.

#### BEECH GROVE CONGREGATIONAL CHURCH, NEWCASTLE-ON-TYNE.

The above building was opened about six months ago. The design was selected in open competition; Mr. Cubitt, of London, being the assessor.

The plan is arranged with the object of accommodating a large congregation in such a way that all may hear conveniently and without any obstruction of view. There is accommodation for 488 persons on the ground floor and for 216 persons in the end and transept galleries; 20 in. is allowed for each person, and the seats are 2 ft. 11 in. centre and centre. Particular attention has been given to the entrances and exits; the ground floor and galleries can be cleared at four different points. Every portion of the building is well lighted, there being a large window over the choir, and the vestibule has direct light over the cloak rooms.

The hall is arranged to be used for lectures, meetings, &c. The galleries over are divided into classes for use as a Sunday-school. In connexion with the hall there are ladies' and gentlemen's retiring rooms, also kitchen, &c. Above these rooms are arranged a large meeting room, ladies' parlour, and conveniences. The caretaker's rooms are over the hall at the opposite end.

A simple treatment of fifteenth century architecture has been adopted, reliance being placed more upon the grouping of the parts, owing to the sum at disposal being limited. The principal feature of the interior is the groined roof at the crossing of the transepts. The external walls and the interior arcading are of stone. The general finishing of the interior is plaster. The roof is divided into panels with moulded ribs and principals, and the spaces filled in with boarding. There is a clouded dado in passages and behind seats. The walls of the choir are panelled in pitch pine. The roofs are covered with green Westmoreland slates.

The windows are filled with tinted cathedral glass in leaded patterns. The vestibule is laid with wood block flooring and the entrances are tiled. The heating throughout is by means of hot water on the low pressure system. The ventilation is carried out by means of air shafts in the roof, communicating with a ventilating turret. The lighting is by electricity. The total cost was 7,900l. Mr. G. H. Mauchien, of Newcastle, was the contractor, and Mr. Stephen Piper, of the same place, the architect.

#### COMPETITIONS.

THE VICTORIA TOWN HALL, SINGAPORE.—The following awards were, on July 30, 1898, made by the Diamond Jubilee Permanent Memorial Committee, Singapore, on the plans received by them for competition for the proposed Town Hall. The first premium of 200l. was awarded to Messrs. Francis Sills, A.R.I.B.A., and W. A. Francken, A.M.I.C.E., of Norfolk-street, Strand, London; the second premium of 100l. to Mr. William A. Tunstall, of Colombo. The plans (Design A) of Messrs. Swan & Maclaren, of Singapore, are highly commended. The plans of Messrs. R. L. Sevenoaks and D. G. Lavelle, A.M.I.C.E., of Bangalore, India, are commended.

ST. PANCRAS BATHS.—The Vestry of St.

Pancras on Wednesday considered a report by the Baths' Committee in reference to the applications invited by advertisement from architects who have had experience in designing and carrying out public baths and wash-houses, and who are willing to submit designs for the proposed new baths to be built in the Prince of Wales-road. The committee mentioned that thirty-six applications had been received, and that on a show of hands the following six were chosen as having, in the opinion of the committee, the best qualifications for this class of work:—Thos. W. Aldwinckle, 1, Victoria-street, S.W.; R. Stephen Ayling, Parliament Mansions, Victoria-street, S.W.; Harnor & Pinches, 5, John-street, W.C.; l'Anson & Co., 7A, Laurence Pountney Hill, E.C.; F. J. Smith, Parliament Mansions, Victoria-street, S.W.; Spalding & Cross, 15, Queen-street, E.C. The committee recommended that the foregoing architects should be invited to compete for the new baths and washhouses, and this proposal was agreed to. The Vestry were also asked to invite the President of the Royal Institute of British Architects to communicate the names of three gentlemen competent to advise the Vestry on baths architecture, for the selection of one for the appointment of assessor to advise and report on the designs that are to be submitted. The recommendation was unanimously adopted.

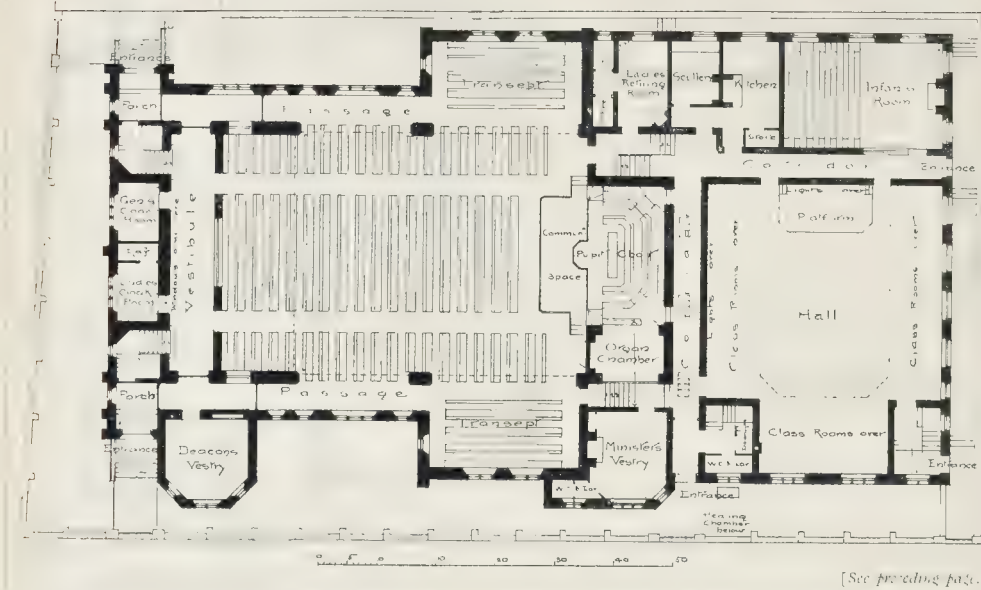
#### ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.—This Association is offering to students (and associates not in practice, nor yet twenty-five years of age) a first prize of 2l. 2s., and a second prize of 1l. 1s., for the best set of drawings or "Testimonies of Study," as required by the Royal Institute of British Architects, to be submitted for their final examination. Similar prizes will also again be given for the probationary work for the intermediate examination. The Association is thus giving important help to the objects of the Institute.

NEW TOWN HALL, COLCHESTER.—The Local Government Board has sanctioned the borrowing by the Town Council of Colchester of sums amounting to 34,136l. for the provision of a Town Hall and public offices. The buildings are estimated to cost 35,500l.

## Congregational Church

Beech Grove · Newcastle-on-Tyne ·



[See preceding page.]

## ARCHÆOLOGICAL SOCIETIES.

**SUSSEX ARCHÆOLOGICAL SOCIETY.**—A party of members of this Society visited Michelham Priory on the 19th inst., when Mr. H. Michell Whitley gave some account of the history of the edifice. The *Sussex Daily News* reporting the visit states that in the course of his remarks the lecturer said that the priory was founded in the early part of the thirteenth century by Gilbert de Aguilu, of Pevensey Castle, Lord of the Eagle, and the last Lord of Pevensey of his race. The foundation was for Austin Canons or Black Canons regular of the Order of St. Augustine. Gilbert gave to the Priory his lordship of Michelham, his Park of Pevensey, comprising between 800 and 900 acres, meadow lands, &c., timber for their church and buildings, and the churches of Hailsham and Leyton. Here upon a rich soil they erected their Priory buildings, which they surrounded by a moat, with the Decker, a great common, on the west and a forest on the north. The entrance gateway, which was almost intact, dated from the latter part of the fifteenth or the early part of the sixteenth century. It was approached by a bridge of solid masonry, a timber bridge or drawbridge reaching over the gap now spanned by the small arch. He did not think that a regular drawbridge, with chains, as at Hurstmonceux and Bodiam, had ever been used, but probably there was a light bridge which could be raised whenever necessary. Below the gatehouse was a room said to be a dungeon, but he thought it was more probably used as a cellar; while above the archway were two rooms in the tower with fireplaces, which were worthy of inspection. The almonry and guest-house for poor people probably stood on the bank at the north-east of the gatehouse, where numerous remains of buildings had been found by Mr. Gwynne. At all events, they stood somewhere in the outer court, and were an important adjunct to the Priory. That building itself, standing back from the gatehouse, was an Elizabethan house, about two-thirds of which had been pulled down to the ground, and to the third which remained had been added a building with mullioned windows, which was not a part of the original priory. Around a square known as the Cloister Garth stood the conventual church and buildings. In 1398 the latter were spoken of as in a ruinous condition, some in part having actually fallen down; and again in 1478 the two mills belonging to the priory were in utter ruin, and the dormitory house with other

houses and buildings was in a bad condition. Extensive repairs must have followed, however, for in 1535 the buildings were returned as being in good order. With the aid of a plan the lecturer indicated the probable position of the various priory buildings. The church, which in this instance, he thought, was situated to the north—his theory being that the position of the church was determined largely by the slope of the ground and questions of drainage—was aisleless and cruciform, with a central tower. On the east side of the cloister garth were the sacristy, a slype to the infirmary and the monks' cemetery, the chapter house, the regular parlour for conversation, and the warming house, where the brethren might have a fire, the dormitory for the canons being overhead on this side; on the south was the frater and kitchen, and on the west the cellarer building with the abbot's chamber.

## Books.

*Lincoln, the Cathedral and See.* By A. F. KENDRICK, B.A. London: George Bell & Sons. 1898.

**IT** is an objection to any uniform series of volumes dealing with many subjects, however similar those subjects may be, that great and small must be treated at very much the same length. The subject must, in fact, be fitted to the number of pages, a serious inversion of the proper procedure. This incidental and unavoidable difficulty is felt even in such popular handbooks as "Messrs. Bell's Cathedral Series," and one can imagine some enthusiastic admirers of Lincoln Cathedral feeling hurt that the account of it should be put into a volume of about the same size as that given to, say, Chester or Rochester. They need not, however, fear. The structure and its story have in this case suffered in no way; the incidental matter, which in some of the other volumes is considerable, is here confined to a list of bishops, occupying but five pages; all the rest is given to the history and description of the building, and Mr. Kendrick tells his tale with discriminating appreciation and an amount of literary skill that makes the historical chapter, at any rate, as "readable" as a romance.

Lincoln Cathedral has more claims upon the interest of both the architect and the archaeologist than most. The exceptional beauty and variety of its Early English details, its beautiful

"angel" choir, its peculiar Galilee and curious west front especially appeal to the former; while the fact that its history rests upon clear and abundant documentary evidence, and reveals some things that would otherwise hardly be credible, attracts the latter. The author only follows most observers in condemning the design of the west front of the building, but we think he thereby makes a mistake. It is, no doubt, only "a screen," and it no doubt also cuts off the bases of the west towers; but in itself it is a fine piece of scenic architecture, with a breadth, a richness, and a grandeur exceedingly rare. He seems disposed to accept Parker's startling theory that St. Hugh's choir was originally covered with a wooden ceiling, and that the walls and piers were thickened when the vaulting was inserted, a theory which Mr. Parker rested on facts susceptible of a simpler explanation, and which practical architects cannot see their way to accept, notwithstanding that if the peculiar twisted vaulting is original, it is probably the earliest fully developed Gothic vault in the country, and, to say the least, an odd "conceit" for a man who was attempting such work for the first time. Mr. Kendrick quotes Viollet-le-Duc, the late Precentor Venables, and other authorities to show that St. Hugh's Early English work is purely English in design and execution; Viollet-le-Duc says there was nothing of the sort in France until thirty years later; but the plan of St. Hugh's apse recovered by Mr. Pearson in 1886-87 is too French to bear out this theory in its entirety. That the detail and workmanship are purely native there can be no doubt, but the plan seems obviously inspired from abroad. Mr. Kendrick acknowledges his indebtedness to the late Precentor Venables, whom he frequently quotes; it was his researches, mainly, that brought its records to light and made them accessible; he studied the building so long and so thoroughly that he almost attained to that sixth sense which comes to those who have spent half a lifetime in solving architectural problems; and it is to him we all owe much of what we know about Lincoln Cathedral.

*The Phyllades of the Ardennes compared with the Slates of North Wales.* Part I. By T. MELLARD READE, F.G.S., and PHILIP HOLLAND, F.I.C. Liverpool: C. Tinling & Co., Victoria-street. 1898.

This pamphlet, forming the first part of a work describing the slates of the Ardennes and



North Wales, is more interesting, perhaps, to the geologist and chemist than to the architect, although Mr. Mellard Reade is well-known as an architect in Liverpool. It is a reprint from the "Proceedings of the Liverpool Geological Society" for 1897-98. The memoir is in great measure a compilation of the researches of Professors Renard and Gosselet so far as the Ardennes phyllades are concerned; but much original matter, mainly of a petrological and chemical nature, is added by the authors. So far as the work has progressed, it cannot be said to be exhaustive, the number of phyllades and slates compared being few; neither are the original petrological details of a very advanced character. The authors are careful to describe their method of chemical analysis adopted, which is useful. Material for the work was prepared by crushing the specimens of slate in a steel mortar and sifting the crushings, which were afterwards reduced to the requisite fineness in an agate mortar. The powder so obtained was dried in 100 deg. C., and preserved in corked tubes. Mere moisture was not ascertained, but was estimated to be from three- to four-tenths of one per cent. in some specimens. For the combined water, the plan was to strongly ignite in a current of dried air, and to collect and weigh the water so expelled. Crushed rock free from dust served for specific gravity estimations, which were obtained with the pycnometer. The general scheme of analysis is then outlined.

Perhaps the most interesting part of the work to us is the table of chemical analyses at the end. The Welsh slates selected show a range of silica remarkable for its narrow limits, though two specimens from Penrhyn yielded 57.75 and 63.01 respectively, with a more constant proportion of alumina at 16.44 and 16.28 per cent. The authors observe that the specimens having the highest percentage of silica is amongst a class reckoned to be the strongest and most durable for roofing purposes, and more resistant to the weather. It is also stated that this slate is proved to be very siliceous, both by chemical analysis and the microscope, and we notice that in the table the percentages of silica as quartz are given, which is a step in the right direction. The proportion of ferric oxide reaches as high as 10.84 in one of the purple Penrhyn slates, and all examples analysed showed the presence of titanic oxide, magnesia, potash, and soda. An American slate from Vermont was found to possess as much as 3.62 per cent. of lime, with a corresponding proportion of carbonic acid. But we need not enlarge on the results, which bear evidence of having been carefully ascertained. We congratulate the authors on the results of the first section of their work, and trust that future parts will contain more information of a truly petrographical nature, together with some physical attributes of the slates dealt with. If, at the same time, the quality of the materials can be discussed from the architects' standpoint, so much the better—though we are perfectly well aware that this is foreign to communications prepared for geological societies, as these latter are at present constituted.

*Geology for Beginners.* By W. W. WATTS, M.A., F.G.S. London: Macmillan & Co., Limited. 1898.

As a work dealing with the elements of geology from a purely philosophical standpoint this is excellent; but the attempt made to treat of the practical applications of the science is sketchy and worthless. However, we like the plan of the first part of the book, which leads the student from the known to the unknown, somewhat after the Lyellian method. Familiar objects are selected for examination. A piece of granite is taken in hand, for instance, and its constituents examined, at first in a very elementary way, and afterwards in a more finished manner. Even at the commencement the microscope is made use of, a method much to be commended. Granite is then compared with other types of rock, all being treated alike. The general statements made are sometimes of a loose character, as for example, in the paragraph headed "Limestone" (p. 17) where the beginner is told that that rock "at first seems to be crystalline like granite," which appearance does not by any means apply except to a limited section of limestones. Again, limestone is made "of fragments of animals such as live on the sea bed," which does not take into account fresh-water limestones, nor those of chemical origin, nor that common building stone, oolite. Of course, the author knows

better, and, in a subsequent chapter dealing with "classification," puts the matter right enough; but even preliminary generalisation must have "saving clauses." The "Study of Rocks out of Doors" is a charming chapter, and, like all other parts of the work, is excellently illustrated. The sections devoted to physical and dynamical geology are simple and to the point, and one of the best chapters in the book is that dealing with "Minerals." The author is strong on igneous rocks, consequently they are described at some length; we question whether some parts are not too advanced for the "beginner." The micro-section photographs are too small to convey an adequate idea of the structure of most of the rocks depicted.

The chapter on fossils is useful and well balanced, except in regard to the vertebrata, which are dismissed in a short paragraph. That portion of the book dealing with stratigraphical geology leaves much to be desired, especially in regard to the Eocene; it is information to us that the "clays, loams, and pebble beds of the Reading series are of estuarine character near the town of that name, but become marine near Woolwich." We are glad to observe that the author omits to mention the so-called "Oldhaven and Blackheath" series. In regard to the historical portion, the names of many of the fossils depicted are incorrect, but we cannot enter into that matter here. It seems hopeless to make the petrographer appreciate palaeontology.

The "Origin of Landscape" is a useful elementary outline of the effect of the weather in producing different types of scenery; and the concluding chapter deals with "Economic Geology"—after a fashion.

*Applied Geology. Part I.* By J. V. ELSDEN, B.Sc. (Lond.). London: The Quarry Publishing Company, Limited. 1898.

It is premature to say how far this work will be useful to practical men, as so little appears in this first part that is not of interest merely to students of elementary geology. As the author points out, "these preliminary chapters scarcely give an adequate idea of the scope of the completed work." We presume, however, that, as the articles are appearing in *The Quarry*, they will have special reference to the requirements of stone owners and quarrymasters. The work is clearly written, and bears evidence of having been carefully compiled.

*The Oxyrhynchus Papyri: Part I.* Edited with translations and notes. By BERNARD P. GRENFELL and ARTHUR S. HUNT. London: Kegan Paul & Co., Bernard Quaritch, Asher & Co., and Henry Frowde. 1898.

THE discovery of an immense hoard of Egyptian papyri in the winter of 1896-7 by Messrs. Grenfell and Hunt, working for the Egypt Exploration Fund, has been the occasion of the founding of a new branch of that society for the exploration of the Græco-Roman remains in Egypt, and the publication of the wonderful collection already in their hands. It was in the rubbish mounds of the ancient city of Oxyrhynchus that the hoard of waste papyri was unearthed. This city is now marked by the village of Behnesa, lying about 120 miles south of Cairo, on the edge of the western desert. It was from the earliest times the capital of its nome or province; and later, as a Christian city, was renowned for the number of its churches and monasteries. The papyri found number over two thousand in fair preservation, besides innumerable fragments, and range from the first to the seventh century A.D. Probably the best account of this unrivalled discovery is that printed in the annual Archaeological Report of the Society for 1896-7.

Messrs. Grenfell and Hunt have published in this volume the Greek text of two hundred and fifty-eight papyri, more or less complete, with an English translation. The general interest of this collection of ancient documents, mostly private or business letters, in regard to social interest, can hardly be over-rated, even in this small selection from the number of papyri found. We are brought face to face with the private affairs and private feelings of people of the early centuries of the Christian era, their manner of doing business, their complaints about being unfairly treated, their invitations to dinner, &c. One's curiosity is raised to the highest degree as to what more may be forthcoming from the rest of the papyri have been made out and edited.

So far, the information in regard to subjects with which we are specially concerned is not extensive. There are various letters about sales of land and division of property; not much about building work. There is one from two builders addressed to two municipal officials of Oxyrhynchus, asking for a payment on account for materials for the repairs of the Baths of Hadrian, followed by another from joiners who had been engaged in executing "Kasiotic woodwork" in a new street, in reference to which the editors state that *Kasiov*, near Pelusium, gave its name to a certain style of woodwork which was first made there. The letter unfortunately gives us no hint as to the nature or style of Kasiotic woodwork. An agreement (A.D. 55), for the sale of a house in Oxyrhynchus, is interesting from the way in which the purchaser, Tryphon son of Dionysius, is identified by a personal description, as in a passport, and the property by the enumeration of the bounding streets. There are one or two papers in connexion with one Flavius Apion, who seems to have been a person of importance—an undertaking of a mason to transport two hundred blocks of stone to Apion's estate for a cistern, and an acknowledgement given to the heirs of Apion by some one who seems to have been a farm tenant, of the provision for him by the landlord of a new axle for his water-wheel, which was to last seven years; "and the old one has been given to the porter." One wonders to what use the porter put the old axle.

Perhaps the most delightful thing in the volume is a letter from a boy to his father complaining that the latter would not take him (the boy) to Alexandria when he had occasion to go there, and threatening that "I won't write a letter or speak to you or say good-bye . . . that is what will happen if you don't take me. Mother said to Archelaus, 'It quite upsets him to be left behind.'" This is a letter of the second or third century. It is evident that boys have not altered much in sixteen centuries or so.

#### TRADE CATALOGUES.

MR. W. DUNCAN TUCKER (Tottenham) sends us his illustrated catalogue of English-made joinery, mouldings, sash-bars and horticultural prepared timber. This latter department includes sections of purlins, rafters, &c., specially prepared for greenhouse and hothouse work. The catalogue also includes a great number of sections of architrave and panel mouldings, cornices, handrails, and electric light mouldings, with drawings of framed doors kept in stock or ready to put together.—The Carbotron Heating Co. (Derby) send an illustrated catalogue of their Carbotron portable stoves, for their patent fuel "Carbotron," which is defined as "a chemical compound which gives out neither smoke, smell, nor fumes, and burns with little draught; whatever gases are generated are absorbed or neutralised by passing through the steam in the basin on the top of the stoves." This appears to promise a stove that will not require any connexion with a flue. We have not seen it in operation, and can therefore only give the statement of the makers. It seems to be worth attention.

#### Correspondence.

To the Editor of THE BUILDER.

##### NEWARK PRIORY.

DEAR SIR,—On visiting the ruins of Newark Priory, near Weybridge, last week, I came upon what I consider is an object of some antiquarian interest, and therefore venture to write you on the subject. The ruins are approached from the main road from Pirford, and it is necessary to cross two meadows to gain access to them. Near the gate to the second meadow is a rough bridge over the ditch, and on one side, forming part of the bridge, is what appeared at first sight to be a piece of rough stone, but, on closer examination, turned out to be the lid of a stone coffin or sarcophagus, with an incised Latin cross on it. I had not much time to examine it closely, but I think that possibly the coffin lid may be in marble. It is about 7 ft. long and 2 ft. 6 in. wide, and has probably been in this position for many years, and has been covered with earth, but, owing to the recent very dry summer, the stone has become exposed. The ruins are in the parish of Send-with-Ripley, Surrey, and stand on a spot formerly called "Aldebury." The Priory was also called Newstead, or "De Novo Loco," and was founded by Ruald de Calva in the reign of Richard I. for the Canons of the Augustinian



Order. The south wing of the transept and three bays of the choir, all in the Early English style, remain, and a portion of the nave. The south gable of the transept seems likely to fall, and would be a good object for the consideration of the Society for the Preservation of Ancient Buildings.

I hope that the stone may eventually find a more suitable resting-place than it now enjoys.

W. HILTON NASH.

#### "A SANITARY ANACHRONISM."

SIR.—With reference to the letter from Mr. Norman Wight, under the above heading, in your issue of the 3rd inst., I think, if he will look again at the picture entitled "Making a Marriage in the Olden Time," in No. 2 of *Harmworth's Magazine*, he will see that the pipe on the roof is intended to be a rain-water pipe and not a soil-vent pipe. In old houses, such as the one given in the illustration (which I enclose), I have often seen rain-water pipes fixed in this way to conduct the water from a centre gutter or flat through an adjoining roof to the nearest outlet or rain-water head instead of having a pipe brought down the centre of the house, and in some cases the water has been brought through the roof by means of a trough-gutter, the open end of which has terminated at the tiles and its contents allowed to run down them to the eaves gutter beneath.

In the picture one of the old-fashioned lead rain-water heads is shown, and into which the rain-water pipe appears to discharge, the down pipe of which is probably built in the wall or hidden by the creeper.

\* \* \* As shown in the picture the pipe could not act as a rain-water pipe unless it is supposed to come through the roof from some gutter on a higher level behind, of which however there is no indication in the engraving. Perhaps the painter of the original picture (Mr. A. T. Vernon) can explain.—E.D.

### The Student's Column.

#### SOUND, LIGHT, AND HEAT.—XIII.

##### SOUND: REFLECTION.

**W**E now approach a very important section of our subject, having special reference to the reflection of sound. It is this which has chiefly attracted the attention of architects, as a prime acoustic phenomenon in buildings. The most useful work printed in England relating to the matter is the little treatise by Professor T. Roger Smith,\* which is excellent, so far as it goes. Then we have a good *résumé* of what is known concerning acoustics of buildings, by Mr. H. W. Burrows in a paper read before the Institute,† and memoirs by other authors, of more or less value. Atkinson deals with reflection, echoes, and resonances in his usual masterly style in "Gano's Physics"—"so that, all round, there is no lack of information on this aspect of sound.

It is well known from experiments carried out on several occasions, that so long as sound-waves are not obstructed in their motion, they are propagated in the form of concentric spheres; but, says Atkinson, when they meet with an obstacle, they follow the general law of elastic bodies; that is, they return upon themselves, forming new concentric waves, which seem to emanate from a second centre on the other side of the obstacle. This phenomenon constitutes the reflection of sound, which is subject to the two following laws—

(a) The angle of reflection is equal to the angle of incidence.

(b) The incident sonorous ray and the reflected ray are in the same plane perpendicular to the reflecting surface.

In general, the laws of the reflection of sound are the same as those for light and radiant heat, which will be more particularly referred to later on in this series. They may be demonstrated by similar experiments. Sounds are also, to a limited extent, subject to deflection in the sense that certain of the rays, having been cut off by some obstacle, others passing beyond the obstacle tend to spread more widely. Suppose the obstacle to be a wall, a person standing behind and immediately underneath it would not catch as much of the sound as a person standing behind but some yards away from the wall. The former individual would be described as being within the sound-shadow. A great deal depends, however, as to whether the sound emitted has one direction impressed upon it or whether it is travelling radially.

Professor Roger Smith, referring to the phenomena of reflection, remarks that when a

ray of light falls upon any polished body it is reflected very little diminished in amount or altered in quality. In other cases, however, the light is considered to be partially absorbed, and the remainder is given off by different bodies in different degrees, each throwing off such rays of light only as indicate its own colour and absorbing the others, and every object upon which the light shines thus in turn irradiates light. To a limited extent the same thing occurs with sound. It is also reflected by some bodies and irradiated in the form of sympathetic vibrations by others, and it requires a certain hardness of surface to do either. Whatever the essential difference between those surfaces which do and those which do not reflect light may be, the distinction between bodies that merely reflect sound, and those that, if they reflect it partially, also reinforce it by sympathetic vibration, is that the latter are highly vibratory and the former are not.

Although the angle of reflection is equal to the angle of incidence, that is only true within certain limits. Mr. Scott Russell showed,\* with reference to waves of water, that when they strike a plane surface at a more acute angle than 45 degrees, they are not perfectly, and when at one more acute than 30 degrees not at all perceptibly reflected, but appear to travel along the bank or other surface against which they had struck. Sound-waves act in a similar manner, hence we have the phenomenon of conduction. Again, Herschel notes that a sound might be expected to be conveyed with less diminution along a wall than in the open air, the trough or angle between the wall and the ground forming, in fact, two sides of a square pipe.

From the foregoing, the student will have more clearly perceived the necessity for special construction in wainscoting as outlined in the last two articles of this series. But there is this further point to be considered, namely, the condition of the surface of the wall, for as we know it requires a certain hardness of surface either for successful reflection or reinforcement. As to how the surface is to be treated depends in a great measure on the size and shape of the hall or room; in some cases it is absolutely necessary to weaken the sound to compete with reverberation, whilst in others it is desirable that the speaker's voice shall be assisted artificially, as previously noticed in our observations on resonance.

Before alluding to certain materials that have been employed to bring about either the one or other of these results, let us glance for a moment at the origin of echoes. Atkinson puts the matter very tersely (p. 218). He observes that an echo is the repetition of a sound in the air, caused by its reflection from some obstacle. A very sharp, quick sound can produce an echo when the reflecting surface is 55 ft. distant; but for articulate sounds at least double that distance is necessary, for it may be easily shown that no one can pronounce or hear distinctly more than five syllables in a second. Now, as the velocity of sound at ordinary temperatures may be taken at 1,125 ft. per second, in a fifth of that time sound would travel 225 ft. If the reflecting surface is 112½ ft. distant, in going and returning sound would travel through 225 ft. The time which elapses between the articulated and the reflected sound would therefore be a fifth of a second, the two sounds would not interfere, and the reflected sound would be distinctly heard. A person speaking with a loud voice in front of a reflector at a distance of 112½ ft. can only distinguish the last reflected syllable; such an echo is said to be monosyllabic. If the reflector were at a distance of two or three times 112½ ft., the echo would be dissyllabic, trisyllabic, &c.

In the first few decades of the present century it was generally understood that a parabolic form of the walls and ceiling was suitable for throwing off sound, rendering it more distinctly heard. A moment's consideration suffices to condemn the method, however, if we only note to what uses the parabolic reflector is put to in more recent times. Take, for instance, an employment already noted, in connexion with the photophone. There, the sensitive selenium cell is placed in the centre of the paraboloidal receiver in order that the latter shall, on collecting the rays of the soniferous beam, project them on to one point to get the greatest accumulative effect. Now, if instead of a small reflector a very large one be

constructed, and a speaker be placed in the same relative position as the selenium cell in the form of photophone mentioned, it will be apparent that the reverse must happen—namely, that the exciter is enabled to partially throw the sound-waves, so to speak, against the reflector, which, in its turn, throws them off in definite directions. This leads to great augmentation of sound, but the speaker must, to get the loudest effect, stand in a definite position, and as the sound is to be thrown out he ought to stand with his back to the audience, provided only the part included in the stage or platform is in the reflector. If the speaker faces the audience he himself gives the prime direction to the sound, which is not, of course, backwards, but outwards and away from the reflector. It follows, therefore, that although the latter can get but very little of the sound to deal with, and most of that is by reflection from other surfaces in front of it, in a large hall that would only tend to increase echo. At the same time there are many instances of such reflectors having been employed.

The problem is an interesting one, and we may go further into it. The practical experiences of the Rev. John Blackburn have frequently been cited in this connexion. In the year 1829 that gentleman wrote\* his experiences with reference to his church at Attercliffe, near Sheffield. The church had been newly built, the area of the interior was a rectangular parallelogram, 95 ft. by 72 ft., with an elliptical recess at the east end, 10 ft. deep and 32 ft. in width; the roof was vaulted and groined, and the highest point of the ceiling of the nave about 56 ft. from the floor. It is mentioned that there were galleries at the sides and west end. The resonance in the church was found to be very powerful, but the sound was so confused that the speaker could not make himself understood. Naturally, the first thing to suggest itself to remedy matters was to change the position of the pulpit. After experimenting with this, but little improvement resulted, so an ordinary flat-sounding board was brought into requisition. This had the effect of discharging most of the sound to a position not wanted, namely, the front seats. He then had recourse to a parabolic reflector, and remarks that the desired object was to convey a distinct sound to remote parts of the church. Under the impression that this might be attained by intercepting so much of the sound as escaped behind and echoed in this part of the vaulted roof, as also by giving it a right direction, and conceiving that a parabolic figure might be so applied as to answer these ends, he made the trial, which proved highly successful. After the reflector had been fixed, people in the end galleries could hear even better than those near the pulpit.

The success attending the introduction of this parabolic reflector was such as to induce several other clergymen to utilise the same method, and many other equally good results followed. Then came the reaction, which has led us to remark the unsuitability of this form of reflector. As Professor Roger Smith observes, when the reflector came to be more extensively tried, it was far from being so universally liked as its success at first seemed to render probable. Indeed, judging from the circumstance that that at Attercliffe was subsequently pulled down it may be doubted whether even that really proved an unqualified success. The great objections to the use of the parabolic reflector beyond those already mentioned were that the speaker heard the echo of his own voice dinning into his ears in a most bewildering manner, whilst he was also liable to be molested by hearing the little sounds produced among the audience down to the whispers of the occupants of the furthest part of the church, collected and reinforced until the slightest of them were audible. This proved an intolerable nuisance, and the parabolic reflector was placed under a cloud.

The same phenomena witnessed by the selenium cell, only in the above case practised on the preacher instead, are recalled by these experiences. It appears that the reflector is more useful in a long narrow building than in a wide one, though that must, of course, in some measure depend on the width of the mouth of the reflector. The last-mentioned author, in summing up the virtues and defects of this method of augmenting sound, remarks that though the general results seem to show that whilst a powerful means of throwing forward the voice in one direction is unques-

\* "Acoustics in Relation to Architecture and Building; the Laws of Sound as Applied to the Arrangement of Buildings." New Edition, 1895.

† R.I.B.A. Journal, vol. ii., 3rd ser., 1895, pp. 355 et seq.

\* "Report on Waves." British Association Report for 1844, p. 54.

\* Transactions Society of Arts, vol. xviii. (1830-31.)



tionably within our reach wherever these reflectors can be applied, the number of instances in which they can be of real use must, of necessity, be very limited. A parabolic reflector should never be introduced as part of the structure of a building, but should be movable.

If this form of reflector has not proved itself to be uniformly successful in propagating sound, it has been found useful under certain circumstances in preventing the transmission of sound, as recorded many years ago in the columns of this journal.\* The officials of a prison in the United States found that prisoners could communicate with each other by means of the air-flues belonging to the ventilating apparatus. There were two such flues in each cell, one for the inlet and the other the outlet. Two enlargements were made in these flues 10 ft. apart, and in each of them was fixed a reflecting surface in the form of a paraboloid made of earthenware—the result was highly successful, as sound was effectually prevented from passing.

### OBITUARY.

MR. H. J. WHEATLEY.—We regret to record that Mr. Wheatley, who was well known to the London building trade as the Secretary to the Builders' Clerks' Benevolent Institution, has died from the result of having been accidentally knocked down by a cyclist at Stoke Newington Green on the 10th inst. He was found to have sustained a fracture of the skull and concussion of the brain, and died two days after the accident. He had been utilizing in his efforts, for the twenty years that he had acted as Secretary, to promote the interests of the Institution with which he was connected, and, as we are told in a letter from their Acting Secretary, "the Committee feel that they have lost not only a very efficient officer but a good friend."

### GENERAL BUILDING NEWS.

**SCHOOL BUILDINGS, MOTHERWELL, N.B.**—The buildings recently erected by the Dalziel School Board, at Motherwell, near Glasgow, and which are intended as a school for secondary education and technical purposes, were recently opened by Mr. R. B. Haldane, Q.C., M.P. The building is situated at the junction of Airbles and Glencairn streets, and consists of two storeys, but advantage is taken of the natural fall of the ground to the back, where an additional basement floor is obtained. On this floor are arranged the several workshops for engineers, joiners, and plumbers, besides a physical and a metallurgical laboratory. From the basement there is a stair leading to the upper floors, so that access to the workshops can easily be obtained from the class-rooms. This section of the school will, in the meantime, be used for elementary classes. The public entrance to the school is from Airbles-street, where there is a circular porch resting on Doric columns. This leads through a wide passage to the examination hall, which is placed in the centre of the building, and capable of seating 300. This hall is only one storey in height, and is lighted from the roof. A well-lighted corridor runs all round the central hall, so that the light of the class-rooms is not disturbed when the hall is in use. There are seven class-rooms on the ground floor for the secondary department of the school. The cookery kitchen, washing-room, and laundry are also placed on the floor, apart from the class-rooms. In connexion with this section there is a demonstration hall, which is so planned that it can be used either for cookery or laundry work. The girls enter from Glencairn-street and the boys from the south side, and the cloak-rooms and lavatories are placed near the entrances. The upper floor is divided into a science section and an art section, separated from each other by corridors. The science section has a large fitted up laboratory for the study of the sciences, a balance-room and a preparation-room attached. There are six special fume-closets, and the fumes from the working benches are extracted by means of motor fans placed in the ceiling. In connexion with this section there is a lecture hall, capable of seating 200 students. This is fitted up with lecture-table and other apparatus for the purposes of science teaching. There is also a class-room for the study of the sciences, the rooms devoted to art are, for lighting purposes, planned with a northern aspect, and consist of rooms for mechanical drawing, elementary drawing, advanced drawing, painting, and modelling, also a room for the art master, all arranged *en suite*. There are two rooms for music, well isolated from the other class-rooms. The rooms are finished in the plainest manner possible; no plaster cornices are used, and the iron beams are left exposed. The only places where any effect has been asked for are in the corridors and staircases. The exterior has elevations to Airbles and Glencairn streets. The

lecture hall is given the prominence to Airbles-street, and is emphasised in the composition by a range of Ionic columns, flanked by plain wall surfaces. The contractors were:—Mason, Robert Park, Motherwell; joiner, Wm. Chambers & Co., Motherwell; slater, John Bertram, Strathaven; plumber, James Parker, Motherwell; plasterer, Hugh McLean, Motherwell; tile layers, Staffordshire Tile Company, Glasgow; heating, Jas. Cormack & Sons, Glasgow; glazing, W. Meikle & Sons, Glasgow; painting, Alexander Kemp, Motherwell. The masons were Messrs. Duff & Henderson, Glasgow. Mr. James Dempster, Motherwell, acted as clerk of works. The architect was Mr. Alexander Cullen.

**SEA-BATHING STATION, ABERDEEN.**—The new wing, containing twelve plunge baths, sitz, and Russian baths, has now been finished. The walls are of Ruban compressed bricks, and the baths are of the most modern type. The total cost of the station has been 10,000l. Mr. John Rust, Aberdeen, is architect.

**CONGREGATIONAL CHURCH, MEERSBROOK PARK, SHEFFIELD.**—Foundation stones of the church being erected at Meersbrook Park, Heeley, Sheffield, were laid on the 13th inst. The site is at the junction of Chesterfield and Beeton roads, adjoining the old building, which will be used as a school. The scheme provides for the removal of the existing iron church, and for the erection in its place of a permanent school with class-rooms. The new church will provide accommodation for 500 persons, with choir seats for thirty in a chancel recess. A gallery, capable of containing 200 more, may be added if required. There are vestries, with lavatories in the rear. The lecture-room adjoining the iron church will accommodate fifty or sixty persons. The church is being built of red brick, with Matlock stone dressings. A chief feature in the design will be two turrets, for ventilating purposes, flanking the entrance. The contract price is 3,100l. Messrs. Hemmell & Paterson, of Norfolk-row, Sheffield, are the architects.

**GRAMMAR SCHOOL, SHEPTON MALLET.**—On the 14th inst. the foundation stone of the new grammar school buildings, Shepton Mallet, was laid. The edifice will have accommodation for 60 boys, will contain the school-room, 45 ft. by 21 ft.; class-room, 25 ft. by 16 ft.; hat and coat room with lavatory, 16 ft. 6 in. by 13 ft. 6 in., with the master's residence attached, containing study, dining-room, and pantry, with kitchen and necessary offices on ground floor, and four bedrooms and bath-room on second floor. The whole building occupies an area 83 ft. in length, and 54 ft. in depth, and is built with bastard freestone, with Bath freestone dressing on the external face. There is also a workshop, latrines, and cycle house detached at rear, with a frontage of 50 ft., and built with the same material. The cost is estimated at 2,282l. The builder is Mr. S. Dodgins, of Shepton; the County Surveyor, Mr. Willcox, is the architect.

**SCHOOL OF ART, POKESDOWN, HANTS.**—On the 14th inst. a memorial stone was laid at the Science, Art, and Technical School buildings now being erected in Christchurch-road, Pokesdown. The ground floor will contain a public entrance hall with separate side entrance for pupils, and a large hall capable of seating 400 to 500 people. On the upper floors will be a chemical laboratory, and rooms for the art students. The materials being used are red Bridgwater bricks relieved by blue Staffordshire bricks and Bath stone. The builder is Mr. T. Head, and the architect Mr. James Morley.

**CONGREGATIONAL CHURCH AND SCHOOLS, MORTON, PETH.**—A memorial stone was laid on the 22nd inst. in these buildings, which, in addition to the church, school, and infant class-room, has a ladies' parlour, and rooms for a caretaker. The cost of the whole, land included, is estimated at 2,700l. Mr. J. W. Taylor, of Newcastle-on-Tyne, is the architect.

**BOARD SCHOOLS, SMETHWICK.**—On the 16th inst. a new girls' school and pupil teachers' centre, erected by the Smethwick School Board in Crockett's-lane, were opened. The builder was Mr. J. Harley, and the architect, Mr. F. J. Gill.

**NEW SCHOOLS, KESWICK.**—The new High School at Keswick was opened on the 16th inst. The cost of the buildings was about 6,000l. The contractor was Mr. Isaac Hodgson, and the architects were Messrs. Austin & Paley, of Lancaster.

**PARISH CHURCH, BELLAHUSTON.**—New transepts and a chancel were opened in this church on the 18th inst. The architect for the additions was Mr. W. F. McGibbon, of Glasgow.

**CHAPEL, RHYDDINGS.**—The memorial stone of a Calvinistic Methodist chapel at Rhyddings has just been laid. The new building, when completed, will seat 700 people. The contract is held by Messrs. J. & F. Weaver, Manselton, from the designs of Mr. P. J. Thomas, architect, Bridgend.

**POLICE OFFICE, PAIGNTON, DEVON.**—The police buildings now being erected in Paignton are nearly finished, and will be occupied in a week or two. The building faces Palace-avenue, on which it has a frontage of over 70 ft., with an additional frontage on a side road of about 100 ft. They consist of sergeants', single and married constables', and public quarters, sessions room, cells, &c. The heating is by means of a Kennell improved superheated-boiler. The contract is for about 3,500l. Messrs. Dart & Pollard are the contractors, and Mr. E. H. Harbottle, of Exeter, the architect.

**CHURCH, SHOTTON, NORTH WALES.**—On the 14th inst. the foundation-stone of a church at Shotton was laid by Mrs. Gladstone. The first part of the edifice to be built will consist of the nave, south aisle, chancel, and chapel (the north aisle and tower being left for future extension). Seating accommodation will be provided for 570, and the cost, including the site, will amount to 5,700l. It is designed in the Early Decorated style, from plans prepared by Messrs. Douglas & Minshall, of Chester.

**WORKHOUSE HOSPITAL, MANSFIELD.**—On the 15th inst. a hospital erected in connexion with the workhouse at Mansfield was opened. It is a two-story building to accommodate sixty-eight female patients. There is already an older block of infirmary buildings, erected in 1883, which accommodates about 100 patients, but the new premises have been built to meet increased requirements owing to the growth of the population in the Poor Law district. An adjoining block contains maternity wards and accommodation for the medical and nursing staffs. The new building will be known as the Victoria Hospital. The estimated cost of the whole is 12,000l. The contractors were Messrs. Blake & Beeley, of Mansfield, and Mr. D. Ireson was clerk of the works. The architect was Mr. R. F. Vallance, of Mansfield.

**CONGREGATIONAL CHURCH, CROSBY.**—This new church building was dedicated on the 15th inst. It has been constructed of Runcorn stone, and is early Gothic in style, with a wide nave. There are two transepts, a chancel with choir stalls on each side, and also vestries for the pastor and choir. The principal entrance is by a large porch approaching from Eshe-road, four entrances in all being provided. All the joinery work has been done with pitchpine, and the seats are of the same material. The church is lighted with electricity, and heated by hot water pipes. A two-manual organ, supplied by Messrs. Norman & Beard, of Norwich, has been fixed on the west side of the chancel at a cost of 630l. The builders were Messrs. Hughes & Stirling, of Bootle, and the architects Messrs. Douglas & Fordham, of Chester.

**ADDITIONS TO SCHOOLS, PURLEY, SURREY.**—An addition recently made to the Warehousemen, Clerks', and Drapers' Schools, at Purley, was inaugurated on Saturday, the 17th inst. It comprises a lofty central hall, capable of holding 400 people, and having on either side an extensive range of class-rooms, while underneath the floor of the building, which is reached by an ample staircase, is a large playground. The structure is of red brick and Victoria stone. The cost was upwards of 9,000l. Messrs. J. Kingwell Cole and Kenneth Wood were the architects.

**ACADEMY, KILMARNOCK.**—The new Kilmarnock Academy buildings, though not quite finished, were recently opened. The building has been treated in the Queen Anne style. The central hall is 62 ft. by 26 ft., and has boys' and girls' staircases adjoining, with galleries communicating with the various class-rooms on the different floors. Altogether there is on the ground and second floors accommodation for 868 scholars. On the third floor there is a cookery class-room, chemical laboratory, &c. There are twenty-two class-rooms in all. Among other accessories being provided are a swimming-bath, a workshop, and gymnasium. The architect is Mr. R. S. Ingram, and the builder Mr. A. Calderwood.

**CHURCH, ABERCYNON, WALES.**—The new church of St. Donat's at Abercynon, near Llanwano, has recently been opened by the Bishop of Llandaff. The building affords accommodation for 500 persons, and comprises a chancel, nave, south aisle, and western gallery. The latter is supported by a brick arcade. The church is lined throughout internally with red Cattybrook bricks. The open timber roof is of pitch-pine, not stained nor varnished. The external dressings are of the same bricks, with the exception of the east and west windows and buttress cappings, which are of Douling stone. Owing to the building site being on the side of a hill, there is a considerable space under the nave floor, which will ultimately be utilised for the purpose of a parish-room. The cost was about 3,000l. The architect is Mr. G. E. Halliday, Diocesan Surveyor, and the contractor Mr. Games, of Abercynon.

### SANITARY AND ENGINEERING NEWS.

**BRIDGE, LLANGADOCK.**—It is proposed to erect a bridge over the Sawdde river near Llangadock village. It will be made of steel, of three spans, 45 ft. each, and 12 ft. wide, and has been designed by Mr. Morgan Davies, Swansea.

**ELECTRIC LIGHTING, HANLEY.**—A Local Government Board inquiry was held at Hanley, on the 14th inst., with reference to an application by the Town Council for sanction to borrow a further sum of 4,000l. for electric lighting purposes. The Town Clerk explained that the annual rateable value of the borough was 197,912l., and the balance of outstanding loans was 216,557l. On February 6, 1893, the Corporation obtained sanction to borrow 21,000l. for electric lighting, repayable in twenty-five years. On June 14, 1894, they borrowed a further sum of 1,100l., repayable in ten years; on May 29, 1895, 5,000l., on November 28, 1896, and on July 27, 1897, 14,800l., repayable in twenty-five years. The present loan being part of the general scheme, it was desirable that its repay-

\* The Builder, 1897, p. 618.



ment should be extended over twenty-five years also. They had at present 363 private customers, and these were rapidly increasing. Mr. Cowell, electrical engineer, stated that the private lamps were equal to 25,750 lamps of 8-candle power. They were supplied from four feeders, and it was wanted now to put down a new high-tension feeder to supplement these. Owing to the great demand in the evening the tension dropped to 94 volts, whereas the minimum allowed was 97. It was also explained that the Council wished to take advantage of the ground being opened for telephone purposes to lay down some new low-pressure distributing mains. The present application was to meet the estimated requirements during the next twelve months.

**WATER SUPPLY, CHESTERFIELD.**—On the 16th inst. a Local Government Board inquiry was held at Chesterfield, with respect to an application by the Rural District Council for sanction to borrow money for the purposes of the scheme for the extension of the northern water-supply system. The inquiry was also relative to an application by the Dronfield Urban District Council for sanction to borrow 5,180l. Mr. E. M. Eaton, Consulting Engineer, in explaining the scheme, said the authority had already control of 2,000 acres of gathering ground for the purposes of the northern water-supply, but they were very deficient in reservoir storage. The Barbrook watershed was the most prolific gathering ground. The Barbrook drainage area, down to the lower of the two existing reservoirs, was 1,310 acres, of which the scheme now suggested was intended to deal with 1,028 acres. The available rainfall for the drainage area he estimated to be a little over 15 in. The total yield of the 1,028 acres would amount to 991,000 gallons a day, but that would involve a very much larger storage than they needed, or had ground to construct, so that they had taken it upon the probable requirements of the district for a reasonable period in advance, and the capacity of the intended reservoir was made a little over 71,000,000 gallons. The existing works, with the contemplated additions, would give a supply for the next twenty-five or thirty years. In addition to the 71,000,000 of storage, they had a service reservoir at High-lane, Mosborough. The water from the Barbrook area was very peaty, and they had had a difficulty with regard to lead poisoning. It was proposed to neutralise the carbonic acid in the water by a layer of broken chalk in the reservoir, which would prevent the action on the lead pipes which led to lead poisoning.

**ELECTRIC LIGHTING AND STREET WORKS, BRIGHTON.**—At the Royal Pavilion, Brighton, on the 14th inst., a Local Government Board inquiry was held into the proposal of the Town Council to borrow 56,300l. for purposes of electric lighting and 1,750l. for street improvement. The Town Clerk explained that the amount proposed to be borrowed for electric lighting included the probable expenditure for two years. The loan for street improvement was required for the purpose of improving the south side of Madeira-road. The necessity for this had arisen through the washing away of the Chain Pier, which left a gap in the frontage. It was proposed to extend the retaining wall in front of the Aquarium eastward.

**SEWAGE WORKS, CHADDERTON.**—The new sewage purification works at Chadderton, constructed from the designs of Mr. James Diggle, C.E., Heywood, were formally opened on the 17th inst. The site, situated at Slacks Valley, contains 15 acres, and the total cost of the disposal works and the sewage scheme has been 30,000l., of which 50,000l. has been expended on sewerage.

**BRIDGE, GILSLAND, CUMBERLAND.**—On the 20th inst. a number of members of the Cumberland County Council inspected the stone bridge over the Irthing at Gilsland, which has recently been completed. It is built on the skew principle, and has cost about 1,400l., including road diversions. The builder was Mr. T. Teller Laughton, and the engineer Mr. C. J. Bell, County Surveyor.

#### STAINED GLASS AND DECORATION.

**WINDOWS, ASTBURY CHURCH.**—A large five-light window and two smaller ones in the chancel of Astbury Memorial Church, Handsworth, near Birmingham, have recently been filled with stained glass. The work was designed by Mr. T. W. Camm, and executed at his studio, Smethwick, Birmingham.

**ST. PAUL'S, GOSWELL-ROAD, E.C.**—This church, built by the late Mr. Ewan Christian, is now undergoing thorough internal cleaning, and decoration in gold and colour, with a large painting in the east end of the church representing "The Lord's Supper." In fact the whole building will be painted from top to bottom. The work is being carried out by Messrs. Percy Bacon & Bros., of Newman-street, W., under the direction of the architect, Mr. Romaine Walker.

**MEMORIAL WINDOW, MALTON.**—A memorial window placed in St. Michael's Church, Malton, has recently been dedicated. It represents "The Sermon on the Mount," and was executed by Messrs. Clayton & Bell, of London.

#### FOREIGN.

**FRANCE.**—The iron foot-bridge designed by MM. Reval and Alby, to serve for the construction of the Alexandre III. bridge, has been placed in position. The sketch for the monument to Gounod to be placed in the Parc Monceau is completed. Three figures representing Mirelle, Marguerite, and Juliet, surround the pedestal, on which is the bust of the composer, and against which is shown a piano with a figure of the Genius of Music playing on it; a not very happy thought. The house of the late painter, Gustave Moreau, is shortly to be opened to the public as a museum. At Jargeau, on Sunday last, a monument to Jeanne Darc was inaugurated, which was the last work of the late sculptor Alfred Lanson. M. Osiris is about to completely restore the Château de Malmaison, which he is going to present to the State, and which will form a very curious museum of things connected with the Consulate and the Empire. The jury in the competition for the restoration of the Hôtel de Ville de Besançon have selected M. Lambert, of Paris, as architect for the work. M. Ferdinand Deconde, architect, of Wassy, has been commissioned to undertake the restoration of the facade of the church of Notre Dame in this town, as it is presumed to have existed, according to various documents and sketches, before the fire of 1591. M. Henri Dupray is at work on two large compositions for the Mairie at Vincennes, commissioned by the Conseil-Général, and intended for the grand staircase. One represents the defence of Vincennes in 1870 by the Ecole Polytechnique, and the other, the army of Paris quitting Vincennes to cross the Marne, in 1870, the day of the battle of Champigny. It is probable that the fine monumental group by M. Dalou, "The Triumph of the Republic," of which we gave an illustration some years ago (taken from the full-size model) will be inaugurated on July 14 next year. It is to stand in the centre of the basin in the Place de la Nation. The death is announced, at the early age of forty-eight, of M. Jean Alexandre Pézieux, the sculptor. He was a pupil of Joubroy, Fabich, and M. Tony Noël, and obtained a medal of the third class and travelling scholarship in 1882, and a medal of the first class in 1894. Among his principal works were "Non Omnes Morimur," a marble group belonging to the Paris Municipality; "O Jeunesse," a marble statue in the Musée Galliera, and a figure entitled "Songe d'Avenir," bought by the Paris Municipality from the Salon of 1896, which the artist was engaged in executing in marble at the time of his death.

#### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Mr. W. L. Le Maître, Civil Engineer, of Westminster, has removed his local office at Bristol to Carlton Chambers, Baldwin-street, Bristol.

**ANTIOXIDE.**—Messrs. Peters, Bartsch, & Co. have sent us sample of their Antioxide. It is a transparent varnish which, when applied to steel, protects other metal, protects it from oxidation and corrosion. It is also intended for the protection of painted surfaces.

**CENTRAL SCHOOL OF ARTS AND CRAFTS.**—We have received the prospectus and time table of this school, under the direction of the Technical Education Board of the London County Council, which includes classes for architectural design under Mr. Ricardo, in which the subject is treated from the point of view that architecture should respond to the facts of modern life. Shaded drawing, for architects, conducted by Mr. Chadwick; stone working for architects, by Mr. R. H. Hook; lead work for architects and plumbers by Mr. Troup; stained glass work, by Mr. Wall; modelling, by Mr. E. Roscoe Mullins, &c.

**BATTERSEA POLYTECHNIC.**—This institution has added to its programme classes for instruction in builders' estimates and quantity-taking, under Mr. J. Bartlett. They are divided into elementary and advanced classes. In the elementary class students will receive instruction in taking-off, abstracting, and billing from simple examples. Students joining this class must have passed in technical mensuration and elementary building construction. In the advanced class the method of measurement adopted under each trade will be fully dealt with, and complete examples of taking-off, abstracting, and billing will be given in each trade. Students joining the advanced class must have passed in elementary quantities and advanced building construction. This class will also deal, as far as possible, with more advanced examples, including examples of measurement from building, also adjustment of accounts and formation of prices. These classes will be examined at the end of the session by the Polytechnic, and certificates will be awarded.

**COLLAPSE OF A BUILDING, GOVAN, N.B.**—Through the collapse of a building in Govan, near Glasgow, on the 10th inst. five men were killed and three injured. A year ago a new building of four flats was erected with contact to Govan-road, Napier-street, and Main-street. The upper flats were used as a model lodging-house, and the street flat was occupied by a firm of grocers. The building is understood to be fireproof, all the floors being laid with concrete. It appears that the work of laying

the concrete on the fourth floor was being proceeded with, at about three o'clock, when without any warning, the floor collapsed and fell right through to the ground, crashing through and wrecking the grocer's shop. No cause can as yet be assigned for the accident, as the building appeared to be perfectly sound and substantial.

**PUBLIC WORKS, OLD TRAFFORD, MANCHESTER.**—On the 15th inst. a Local Government Board inquiry was held at the offices of the Stretford Urban District Council into the application of the Council for sanction to borrow 6,000l. for the provision of a Technical Institute and Public Library, and 4,000l. for the purchase of land at Pennington-hall for purposes of public walks and pleasure grounds.

**THE REGISTRATION OF PLUMBERS' AND DOMESTIC SANITATION.**—The Lord Mayor of Manchester presided at a public meeting in Manchester on Monday, at which Dr. Mansel-Howe delivered an address on "The Registration of Plumbers' and Domestic Sanitation." We must, he said, feel that it was upon the efficiency of a system ensuring the qualification of plumbers, and enabling the public to recognise the qualified man, that sanitary plumbing actually depended. The registration of the plumber deserved to come under the recognition and the protection of the law. Mr. Lees Knowles, M.P., said that all parties in the House were committed to the principle of the Bill, the main object of which was to afford additional safeguards to the public health by enabling persons employing plumbers to select, when they desired to do so, those who had given evidence of their qualification for plumbers' work by the law. The Lancashire County Council, in one of their reports, emphasised the fact that the operative plumber was frequently left to carry out most responsible work by himself. They had many precedents for registration, and he could not help thinking that the subject was one well worthy the consideration of any Government. What, however, they wanted was the support and assistance of the general public opinion. The Government required to be stirred up in the matter, and he suggested that the supporters of the movement ought to make a representation to Parliament and explain what their views were, pointing out that it was to the advantage of the country that the Bill should be passed.

**PROPOSED LARGE GRAVING DOCK ON THE TYNE.**—The Newcastle Daily Chronicle states that a special meeting of the Docks Committee of the River Tyne Commissioners was held on the 19th inst., in Newcastle, when a deputation was received from the Elswick Works consisting of two of the principals of the firm of Sir W. G. Armstrong, Whitworth, & Co., Ltd., viz., Sir Andrew Noble and Col. Watts. The deputation had a most important scheme to lay before the committee, i.e., the urging of the great advisability and indeed the pressing necessity of the Commissioners making a large graving dock on the Tyne that should be capable of accommodating the largest battleships, cruisers, and ocean-going passenger liners. Sir Andrew Noble said he considered that the graving dock should have an entrance of 85 ft. width and be 600 ft. to 700 ft. long, with a depth of at least 28 ft. of water at ordinary spring tides. He thought that the Commissioners would take up this special work, the Admiralty might be willing to do some thing to help the scheme, seeing that there was on the north-east coast no place where the largest battleships and cruisers could be docked for the purpose of repairs, &c. In the end, it was agreed that the Docks Committee should hold a special meeting at an early date for the purpose of considering the matter.

**STREET IMPROVEMENT WORKS, BATH.**—A Local Government Board inquiry was held at Bath on the 14th inst. respecting the Urban Authority's application for sanction to borrow 18,000l. in connexion with the London Street improvement scheme.

#### CAPITAL AND LABOUR.

**SETTLEMENT OF THE QUARRIES DISPUTE, ABERDEEN.**—We learn that this dispute has at length been settled; all the men were reinstated on Thursday morning, and the suspension of masons is also concluded. About 500 operatives were affected by it. Of these 150 had up to Saturday last left the city for employment elsewhere, assisted by removal grants from the union. On Monday, at a joint meeting of the Committees of the Master Masons' Association and of the Quarry-owners' Association, Mr. Wright, manager for Messrs. Manuelle & Co., stated that his firm was prepared to regulate the pay at Dancing Cairns Quarry with the other quarries in the district. Should the men accept this, both the quarry dispute and the suspension of masons will be at an end. We understand that the acceptance of these terms led to the termination of the dispute.

**BUILDING TRADE, STAFFORDSHIRE.**—The building trade for the time of the year is exceptionally good, and bricklayers are in request, advertise-



ments for men continually appearing. Joiners are busy, with none out of work. Plasterers are well employed, but they are not so busy as last week. Painters and plumbers are very busy, with no unemployed. In all the brick and tile yards in North Staffordshire great activity exists, the operatives being very busy. At Leek all branches are fairly busy, with a small number on the out of work list. At Stafford stonemasons are also busy. Joiners and bricklayers report a slight decline, with a few out of work.—*Staffordshire Sentinel.*

# LEGAL.

## ANCIENT LIGHT DISPUTE.

THE case of Harding v. The Cleveland House Syndicate, Limited, came before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst. Counsel for the plaintiff said that Mr. Justice Phillimore had, as Vacation Judge, granted an *interim* injunction restraining the defendants from building so as to interfere with the plaintiff's ancient lights. He and his learned friend who appeared on the other side had agreed, subject to his Lordship's permission, that the *interim* injunction should be continued over the next motion day, with liberty to the plaintiff to amend the writ by striking out the word "syndicate" from the defendant's title, which was wrong. There would also be liberty to either side to inspect each other's buildings. His Lordship assented to the application.

## ANCIENT LIGHT DISPUTE: ALLEGED "RUSHING UP."

THE case of Keeble v. Poole came before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., on the application of the plaintiff to restrain the defendant, by injunction, from interfering with his ancient lights. Upon the application of counsel his Lordship directed that the case should stand over, the defendant in the meantime undertaking not to build so as to obstruct or darken the plaintiff's ancient lights as heretofore enjoyed. Mr. Alexander, Q.C., for the plaintiff, said that the defendant had worked day and night to rush up his building, and he, on behalf of his client, intended to ask for a mandatory injunction.

## BUILDING DISPUTE AT ISLINGTON

COUNSEL applied *ex parte* to Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., for an *interim* injunction over the 28th inst. restraining a Mr. Buckle and Messrs. Morley & Lawrence, Limited, from pulling down or otherwise interfering with the walls or structure of No. 257, Upper-street, Islington. The learned counsel stated that his client, demised to Mr. Buckle for a term of years Nos. 257 and 258, Upper-street, and last Thursday he heard from that gentleman (Mr. Buckle) that alterations were being made to No. 257. On the plaintiff sending up to see what the alterations were he found that the shop part of No. 257 was completely gutted, and part of the boundary wall pulled down, the house being thrown into and forming part of the next house, No. 256, in which the plaintiff was not interested. The lease to Mr. Buckle gave him no right to pull down the premises in question. His Lordship granted the application, and gave leave to serve notice of motion for the 28th inst. to continue the injunction.

## ACTION BY THE OWNER OF A BUILDING ESTATE.

THE case of Hutchings v. the Seaford Urban District Council came before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., on the application of the plaintiff, the owner of a building estate at Seaford, to restrain the defendants by injunction from laying a drain across his property, the defendants not having complied with certain provisions of the Public Health Act, 1875. Mr. Vaughan, who appeared for the plaintiff, urged that the defendants had no right to go on private property other than along a road or something of that sort, except they complied with the conditions of the Public Health Act, viz., (1) by giving reasonable notice and (2) by the defendants' surveyor reporting that the work was necessary. Counsel went on to state that neither of those conditions had been complied with. In the result his Lordship refused the application for an *interim* injunction, but reserved the costs till the trial.

## APPLICATION TO RESTRAIN ERECTION OF BUILDINGS.

THE case of Brown v. Sheinman & Volk was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., it being an application by the plaintiff for an injunction to restrain the defendants from erecting buildings so as to interfere with his ancient lights. When the case was called on, counsel for the plaintiff asked that the motion might be allowed to stand over for a week, in order that his client might be allowed to amend the writ and the notice of

motion by adding some more defendants, with leave to serve them to appear on the 28th inst. The present defendants did not offer any objection to the course proposed. The application was accordingly granted.

## APPLICATION TO RESTRAIN ERECTION OF BUILDINGS

THE case of Oppert v. Cochrane and others was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., on the application of the plaintiff for an injunction to restrain the defendants from the erection of certain buildings, &c. When the case was called on counsel stated that it had been mutually agreed that the motion should stand over for a week, certain evidence to be filed on or before the 28th inst. His Lordship assented to this arrangement.

## IMPORTANT ANCIENT LIGHT DISPUTE.

THE case of Coles and Others v. the Salters' Company came before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst. Mr. Mulligan, Q.C., for the plaintiffs, stated that the action was brought by the plaintiffs to restrain the defendants from building so as to obstruct the plaintiffs' ancient lights. Affidavits had been filed, and the position of matters was this—very eminent architects were not agreed. On the affidavit evidence, and subject to his Lordship's sanction, it had been arranged that the motion should stand till the trial, the action to be set down at once without pleadings, but pleadings to be delivered notwithstanding the Long Vacation, with liberty to either party to apply to advance the trial. The learned counsel stated that he should like it to be understood that if the defendants continued to build they would do so at their own risk. Mr. Alexander, Q.C., for the defendants, consented to this arrangement. His Lordship: That seems a very reasonable arrangement for both parties. Mr. Alexander: The costs will be dealt with at the trial. His Lordship: Yes. There will be no *interim* injunction or undertaking as to the defendants' building, but, as Mr. Mulligan says, it will be at the defendants' risk.

## APPLICATION TO RESTRAIN ERECTION OF A WALL.

THE case of Kitson v. Sanderson came before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., on the application of the plaintiff to restrain the defendant from erecting a wall so as to obstruct his (plaintiff's) ancient lights. Upon the case being called on counsel for the plaintiff stated that the case was practically settled, but both parties wished that the motion might be allowed to stand over for a week in order that terms might finally be arranged. The application was granted.

## ALLEGED INFRINGEMENT OF ANCIENT LIGHTS AT SURBITON.

THE case of Philpott v. the Surbiton and Long Ditton, &c., Society, Limited, was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 21st inst., it being an application by the plaintiff to restrain the defendants from the erection of a building so as to obstruct his ancient lights. Upon the case being called on, counsel for the plaintiff stated that negotiations were in progress between the parties with regard to a settlement, and by the consent of both sides he asked that the case might be allowed to stand out of the list formally, with liberty to either party to apply to have it reinstated. His Lordship allowed the application.

## MEETINGS.

### SATURDAY, SEPTEMBER 24.

*London and Provincial Builders' Foremen's Association.*—Monthly Meeting, 7.30 p.m.  
*British Institute of Certified Carpenters.*—Visit to Eton and Windsor.  
*Institution of Junior Engineers.*—Visit to Sir David Salomon's Workshops.

### TUESDAY, SEPTEMBER 27.

*Sanitary Institute.*—Congress at Birmingham. Inaugural Address by Sir Joseph Fayer, 8.30 p.m. Opening of Health Exhibition by the Mayor, 8.30 p.m.

### WEDNESDAY, SEPTEMBER 28.

*Edinburgh Architectural Society.*—Honorary President's address.  
*Sanitary Institute.*—Congress at Birmingham. Conference, 8.30 a.m. and 2 to 5 p.m. Reception of the Mayor of Birmingham, 8.30 p.m.  
*President Institution of Builders' Foremen and Clerks of Works.*—Quarterly Meeting of Directors, 8 p.m.

### THURSDAY, SEPTEMBER 29.

*Sanitary Institute.*—Congress at Birmingham. Meeting of Sections to 2 p.m. Lecture by Dr. Childs, 8.30 p.m.

### FRIDAY, SEPTEMBER 30.

*Sanitary Institute.*—Congress at Birmingham. Meetings of sections, to 2 p.m.; closing general meeting, 5 p.m. Popular lecture by Dr. Hill, 8.30 p.m.

### SATURDAY, OCTOBER 1.

*British Institute of Certified Carpenters.*—Mr. J. Clark on "Graphic Statics applied to Carpentry Structures." 6 p.m.  
*Sanitary Institute.*—Congress at Birmingham: Excursions.

## RECENT PATENTS:

### ABSTRACTS OF ACCEPTED SPECIFICATIONS.

#### Open to opposition until October 31.

[1897] 19,969.—**VENTILATING APPLIANCES:** *J. Leather.*—At or near one end of an opening into the room or space to be ventilated are arranged certain directing plates, and at or near the other end a series of similar plates disposed radially or nearly so to a centre upon which the series moves; the plates may be partly solid, or perforated, and adjusted to cover or close passages between any two of them; they are operated by cords and pulleys, hooks, or otherwise.

22,586.—**GLAZING FOR ROOFS, DOMES, FRAMES, WINDOWS, &c.:** *J. R. Carlisle (deceased).*—For this invention, which is applicable to curved as well as to flat glass sheets is employed, where a horizontal joint has to be made, a strip of lead, or composition, of an H section or approximately of that section, and sufficiently strong to replace the supporting bar or strip commonly used; in the case of a vertical joint is employed a wooden or metal bar or strip to which is secured another strip of lead, or of composition, above which latter is another strip of T or similar section adapted to hold the edges of the glass on the flat lead strip, the two strips being screwed or secured to the bar; the T strip or cover piece is preferably of a section that has its greatest thickness in the middle. The novelty lies in the use of strips heavier and stronger than those commonly adopted, the combination of a bed plate with a heavy cover plate abutting against the bed plate centrally, the combination with a vertical or principal joint sufficiently strong to form the roof of a horizontal or lateral joint, whereby a bar or rafter is dispensed with, and the combination with a bed plate, a strengthened cover plate secured thereto related to receive the glass, and forming the vertical or principal joint, of a horizontal or lateral joint of H section.

22,761.—**MACHINE FOR SWEEPING CHIMNEYS:** *Annie Messenger.*—The brush is attached to a wire rope carried over a pulley in the top of the chimney, the ends of the wire rope being secured to the ends of two ropes fastened to two drums, or to one drum in such a manner that when the drum or drums rotate one rope is paid out as the other is drawn in. Other pulleys or rollers are placed in relation to the operating drums that they guide the ropes into the line of pull; a handle rotates the drums, and the frame is shaped to close the stove's whole front.

23,265.—**WINDOW CASEMENT FASTENER:** *J. Milne.*—A lever arm or stay has a quadrant slot formed slightly eccentric to the centre upon which it revolves when lowered or raised; through the slot passes the fixing-pin which is fixed to the window-frame; when the window is shut the slot is drawn very tightly into its frame by means of the lever, when it is opened the eccentric again forces it out of its frame; when the lever is raised the slot is continued from the end of the eccentric along the lever arm with small side slots; as the window is opened the lever arm slides along the fixing-pin and may be set at any point by a screw thumb-nut, or more securely by depressing it slightly when one of the side slots comes opposite the pin, which allows the pin to enter the side slot, and then screwing the nut. The contrivance is intended for an outwardly opening casement, but can be adapted to an inwardly opening casement by attaching the lever arm or stay to the frame and the pin to the casement.

23,771.—**IMPROVEMENTS IN WATER-CLOSETS:** *M. J. Adams.*—The closets are made with wings which reach back to the wall in order to close the space behind them, and are used with a siphonic outlet, which gives a low normal level and an extra high water level at the time of flushing; when they are used in multiple form, cisterns are placed near the seat level in such a manner that all can be fed by regulating cistern fitted with a ball valve, the separate cisterns not needing separate ball valves.

[1898] 11,388.—**GUARDS OR FENCES FOR CIRCULAR SAWS:** *R. W. Taylor.*—In order to provide a guard for saws having different diameters, and used interchangeably in one saw bench, is devised an arrangement of levers with two or more metal plates or shields forming segments of a circle corresponding with the diameter of the largest saw, the levers being so disposed and pivoted to a slide working in a fixed head to which the levers are connected that the shields can be closed to guard saws of various diameters by adjusting the slide which moves in a vertical plane and is secured by means of a set screw; the two levers are pivoted to the slide, forming a cross (X), and their upper ends are connected by links to the head of an arm of a pedestal fixed to the bench-table.

14,544.—**CONSTRUCTING CONCRETE FOUNDATIONS FOR WHARVES, DOCKS, EMBANKMENTS, &c.:** AND CONSTRUCTING, LOCATING, AND BONDING BLOCKS IN OTHER STRUCTURES: *B. H. Jones.*—The method consists in moulding the blocks with projecting connecting guides, which extend from end to end of each block, and, as regards those of laterally adjacent blocks, being opposite to and adapted to engage with one another, and to hold the blocks in close connexion for being bonded together; and subsequently in forming the blocks with bonding recesses and with joint-stopping recesses, and the bottom or foundation blocks with spreading recesses, and in bonding all together in a solid mass, and stopping the joints with concrete fillings, both with and without metal tie-rods or bars embedded in the filling.

15,868.—**WATER SUPPLYING AND CONTROLLING APPARATUS FOR WATER-CLOSET TANKS:** *A. Burghin.*—The invention comprises a water-closet tank of ordinary construction having pipe connexion with the bowl, a ducking receptacle for water within the tank and supported by suspension, the valve or cock being adapted, when open, to deliver the water into the receptacle, and valve-operating means so combined with the ducking receptacle that when the latter is empty or less full than a given predetermined extent, the valve will be open for water delivery, and closed automatically after delivery. A sufficient overbalancing quantity of water swings the lever and closes the valve, and a roller weight runs on the lever



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
*Pump Room .....	Harrington Corp. ....	100 L.W. and 200 .....	Jan. 2, 99

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
*Ornate Bell .....	Coventry Corp. ....	J. E. Swindhurst, St Mary's Hall, Coventry .....	Sept. 27
Five Frames, Halsworth Wood-road, Kestley .....	Mr. Lamb .....	W. H. & Son, Archt. Cavendish-st. Kestley .....	do.
Two Cottages, Egle, N.B. Additions, &c. to Farm Buildings. Also a new Moor Refectory, near Arbour, Leighton Garden .....	Leamington Corp. ....	F. G. Candlish, Archt. J. T. Parson, Leamington .....	do.
Amesbury Mills, B.D.C. ....	Pontypool T. D.C. ....	H. M. Haden, Council Office, Remford (Exalt) D.C. ....	do.
Surgeons' Materials .....	Guiney Granite, &c. ....	Guiney Granite, &c. ....	do.
Additions to School House, Wexham T. of W. ....	Newchurch P. B. Ed. ....	E. J. Hargreave, Archt. Ventnor .....	do.
Quarantine Road Metal, &c. ....	Willenden D.C. ....	O. C. Roberts, Public Office, Dryden, Bathurst .....	do.
*Paving Works .....	South Shields T.C. ....	C. E. Burgess, C.E. Chappell, Archt. K. No. 10, Victoria-st. Newcastle .....	Sept. 28
Underground Conduits, Market Place, Making up Goddard-st. and Others .....	Porter Island Union .....	C. W. Bates, Archt. K. No. 10, Victoria-st. Newcastle .....	do.
Dispensary .....	Huddersfield Indus. Soc. Ltd. ....	R. H. Beaumont, Market-st. Huddersfield .....	do.
Ten Houses, Deadwaters, Folly Hall, Bingham R.D.C. ....	Llanelli T.O. ....	G. Watkins, C.E. Town Hall, Barmouth .....	do.
Enlargement Works, near T. Morris, Barmouth, &c. ....	Barmouth L.C. ....	R. H. Beaumont, Market-st. Huddersfield .....	do.
Five Cottages, &c. Spring-st. Barmouth .....	Glendale Union .....	J. Stevenson & Sons, Archt. Barmouth .....	do.
Additions, &c. to Workhouse, Wooler .....	Durham U.D.C. ....	W. T. Jones, Archt. 7 North Bailey, Durham .....	do.
Retaining Wall, &c. South-st. ....	Chester-le-Street R.D.C. ....	G. Symon, Archt. 7 North Bailey, Durham .....	do.
Sewerage Works, Fallow Grange, Harrogate .....	L. & V. Ry Co. ....	Robert & Roberts, Archt. Victoria-st. Leeds .....	do.
Railway Line, White House Junction, York .....	Adm'tn's, Walls, &c. of Bridge, Glazebury .....	Llandoverly R.D.C. ....	Sept. 29
Extension Electric Light Station .....	Hall Corp. ....	A. E. White, City Engineer, Hall Corp. ....	do.
Road Works, Peckham-st. and Others .....	Middleborough Corp. ....	F. Baker, C.E. Municipal Engineer, Middleborough .....	do.
Three Shops and Houses, Cavendish-st. Kestley .....	Flintshire L.C. Ltd. ....	W. J. & B. Bailey, Archt. Flintshire L.C. Ltd. ....	do.
Additions to Workhouse .....	Colchester T.C. ....	H. C. Watkins, Council Engineer, Colchester .....	do.
Town Hall .....	Basingstoke T.C. ....	H. C. Watkins, Council Engineer, Colchester .....	do.
Wood Paving, Market-square .....	Hartlepool Corp. ....	H. C. Watkins, Council Engineer, Colchester .....	do.
Destructive H. use, &c. Clifton-st. ....	Bristol Corp. ....	J. M. C. Wright, Engineer, Clifton-st. Bristol .....	do.
Bridge Superstructure, Redmire .....	Wood Green U.D.C. ....	C. F. Gwynne, Town Hall, Wood Green .....	do.
*Making up Roads .....	Exeter R. J. Bentley .....	O. A. Wilson, Archt. Exeter .....	do.
Alterations to Horse-shoe Inn, Shire-green .....	Truist John's Hospital .....	St. Margaret-st. Canterbury .....	do.
Five Shops and Houses, Northgate-st. Canterbury .....	E. Riding C.C. ....	B. S. Jacobs, Archt. Bowland-st. Canterbury .....	do.
Hospital, &c. Dangerfield-lane .....	Elmbridge Corp. ....	B. S. Jacobs, Archt. Bowland-st. Canterbury .....	do.
Perf. & Auckland, N.B. ....	Wolverhampton Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Extension of County Offices, Beverley .....	Wildes Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Townment, Bank-st. ....	Birmingham Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Street Works, Hilton-st. ....	North Walsham Sch. Bd. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Promenade Extension, West Bank .....	Leicester Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Sewerage Works, New-st. &c. ....	Wigan Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Four Houses, Crawley .....	Burton-on-Trent Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Additions to Schools .....	Northam U.D.C. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
*Twenty-four Cottages, Meanwood-rd. Leeds .....	Dublin Corp. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Additions to Museum Buildings .....	Whitburn (Durham) U.D.C. ....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
*Alms .....	T. Lamb, rt. Town Hall .....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Sewerage, Paving, &c. Eldon and Nelson streets .....	.....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Impounding Reservoir, Melbury Moor, Devon .....	.....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Additions to Fish Market, St. Michael's-st. Dublin .....	.....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.
Slip, Whitburn, &c. ....	.....	J. W. Bradley, C.E. Town Hall, Wolverhampton .....	do.

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Engines Shed, &c. Truro .....	G. W. Ry. Co. ....	G. K. Mills, Paddington Station, Gt. W. ....	Oct. 1
Four Cottages, Solihull Station, near Birmingham .....	do. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
House, (Plant School, Bexley Heath .....	Bexley Sch. Bd. ....	Taylor, 200 & Co. Exeter .....	do.
Cast-iron Main (8 miles) Gt. Bentley .....	Clacton-on-Sea U.D.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Bellor House, &c. Fir Vale-Workhouse .....	Sheffield Union .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Access to Chimney Stack (Erection of) .....	Chelsea Guardians .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Road .....	Lewisham B. of W. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Tramcar Shed, &c. Free School-lane .....	Halifax Corp. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Improvement Works, Gloucester-rd. &c. ....	Litchborough T.D.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Drainage Works .....	Wintour School .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Rowley Granite, &c. (200 tons) .....	Trinity House Corp. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Lighthouse Dwellings .....	Guilford (U.D.) Sch. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Sch. 15, Stoughton .....	Bishopstortford U.D.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Granite Road Metal and Chips .....	Preston (Lane) R.D.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Fewerage Works, Parlington .....	Portsmouth Sch. Bd. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
School, Stanham-road .....	Barking Town U.D.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Eighty-one Cottages .....	Chinnor H.M. Works .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*First Office at Bury .....	W. H. Mansbridge & Co. High-st. Bury .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Additions to Sanatorium, Aspley .....	Hospital Board .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Roads and Footways .....	Merford C.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*New Bridge .....	Greenwich Union .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Workhouse .....	Benbow and Shanks (Leicester) .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Horn Hospitals .....	Southdown U.D.C. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Hall and Buildings .....	Lymer Regis Corp. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Five Cottage Almshouses .....	Bangor Corp. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Buildings, Chimney Shaft, &c. ....	School Governors .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Additions to House, &c. Brynhyfryd .....	Rhymney C.C. School Govrs. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Alterations and Additions to Schools .....	Conduff .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Assembly Hall, &c. at School, Llandaf .....	Parliament at B.W. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Additions to Asylum, nr. Wallingford .....	Parliament at B.W. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Additions to Asylum, Chelney .....	Berkshire Lunatic Asylum .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Water Supply, City of Belm, Para .....	Razailin Consultative .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Supply of 15 ft. x 6 in. Reservoirs .....	Knute View Estate .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
*Supply of 15 ft. x 6 in. Reservoirs .....	Tanbridge Wells Corp. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Road Works, West Clifton Estate .....	C. G. Round Trustees .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Rehabilitating House and Shed, Carret .....	Newlands & Newlands .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Church, Thomas-street, Sheffield .....	Edin. Bros. Archt. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Hotel, Tabby, Dundee .....	Edin. Bros. Archt. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Additions to Kridalens, nr. Cardiff .....	Edin. Bros. Archt. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Shops and Offices, Corporation-street, Lincoln .....	Edin. Bros. Archt. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Warehouses, &c. Corporation-street, Lincoln .....	Edin. Bros. Archt. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Villa, Custer, Aberdeen .....	Edin. Bros. Archt. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Additions, &c. to Steam Laundry .....	Darlington & Sharncliffe .....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Warehouse, &c. Preston-st. Bradford .....	Industrial Aid Soc. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Business Premises, Sherrington .....	Sherrington Co. op Soc. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Additions to Business Premises, Sherrington .....	Sherrington Co. op Soc. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Club Tower and Suite, Bournemouth .....	Sherrington Co. op Soc. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
Six Houses, Brighton .....	Sherrington Co. op Soc. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.
House, 1 Key .....	Sherrington Co. op Soc. ....	W. J. Weaving, 199 Broad-way, Bristol .....	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Rev. Exr.'s General Assistant .....	Plymouth Corp. ....	100/- rising to 120/- per ann. ....	Oct. 1
*Foreman for Street Gas Lighting .....	do. ....	15/- 6d. per week .....	do.
*Measuring Clerk in Architects' Department .....	London C.C. ....	120/- rising to 150/- &c. ....	Oct. 5
*Assistant Organizer of Manual Training .....	School Board for London .....	Min. 120/- Max. 170/- ....	Oct. 8

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, viii, & xxi. Public Appointments, pp. xix, & xxi.

from which it suspended a receptacle which contains the water for discharge.

16,284.—DEVICES FOR APPLYING METALLIC LEAF FOR DECORATIVE PURPOSES: H. F. Cox.—The invention is intended to furnish means for depositing the leaf from a spirally-wound package-roll upon the depressions of a grooved or corrugated surface, and consists of the combination of a brush with a frame for holding the package-roll in operation, the paper slip and its accompanying metallic leaf are brought forward from the package roll and passed underneath the brush, then, by placing his finger upon the strip near the brush's point, and drawing the brush back, the operator effects the laying of the leaf upon the grooved surface, the brush's elastic point serving to depress the leaf and strip downwards; the contrivance is also adapted for applying the leaf to mouldings, by forming the brush's face to correspond with the sections of the mouldings.

## NEW APPLICATIONS.

18,288, M. J. Adams, Moulds and Machinery for making Sanitary Fire Traps, and similar articles. 18,289, D. Campbell, Hot Air and Vapour Bath Cabinets. 18,291, J. T. Cope, Ventilating Apparatus. 18,293, Ritchie & Sutherland, Valves for Baths, Basins, &c. 18,294, R. F. Hall, 18,295, H. O. Svoboda, and 18,296, H. V. James, Electrical Arc Lamps. 18,297, J. Hanschildt, Apparatus for Watering the Streets. 18,297, W. Blankenhorn, Electrical Switch Device. 18,298, J. Onions, Edge-Runner Grinding Mill for Powdering Marls, Bones, Cement, Slags, &c. 18,299, A. Jourdan, Copying, Enlarging, or Reducing Drawings and Designs. 18,300, J. Perl, Platinum Gas Lighting Pellets. 18,301, J. V. Esop, Anti-Corrosive Garments. 18,302, A. Allen, Roofing. 18,303, R. Söderquist, 18,304, Hansen & Krafning, 19,149, J. S. Goodwin, and 19,280, W. F. Gedge, Acetylene Gas Generators. 18,944, H. Borchardt, Automatic Gas Igniter. 18,953, J. J. Jankowski & Newiarowski, Fire-proof Protecting Compositions and Fire-proof Articles. 18,955, J. W. Thomas, Chimney Pots, &c. 18,959, E. I. Bradet, Composite Pipes. 18,971, P. J. Steinke, Weighing Machines. 18,978, J. Whiteley, Guards for Circular Saws, &c. 18,988, W. Dunn, Chimney Pot Cylinders. 18,990, A. J. B. Ward, Self-Locking Flooring Tiles, &c. 18,992, J. Trimming, Drains. 19,025, M. J. Adams, Distributing Apparatus for Sewage Tanks and other Purposes. 19,044, D. Campbell, Gas or Oil Heater for Use in Hot-air and Vapour Bath Cabinets, and for







**NEW BROMPTON** (Kent).—For additions, &c., to chapel, Canterbury-street, for the Wesleyan Trustees. Messrs. J. W. Nash & Son, architects, High-street, Rochester.—  
 H. Wyles ..... £1,500  
 G. E. Woodard ..... 650  
 T. Cornhill ..... 500  
 \* Accepted.

**NEWMARKET**.—For the erection of a house, Bury-road, Newmarket. Messrs. H. K. Bevington, architect, 10, Friar-lane, Leicester. Quantities by the architect.—  
 A. Coe ..... £1,000  
 H. Holland ..... £1,800  
 Shilline & Son ..... 1,500  
 H. Wilmet ..... 1,500  
 H. J. Linsell ..... 1,800  
 \* Accepted.

**NEWMARKET**.—For the erection of house at Newmarket. Messrs. Hutton & Gibb, architects, Newmarket. Quantities by Stoner & Sons, 8, Blomfield-street, E.C. 4.—  
 H. Plummer ..... £2,700  
 H. J. Linsell ..... 1,400  
 \* Accepted at £2,000 reduced.  
 [Architect's estimate, £2,090.]

**PUDSEY** (Yorks).—Accepted for the construction of filtration tank, Farnworth Mill. Messrs. Nelson & Savage, architects, 15, Park-row, Leeds.—  
 Thomas Wood, Red-Hill-lane, Pudsey ..... £156  
 [Eight tenders received.]

**RAMSGATE**.—For the erection of offices for the Corporation. Mr. W. A. Mcintosh Vallin, engineer, Ramsgate.—

E. Padgett & Sons	£5,100 13 0	.....	135
J. M. Farnham & Sons	4,250 0 0	.....	135
C. Home	4,000 0 0	.....	135
Hayward & Farnham	3,000 0 0	.....	135
Jarman & Sons, Ramsgate	3,000 0 0	.....	135

\* Accepted.

**READING**.—Three houses in Berkeley avenue East for Mr. J. High Monck. Messrs. Cooper & Howes, architects.—  
 The Three Houses.  
 Higgin & Son ..... 110 0 0  
 C. S. Lewis & Bros ..... 1 30 0  
 Collier & Cullay ..... 1 30 0  
 J. Buttrill & Son ..... 1 30 0  
 \* Accepted.

**ROMFORD**.—For the erection of a cottage, stable, &c., at Town Yard, Market-place, for the Urban District Council. Mr. J. Turvey, Surveyor, Market-place, Romford.—  
 T. Burt ..... £600 7 6  
 J. Newlin ..... 500 0 0  
 \* Accepted.

**RUABON**.—For the erection of a Wesleyan Chapel, Glyn Ceir & R. T. Jones, architect, 1, Cambrian terrace, Llan-glyn.—  
 R. Williams ..... £1,000  
 Jones & Evans ..... 300 0 0  
 Richard Jones ..... 200 0 0  
 The trustees supplied all building stones, roofing slates, and crest; lime in sand and concrete, and heads, joints, panths, and steps.

**SENGHENYDD** (Wales).—For the erection of a chapel, for the Calvinistic Methodists.—  
 J. Howells ..... £1,800  
 D. Evans ..... 1,700  
 T. Roster ..... 1,700  
 J. Lewis ..... 1,600  
 \* Accepted.

**SOUTHEND**.—Accepted for the execution of street works, Haddigh-road, &c., for the Corporation. Mr. A. Fisher, C.E., Clarendon-road, Southend.—

W. Iles, Sutton-road	£145
W. Iles, Sutton-road	£376
W. Iles, Sutton-road	£571
W. Iles, Sutton-road	£408

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT  
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 59, EAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.  
 Telephone, No. 574 Holborn. Tele. address: "SNEWIN, London."

**WALTHAMSTOW**.—For alterations and additions to the "Rose and Crown," Huse-street, North Walthamstow, for Mr. John Payne. Mr. Theo. Keating, architect and surveyor, Walthamstow.—  
 A. J. Rees ..... £1,875  
 T. Fuller & Son ..... 1,700  
 [Architect's estimate, £1,500.]

**WOOLWICH**.—For the removal of eleven water-closet apparatus, with cisterns, and other plumbing work, at the workhouse, for the Guardians of the Woolwich Union. All goods specified to be Henry D. Hill & Co. s.—  
 Greenaway ..... £350 13 0  
 Mills ..... 100 0 0  
 Cowley ..... 100 0 0  
 Richardson ..... 100 0 0  
 \* Accepted.

With reference to the erection of factory premises at Chislehurst, the results of tenders, for which appeared in our last issue, Mr. J. Rookwood asks us to state that he is not the architect of the building, but the quantity surveyor; the mistake was not ours.

## TO CORRESPONDENTS.

J. L. (London) should have been stated.  
 NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
 We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.  
 We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 12s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 20s. per annum. Remittances (payable to DOUGLAS FOURDRINER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS (by prepaying at the Publishing Office, 12s. per annum or 4s. 6d. per quarter), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

## HIGH-CLASS JOINERY, LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

## CONSERVATORIES,

## GREENHOUSES,

## WOODEN BUILDINGS,

## Bank, Office, & Shop Fittings.

## CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## TRE BATH STONE FIRMS, Ltd.

BATH.  
 FOR ALL THE PROVED KINDS OF  
**BATH STONE.**

FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

## HAM HILL STONE DOULTING STONE.

The Ham Hill and Douling Stone Co. (Incorporating The Ham Hill Stone Co. and C. Trank & Son The Douling Stone Co.).

Chief Office:—Morton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [Advtr.]

## SPRAGUE & Co., Ltd., LITHOGRAPHERS AND PRINTERS.

Estate Plans and Particulars of Sale promptly executed.

4 & 5, East Harding-st., Fetter-lane, E.C. [Advtr.]

## QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

**METCHIM & SON**, 10, GORBOURNE WESTMINSTER "QUANTITY SURVEYORS' DIARY AND TABLES." For 1898, price 6d. post 7d. In leather 1/- Post 1/11 ADVTR.

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

SLATES, SLABWORK, Enamelled Slate, Marble, Permanent Green Slates.

WORKS:  
 Bow, London, E. and Aberllefenny, North Wales.

BRANCH HOUSE:  
 37, Victoria-street, Bristol.

## PILKINGTON & CO

(ESTABLISHED 1838), MONUMENT CHAMBERS, KING WILLIAM STREET, LONDON, E.C.  
 Telephone No., 2751 Avenue

## Polonceau Asphalte.

PATENT ASPHALTE and FELT ROOFING. ACID-RESISTING ASPHALTE. WHITE SILICA PAVING. SEYSSSEL ASPHALTE.

# BRICKMASTERS' EMPLOYERS' LIABILITY ASSOCIATION, LIMITED.

## DIRECTORS.

CHARLES CREMER, Esq., Faversham, Kent, Brick Manufacturer.  
 R. L. CURTIS, Esq., 120, London-wall, E.C., Brick Manufacturer.  
 GEO. H. DEAN, Esq., J.F. of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.  
 E. W. GOODENOUGH, Esq., 37, Walbrook, E.C., Brick Manufacturer.  
 A. J. KNIGHT, Esq., Rainham, Kent, Brick Manufacturer.  
 H. Y. PACKHAM, Esq., of Willis & Packham, Limited, Sittingbourne, Brick Manufacturers.  
 A. RUTTER, Esq., of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
 J. WILLSON, Esq., J.P. of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
 GEO. E. WRAGGE, Esq., of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—E. J. COLEBY, Esq., 148, Gresham House, Old Broad-street, E.C.



# The Builder.

VOL. LXXV, No. 266.

OCTOBER 1, 1896.

## ILLUSTRATIONS.

The Abbeys of Great Britain.—XXVII. Lanercost Priory. Drawn by Mr. E. Ridsdale Tate	Double-Page Ink-Photo.
Ground Plan, Lanercost Priory	Double-Page Photo-Litho.
Stalls in Chapel, King's College, Old Aberdeen. Measured and Drawn by Mr. Jas. B. Fulton	One Double and One Single-Page Ink-Photo.
Old Oak Stalls in Dunblane Cathedral. Measured and Drawn by Mr. Jas. B. Fulton	Single-Page Ink-Photo.

## Blocks in Text.

Sketches of London Street Architecture.—No. XXIX. Office Front, No. 6, Great George-street, S.W.	Page 287
Bishop Blacader's Crypt, Glasgow Cathedral	288

New Doors to Choir Vestry, Tadcaster Church. Messrs. Bromet & Thorman, Architects	Page 287
---	----------

## CONTENTS.

The Craze of Mysticism	284	New Choir Doors, Tadcaster Church	287	General Building News	296
The West Electric Candle	285	The Sanitary Institute Congress, Birmingham	288	Sanitary and Engineering News	298
Notes	285	Lanercost Priory	289	Stained Glass and Decoration	298
Ecclesiastical and Educational Art Exhibition at Bradford	284	Stalls: Aberdeen and Dunblane	292	Foreign	298
Office Front, No. 6, Great George-street	286	St Saviour's, Southwark	295	Miscellaneous	298
Modern Sanitation	285	Newark Priory	295	Legal	299
The Architectural Association	287	Architectural Lectures at University College	295	Meetings	299
Architectural Societies	287	The Students' Column: Sound, Light, and Heat—XIV.	295	Recent Patents	299
Bishop Blacader's Crypt, Glasgow Cathedral	288	Books Received	296	Some Recent Sales of Property	304

### The Craze of Mysticism.



SOME few years ago we reviewed, not without sympathy and interest, Mr. Lethaby's curious and suggestive volume on "Architecture, Mysticism and Myth." We concurred

with him in the general belief that in the most ancient times of which any of the architectural monuments remain to us, there was an idea in the minds of their builders of planning and fashioning them—temples especially, which in ancient times were almost the only buildings of architectural importance—in accordance with some agreement with cosmical measurement and proportion as far as they knew it, or in accordance with a system of symbolism based on their notion of the order of the universe, or on a system of geometrical proportion which was regarded as symbolic. Mr. Lethaby, fortunately for himself and his book, did not attempt to go much into detail; he said he had not the necessary learning. He and his book were probably better without it; by keeping to generalities and to the poetic side of his subject he escaped pitfalls, and succeeded in suggesting many ideas in regard to abstract architecture which were exceedingly interesting, and were calculated to stimulate the architectural fancy and quicken the architectural imagination, even if they could not be turned to much practical use in every-day practice.

In the present day, when there is so much questioning and theorising as to what architecture might be or ought to be, it is not surprising that some persons should be tempted to take refuge in the contemplation of an imaginary perfection of architecture in accordance with some theory or rule which was once known and is now forgotten. And when people once begin to give themselves up to working out possible theories of this kind, it is not long before they are tempted to ride them to death; to see everything from the point of view they have adopted. Even a scientific man like Sir Norman Lockyer has not been proof against the snare. He took up the idea that the Egyptian temples were orientated to-

wards particular stars or towards the sunrise on a certain day of the year, and allowed himself to be carried so far as to regard them as little more than so many telescopes or astronomical instruments, forgetting that all the architectural detail, the modelling, placing, and decorating of the columns, was entirely beside such a purpose, and must have had its own purely artistic end. And when persons of less scientific intellect begin to regard architecture entirely from the symbolic point of view, and to endeavour to reason out the bases of the symbolism in the architecture of the past ages, they are liable quickly to come to a pass which reminds one of Lear's exclamation—"Oh! that way madness lies." Such a readable and comparatively reasonable book as Mr. Lethaby's, above referred to, was not unlikely to be followed by others of a less sane description, such as the one which has recently been put forth, by an author who (wisely) remains anonymous, under the title "The Canon."<sup>\*</sup> The title, which seems rather a puzzle at first sight, is intended to convey that there is existing a general rule by which all works of art, and architecture more especially, can be alone perfectly carried out. The result is the most extraordinary medley of absurdities that we have come across for a long time; but it serves as a warning of what writers are led into when they once give themselves up to this kind of mysticism.

The book is prefaced by an introduction by Mr. Cunningham Graham, who is kind enough to inform us that "Music and literature, with painting, surgery, and economics, with boxing, fencing, and others of the liberal arts (!), all have a style fit and peculiar to the times, but architecture yet remains a blot and disgrace to those who live by it, and to all those who use the edifices which it makes, or pay the makers' bills." What are the pretensions of Mr. Cunningham Graham to sit in judgment on all modern architecture we have yet to learn. The superiority of ancient architecture is proved, to Mr. Graham's satisfaction, by a quotation from a book by Antonio Llobera, printed at Figueras by Ignacio Porter in 1758, under the title "El Porqué

<sup>\*</sup> "The Canon: an Exposition of the Pagan Mystery Perpetuated in the Cabala, as the Rule of all the Arts. London; Elkin Mathews; 1897.

de Todas las Ceremonias," which informs us that "all temples and churches are symbols or figures of the human body. . . the high altar is the head, the transepts are the arms, and the rest of the temple . . . is the body," "so that he knew apparently that churches were built according to a canon, and had assumed the form in which we know them for a special reason." It is quite possible, and perhaps probable, that in the mediæval period such fancies were attached to the form of the ground plan of the church, and that the obliquity of the choir or eastern arm, in a good many churches, was a symbolism of the inclination of the head of Christ on the Cross; though even this is open to question, and some have been more inclined to explain it as an effort after a certain effect of perspective. But it is quite certain that the first Christian churches were not planned with that idea, because their plans will not work into it, and that the Latin cross form did not really develop from such an idea; it was symbolism tacked on afterwards, if it was there at all; and no man with a logical mind, who had studied conscientiously the development of church planning from the early Christian to the mediæval period, could imagine otherwise. And supposing that the mediæval church were planned with that symbolic idea, what the better is the architecture for that—what has that to do with art, except for the minds of children? Mr. Graham goes on to assure us that "the author of the present work argues out his case with much precision and a wealth of figures, proving most clearly that the external measurements of almost every ancient temple, the figures of the New Jerusalem, Holy Oblation" (what is the "Holy Oblation"? "and other temples, real or imaginary, reveal the magnitudes of the sun moon, and other planets, together with distance of their orbits." As these were not correctly known until modern times, and as the earth was then supposed to be the centre of the cosmic system, the indications must in that case have been all wrong in relation to cosmical measurement; and if the beauty of architecture consists in its true relation to cosmical geometry, it is evident that in that case the ancient architecture was no better than the modern, which neglects cosmical geometry. But supposing it different—supposing that the builders of Greek or Egyptian temples knew

as much about the measurements and distances of the heavenly bodies, and the measurement of the earth, as we know, what has that to do with the artistic effect and expression of a building? Geometric proportion in the parts of the building itself may have something to do with it, no doubt; but a building might represent correctly, in its various parts, certain proportions of cosmical scale—the relative orbits of the planets or their relative distance from the sun for instance; but what the better architecture is it for that? Or what the better are the details? Will cosmical geometry design a Corinthian capital?

As to the treatise which follows, such a medley of absurdity and childishness, to the extent of nearly four hundred pages, has certainly rarely been given to the world in modern days. It is as if all the foolish beliefs and fancies—"oppositions of science falsely so called"—which satisfied men in former days, were shovelled together and offered to us in a heap, as a solution of every artistic question. There is no order or logic in the composition; in many pages it is impossible to find out what the author is driving at. He tells us in the commencement of his introduction that "the failure of all efforts in modern times to discover what constituted the ancient canon of the arts, has made this question one of the most hopeless puzzles which antiquity presents." We may suggest the possibility that after all there was no such "canon," but we fear the author would regard that as rank blasphemy. Whatever be the puzzle, he has not succeeded in unravelling it. As far as he has any system at all it appears to consist in this: "the Greek and Hebrew letters had each a numerical value, so that every word in these languages may be resolved into a number by adding together the value of each letter of which it is composed." Accordingly we are to regard all ancient names as concocted to represent certain numbers, which numbers signify certain cosmical measures; the word *χριστός* is equivalent to 1,480, which "as will be shown further on, accurately exhibits an important measure of the cosmos." What this has to do with architecture or design is not apparent at first, and in fact it is only here and there that we get any indication of it. *Ex gr.:*—

"According to Vitruvius a man's height is four cubits=6 ft.=24 palms=96 digits. Now taking the earth's distance from the sun at 10, the radius of the sphere of the zodiac becomes about 96, so that the number of digits in a man's height may have been supposed to measure the seven orbits of the planets, surrounded by the fixed stars. In that case, when Vitruvius lays it down that all temples are to be designed according to the proportions of the human body, he may mean that the temples were to conform to the measures of the universe."

"May mean" is delightful. There are better things than that in the book, and it is only justice to the author to say that he is less hesitating in many of his statements. Vitruvius, we may observe, is assumed to be an essentially mystical writer, with meanings which do not appear on the surface. The names and proportions connected with the Orders, we are told, "have evidently been assigned with a mystical purpose, as an analysis of their numbers will show. The Doric was the oldest column, and was first made in the proportion of six to one, in imitation of the body of a man, as it is said, whose foot was found to be the sixth part of his height." The author unfortunately

seems rather out about the proportions of the Doric column; the Parthenon column is five and a half diameters; older examples, such as the large temple at Paestum, are four and a half diameters. The Doric column, it appears, represented the Macrocosm; a little further on we are told that, being six to one (the author is determined to stick to that), it was the ratio of Noah's ark. Also the Greek words *Κίον Δωρικός* (Doric column) are equivalent to the number 2,084, "the side of the Holy Oblation." But there is yet more to be got out of the Doric column.

"The name *Δωρος* yields 1,174, and this is the length of a rhombus whose width is 677, which is one more than the square of twenty-six, and one less than the length of the sun's orbit."

The sun's orbit is, we believe, stated in multiples of the earth's distance—when that happens to fit in with the figures wanted. The author has not been able, however, quite to hit it off here, as he has to be content with "one more" and "one less"; but that does not trouble him; he is quite sure of his conclusion from these figures, as follows:—

"The Doric column, therefore, may be said to be the symbol of the generative power of the universe, expressed by the sun, which of all the celestial bodies most conspicuously appears to measure the whole extent of the cosmic system."

And this is to lead us to the canons of art! There is plenty more in the book as amusing as this; but probably the reader has had enough. The book could hardly have been thought worth serious notice at all, but for the fact that it is almost too good a joke to be lost, and that it really does afford a useful kind of warning as to the sort of rubbish people may expect if they once lend an ear to architectural mystics.

#### THE NERNST ELECTRIC CANDLE.

ABOUT a year ago Dr. Walter Nernst, Professor of Physics in Göttingen University, and well known as the joint editor of the *Zeitschrift für Elektrochemie*, patented an electrolytic glow lamp which has excited a great deal of interest in electrical circles. He uses a strip of refractory material which, when heated by an electrical current, glows in the open air and produces a steady white light most suitable for illuminating purposes. His early experiments showed that its efficiency was much higher than that of the vacuum bulb glow lamp, the current required being only about a third of that taken by an ordinary lamp of the same candle power. Many subsequent experiments have verified Dr. Nernst's results, and the only point about which there is room for doubt is as to how long the wick will last before it needs replacing. To some it may seem a retrograde step to go back to an electric candle, and older electricians will remember that Jablockhoff candles required constant trimming, and that the carbons were rapidly consumed. The life of the strip of refractory material Dr. Nernst uses is, however, not to be measured by minutes, but by hundreds of hours, and it now seems probable that, in length of life, it may rival the incandescent lamp.

In the ordinary glow-lamp we have a carbon filament placed in an almost perfect vacuum, enclosed by a glass bulb. In the Nernst lamp there is simply a filament of badly-conducting material, like magnesia, stretched between the two terminals. In the

earliest and simplest form of the lamp, when the current was switched on, very little passed, owing to the high resistance of the strip of magnesia at ordinary temperatures. If it were now heated by means of a match, or even by touching the strip with the glowing end of a cigarette, then its resistance fell, and the heating effect of the larger current was sufficient by itself to keep it incandescent. Measurements of the current taken showed that it was only between a third and a quarter of that taken by a vacuum bulb lamp of equal candle power.

The great drawback to the earlier lamps was the necessity of using a match in order to light them, but in several of the later modifications of his lamp Dr. Nernst gets over this difficulty in various ingenious ways. In one lamp he wraps round the strip of refractory material a fine platinum wire enclosed in a transparent insulating material. On closing the switch the electric current passes through this wire, heating it and thus causing the filament to light; and then a further motion of the switch cuts the platinum wire out of the circuit. In another lamp a small concave reflector is used to focus the heat from a small resistance coil on to the filament and so cause it to light; but in this lamp also the current has to be switched off the resistance coil by hand. In his latest form this is done automatically. When the lamp lights the current that then flows magnetises a solenoid which sucks up an iron bar and by this means breaks the circuit of the auxiliary heating coil.

It will be seen that the principle of Dr. Nernst's invention is simply to use as filaments for his lamps strips of those badly-conducting materials which become good conductors at high temperatures, such as magnesia, zirconia, lime, and the oxides of several metals. A good illustration of how this class of substances behave electrically is shown by a piece of glass rod. If we place this rod between the terminals of a Wimshurst machine, and then turn the handle, sparks will take place in exactly the same way as if there were no glass rod. On heating the rod with a Bunsen burner until it is red hot, then we can get no sparks at all from the machine, the electrical discharge passing quietly along the glass rod which is now a conductor. As the glass cools the discharge produces a beautiful glow in the rod very conspicuous in a darkened room, then occasional sparks ensue and finally the glass becomes a non-conductor again, at a temperature however considerably above the temperature of the room. Glass thus acts electrically in a totally different manner to metals, its resistance diminishing as its temperature increases. It acts in the same way as all bodies in which the passage of electricity is accompanied by chemical decomposition. These bodies are called in technical language electrolytes, and we can have solid electrolytes like glass as well as liquid electrolytes like the solutions that are used for electroplating or the liquids in a Daniell's cell.

Many electricians were of opinion that the Nernst Candle could only be used in alternating current circuits as the filament being electrolytic must be disintegrated sooner or later by direct current. Professor Nernst, however, in a recent letter to the *Electrotechnische Zeitschrift*, says that the latest form of filament he uses is equally applicable to either direct or alternating current.



In his English patent he claims to have invented a combination of a heating device with a material which is non-conducting when cold and conducting when at a high temperature, but he does not describe any method of preventing the disintegration of the electrolyte.

Professor Nernst and the *Allgemeine Elektrizitäts Gesellschaft* are still making improvements on the lamp, and we are informed that it will be shortly placed on the market. As these lamps can be directly used in any installation (100—220 volts alternating or continuous), there is no need for altering or modifying the ordinary wiring of buildings, and consumers, therefore, need not be afraid that their present installations will soon become antiquated.

If it were possible to purchase Nernst lamps equal in efficiency to those we have seen, and if their life can be guaranteed for a few hundred hours, then there is no doubt that this method of lighting will become very popular. We fancy that there would be a fair demand even for the older forms of Nernst lamp, which require to be lighted by a match, as the meter bill would be reduced by their use to one-third its present amount. The cost of the materials used in making this lamp would be less than that of the materials used in an ordinary vacuum bulb lamp, and, apparently, they would be very easy to make. The replacing of the wick when worn out could be done as easily as changing a glow-lamp, and, unlike the glow-lamp, the only waste product would be the burnt out filament. In our opinion, if Dr. Nernst's invention survives the life test successfully, as we have reason to believe that it will, then it will prove a very formidable rival indeed to the glow-lamp.

#### NOTES.

**Birmingham Water Famine.** The water supply question in Birmingham has assumed a serious phase. If the city has to depend on the quantity of water now stored the supply can only last a few days longer. The Authorities have appealed to the public to curtail their consumption as much as possible, and the quantity saved by this and the water served to the largest reservoir by the river Bourne, now little more than a trickling ditch, may have the effect of prolonging the duration of the supply for a few weeks. It is recognised, however, that even if the immediate danger can be satisfactorily averted, an early winter with severe frost would bring about most serious consequences. The city is, of course, very anxious to get its new supply from Wales, when this state of things cannot possibly recur, but in the meantime something must be done to remedy matters. The immense reservoir at Shustoke is nearly 9 ft. below its proper level, and that at Whitacre is absolutely empty. It is difficult to suggest any means of augmenting the supply at once; well-sinking, with all its uncertainties, is the first thing to present itself, but we fear there is little hope of much water for so large a city being obtained by that means in the neighbourhood. At the present moment 27 gallons per head per day are being served out, and that is above the average of last year's summer supply. The only thing to be done, apparently, is to reduce the quantity supplied, and wait for the rain.

#### The Strike in Paris.

At Paris there is a strike among the excavators, well-sinkers, and tunnel excavators, the "Démolisseurs" having also joined in through sympathy. At this season it does not so much affect the building trade as the engineering work in hand for the Metropolitan Railway and the Exhibition. The strikers demand a pay of 60 centimes per hour—the official Price-book price—instead of that of 45 centimes now paid; and the suppression of the *signature* by which each labourer binds himself to work for the same pay, under all conditions, be it simple work, work in water or in mud, or dangerous well-sinking or tunnelling. The contractors are endeavouring to compromise, but the strikers hold out. The tunnel-excavators demand also an allowance for lamp-oil, which now costs each man 25 centimes (2½d.) a day. If the strikers obtain their demands, it is expected that the whole of the building trades will probably come out on strike successively.

#### The Clock Face, St. Paul's.

THREE years ago, in our issue of October 5, 1895, we called attention to the bad effect of the glazed clock face in the southern tower of St. Paul's, which filled up the opening with a kind of blank eye, contrasting painfully with the shadow in the corresponding face of the northern tower; while the dial thus treated must have been useless for illumination at night, as the figures were placed on the circular architrave round the opening, so that the hands only, and not the whole even of the minute-hand, could have been seen against the illuminated dial. The objections to the dial as thus treated seem to have been at last realised, as we learn that the dial is being removed and skeleton iron centres put in; the work being done by Messrs. Smith & Son of Derby, the makers of the clock. It appears that the illuminating lights had never been fixed behind the dial after all, so that it only spoiled the look of the tower by day and was of no use at night. The change is no doubt due to the influence of Mr. Somers Clarke, the present Surveyor to the Dean and Chapter.

#### Croydon Water Supply.

THE public inquiry into the proposal of the Croydon Corporation to utilise water at Waddon having led to a refusal to sanction the scheme, the Corporation are at their wit's end to know what to do next. In the meantime, the inhabitants, who have been under a very short and inadequate supply for some months—long before any question of serious drought could be entertained—are crying out loudly. The streets are not watered, the dust is abominable, the dustbins are not emptied frequently enough, and the death-rate has been slightly augmented, though the general health of the borough is yet good. We are not surprised that the Waddon source has been refused; the danger of contamination was too great, and any one with a knowledge of the official manner in dealing with water-supply questions could foresee what would happen. Meantime, the Corporation must do something—there is plenty of water to the southward—and the present state of things cannot long continue.

**Artesian Wells in Paris.** The engineers of the Municipal Service of Paris have just completed the piercing of the artesian wells at Butte-aux-Cailles (XIIIth

arrondissement), commenced in 1864 by MM. Dru, and now terminated by M. Cerrault, who took charge of the work since 1872, and encountered unexpected difficulties which have delayed its completion till now. It is proposed to erect a large baths establishment at this point, and to lay out a square there. This is the fifth of the artesian wells sunk in Paris, all of which give a full flow of water.

**Lincoln's Inn Fields Public Garden.** OUR readers will recall that the London County Council have lately testified to their desire to share, so far as may be, with those who seek to place on record the memories that attach to certain buildings and sites in London distinguished for their architectural, historical, and kindred interest. Their first step in that direction is somewhat unlucky. In the floor of the central pavilion in Lincoln's Inn Fields garden, of which the Council are now the custodians, has been inserted a small plate thus inscribed:—

On this spot was beheaded  
LORD WILLIAM RUSSELL,  
A lover of constitutional liberty,  
21st July, A.D. 1683.

With the political events of the time we, of course, are not concerned, nor with the Council's opinions in that respect. But we may point out that they have fallen into a common error by describing William, Lord [Baron] Russell, as "Lord William Russell," a style he never bore. As the eldest surviving son of William, fifth Earl of Bedford, he had succeeded to the second title of his house: his father was advanced Marquis of Tavistock and Duke of Bedford, on May 11, 1694, eleven years after his son's death on the scaffold.

**The Discobolus Statue.** UNEXPECTED light has been thrown on this statue, or rather series of statues, for there are several replicas of the same type in the British Museum, the Louvre, Vatican, and at Duncombe Park. The type in question is not the familiar one in which the actual moment of hurling the discus is represented, but the type, perhaps scarcely less familiar, in which the attitude is still erect, and the athlete advances with the right foot preparatory to the throw. The difficulty has always been felt—why is the athlete advancing the right foot, when the natural pose is with the left foot advanced? And as the Greek sculptor was no careless observer of the actualities of the gymnasium, the difficulty was a serious one. Dr. Trendelenberg, in the last issue of the *Jahrbuch* (xiii., 1898, heft 2, p. 127) solves the problem. The supposed athlete is no human athlete at all, but the god Hermes, patron of athletes, and he is not preparing to hurl the discus, but simply holding it in a characteristic attitude. This theory is placed almost beyond question by comparison of the statue with a coin of Amastris of Paphlagonia, where the god is represented exactly in the same pose as in the statue, and with a caduceus in the raised right hand. Dr. Trendelenberg proposes to restore the statue holding the caduceus.

**Taunton Castle.** WE understand that the Somersetshire Archaeological and Natural History Society propose to celebrate this, being their fiftieth, year by converting the great hall of the castle for purposes of their museum. The castle has formed the Society's headquarters



since its purchase by them in 1875. The castle was originally erected by Ina, who was King of Wessex in 688-728, and consisted for the most part of earthworks, whereof portions yet exist, together with some part of the structure built by Bishop Gifford (of Winchester) during Henry I.'s reign. Other additions were made in the fourteenth century, also by Bishop Langton in 1490, and by Bishop Horne ninety years later. Horne's great hall, repaired and altered in 1785, is the place wherein Judge Jeffreys held his "Bloody Assize," after the Duke of Monmouth's defeat at Sedgemoor. The castle and town had been held for a while by Perkin Warbeck, and in 1645 sustained, under Blake, a memorable siege against the Royalist troops commanded by Lord Goring until relieved by Fairfax. The Society's collections include six volumes of sketches, made in India ink, by J. and J. G. Buckler, father and son, of architectural remains in the county as they existed in the early years of the current century. Two views, by Mr. Roland W. Paul, of the castle courtyard and Langton's entrance gateway will be found in our number of August 20, 1892. Ethelheard, Ina's successor, gave Taunton to the bishops of Winchester.

A New Silver  
Exhibit, South  
Kensington.

THE collection of silversmiths' work lent by Colonel Walsdo-Sibthorp to the South Kensington Museum, and which is to be found in a case on the left of the gangway in the second court of the Museum, contains some work of considerable artistic interest. The collection of English spoons includes a beautiful and unusual "Apostle" set, in which the figures are framed in little shrines at the top of the handles, each surmounted by a cock, and the junction of the spoon with the bowl is decorated by a cherubic head with crossed wings. Near these are a fine set of silver-gilt tea-spoons presented to Nelson, to which a marine character is imparted by the shell forms of the bowls and the dolphins twining up the handles. The plain or nearly plain English spoons of different dates are interesting from the degree of character imparted to them by the mere shape of the bowl and handle; in the majority of instances it is noticeable that, in opposition to the modern practice by which the bowl of a spoon is wide next the handle and rounds to nearly a point at the end, the bowl is narrow next the handle and spreads out to a wide rounded curve at the extremity. There is more of structural propriety of design in this than in the modern treatment; whether it is so convenient or so graceful for use may be questioned. A Scandinavian spoon in which the upper part of the handle is formed by a broad open trellis, and the handle is decorated by loose rings at the side, has a great deal of character. On the other side of the case a spoon marked "St. Andrew" shows how a good effect may be got by slightly modelling the surface of the bowl in radiating lines. Among the larger objects are some fine German cups and tankards, and one very bad one taking the shape of a spurred boot executed in silver, the leg forming the cup portion; about as tasteless a design as could be seen; but it may be useful as a warning. The cup and cover surmounted by the head of Gustavus Adolphus, which has attracted some attention, is not in reality a very good

piece of work; it is feeble and pretentious in design. Among the curiosities of the collection are some salt-cellars accompanied or supported by little figures of men engaged in various occupations of which the bowl seems to form the object; and some small handbells in the shape of highly-dressed dames whose spreading skirts, chased with minute surface ornament, form the bell; two of these figures carry small bowls in their upraised arms which form the handle of the bell. For a small collection, there is a good deal that is interesting in this case of old silversmiths' work.

The Clairon  
Monument.

In our issue of July 16 we gave an illustration of this fine piece of decorative monumental work, by M. Gauquié as sculptor and M. Guillaume as architect, and mentioned that it was to be erected at Condé-sur-Escaut, the birthplace of the celebrated actress. It appears, however, that the proud hamlet of Condé-sur-Escaut resents being connected with the memory of a mere actress, and has refused to permit the erection of the monument. Accordingly, it is to decorate some public place in Paris, not yet determined on. The rather stupid action of the Condé-sur-Escaut authorities (very unusual in France) will be a gain to Paris, as the monument is a really admirable work.

The  
Photographic  
Salon.

THE sixth exhibition of the Photographic Salon, now open at the Dudley Gallery, certainly shows a definite progress in the direction of making photography "expressive of personal artistic feeling and execution," which is the professed object of the Salon, though in some cases it is rather difficult to feel sure how far the result obtained can properly be defined as photography; some of the exhibits give the idea of being very much worked up by hand. There are landscapes, however, in which a very pictorial effect is obtained apparently by no means but focussing and choice of position and light; Mr. Hinton's "Suffolk Meadows" for instance (85), and Mr. Aston's "The Farmstead" (196). In other cases the photograph fails to answer to the title of the landscape; "Early Morning, Concarneau" (129), is no doubt a pretty miniature view, but where is the "early morning" effect? It might be any time of day. In "Sunshine and Showers" (201) Mr. H. P. Robinson has secured a fine effect of sky, but the sea looks rather hard. "An Atlantic Roller" (209), by Viscount Maitland, does not impress one as very real, nor does it show the scale of what, from the title, we presume was a pretty large wave. There are some portraits that are very effective and original-looking; such as Mr. F. W. Lee's "Ruth" (32), and Mr. Frederick Hollyer's portrait of Mr. Sauter (124). There are others, like Mr. Richard's "Darawa" (14) which have the appearance of red crayon sketches; are these produced by a photographic process properly so called? One may ask the same question as to the pretty delicate heads by Mr. Watts Lee (42 and 50), which have somewhat the appearance of small pencil sketches. The use of real figures with subject pictures still shows us how much we owe to the painter in the treatment of figures in art. Mr. R. W. Robinson's "The Deserted Nest" (121), for instance, children in a field, is Mrs. Allingham without the

charm and poetry of the figures. Mr. Puyo's "Promenons nous dans les Bois" (16) is more successful than usual as a landscape and figure subject. Then we find in one picture a group of Phyllis and Prue (7) by Mr. Craig Amian, and then the same young women doing duty in another interior (134) as "The Burgomaster's Daughters." There are some pretty fancies in the exhibition, such as Miss Carine Cadby's "Roseleaves" (2), a brown silhouette of spray on a flat ground, and "Three Trees" (35), a small photograph of three nearly bare trees seen against the sky. On the whole, we think the Photographic Salon certainly increases in interest.

#### ECCLIESIASTICAL AND EDUCATIONAL ART EXHIBITION AT BRADFORD.

IN connexion with the Church Congress, which is being held at Bradford this week, an Ecclesiastical and Educational Art Exhibition has been opened in a building specially erected for the purpose in Morley-street. The exhibition is divided into two sections—a loan collection and a trade or general division. The former contains a few examples of old work, amongst which may be mentioned two fine silver flags, two cups, and an alms-dish from Kirk-leatham Church, dated 1670, which were given to the church by Sir W. Turner, Lord Mayor of London; a silver dish supposed to have been washed up on the shore of Coatham from a Spanish ship—it was given to the Lord of the Manor, who presented it to Kirk-leatham Church (it appears to be Spanish of the Plateresque period); a very beautiful silver gilt chalice and paten from the Church of St. Faith, Bacton, Herefordshire, of fifteenth-century workmanship—it has the name John Caputt or Capall stamped upon the base; the paten, too, is a very good one. There is another chalice, very similar in design, from Hinderswell, Yorkshire. It was found about fifty years ago built into the wall of a pig-stye; it has a crucifixion engraved upon the base. A paten was found with it. Also to be seen in the collection are a fine repoussée cup, with the London Hall mark 1662; an Italian cup in copper gilt, lent by the Leeds Clergy School; a large alms-dish in repoussée copper, from the Bradford Parish Church; and a repoussée paten from Putley Church, Ledbury, Herefordshire, bearing the inscription: "The Gift of Mr. Hen (or) Gwille (Guillim) de Brain to the Parish of Putley, 1660."

Mr. S. Margerison exhibits a series of photographs, about 150 in number, entitled "What we see in an Old Church." The photographs, which are very good ones, are of old English churches, mostly in Yorkshire, and their screens, fonts, and other furniture.

After noting one or two pieces of old embroidery, we turn to the examples of modern work which are exhibited in the loan collection. Why they are here and not in the general collection with exhibits of a like kind is not very clear. The most prominent one, as it is exhibited in a case by itself, is a chalice for New York Cathedral, designed by Mr. W. Keith and made by Messrs. Keith & Co., of London. We are informed in the catalogue that "this chalice will vie in point of exquisite workmanship and richness of detail with any production of the old masters"; that "to adequately describe the great beauty of this chalice is almost impossible," and that "it is undoubtedly one of the finest specimens of modern ecclesiastical art workmanship that this country has seen." We are sorry that we cannot agree with the "expert" who gives the above description. The part of the chalice where it must be handled is a mass of small crockets, pinnacles, niches, cusps, and figures, all stuck on and so exceedingly sharp that it would be very uncomfortable to handle. Most of the other ornament on the cup itself, and on the base, consists of ribbons and strips of metal rivetted on, and the whole finished in the hardest, sharpest, mechanical way. It is, no doubt, a very costly chalice, but it has very little artistic value. The same remarks apply to another chalice lent by the Rev. J. Edward Vaux, which is ornamented with nearly 600 precious stones. It has little value beyond that of the stones, which are certainly very fine ones.

Messrs. Heaton, Butler, & Bayne, Messrs.



Jones & Willis, and Messrs. Mayer & Co., of Munich, exhibit stained-glass windows; they are all rather poor in design and drawing and colour; that of Messrs. Mayer & Co. belonging to the stained-glass period of 1850. This firm also shows a "Gothic" reredos in carved wood representing the Last Supper in a framework of the usual crocketed pinnacles and cornice. Of embroidered altar fronts there are many of the usual trade kind. Messrs. Austin & Paley and Mr. Knill Freeman show drawings of good modern Lancashire churches. One large case contains the Bradford Corporation plate; this is not ecclesiastical, its date is 1873, and, as it has no artistic value, one wonders why it is here.

We are sorry to have had to speak so severely of the modern work in the loan collection, and turning now to the general exhibition we cannot spare our condemnation here. Various firms exhibit the average collection of cheap crosses and candlesticks which usually fill the ordinary ecclesiastical shop, one of them showing no less than six samples of the usual cast brass eagle lectern. Messrs. Kayll & Co., of Leeds, show an altar panel in "opus sectile," which is better than most of the things in the exhibition, and has some good colour. Mr. A. O. Hemming, of Margaret-street, London, has a collection of drawings of church decoration and stained glass, some of which we are sorry to see has been carried out in Canterbury Cathedral; his designs are in the ecclesiastical decorator's Gothic manner. The educational part of the exhibition consists of books, stationery, &c., but chiefly illustrates what to avoid in furnishing a church. If one is to judge by the art work of this exhibition, then ecclesiastical art has come to a low ebb indeed. If the clergy wish to encourage art, then the exhibition should be reduced to about half the size, and only old work and specially invited and more personal modern work should be included. The art section should also be separated from the educational.

#### OFFICE FRONT, No. 8, GREAT GEORGE-STREET.

THE houses in Great George-street, originally built for residences, are now used as offices. In 1884 No. 8 was considerably damaged by fire, and it was determined to rebuild it in accordance with its present purposes. Accordingly, the height of the basement floor was considerably increased, and the attic story made of a good height and well lighted throughout. These conditions caused the violent disregard of the horizontal lines of the adjacent buildings, and the general independent character of the façade, as at present it stands. But it is almost inevitable that, owing to the value of the site, the remainder of the street is doomed to some such similar alteration, and that what now appears aggressive will merge into some conformity with its neighbours, as rebuilt. The materials—salt-glazed bricks and plate-glass—are, perhaps, the most unexceptionable for manufacturing and smoky towns.

HALSEY RICARDO.

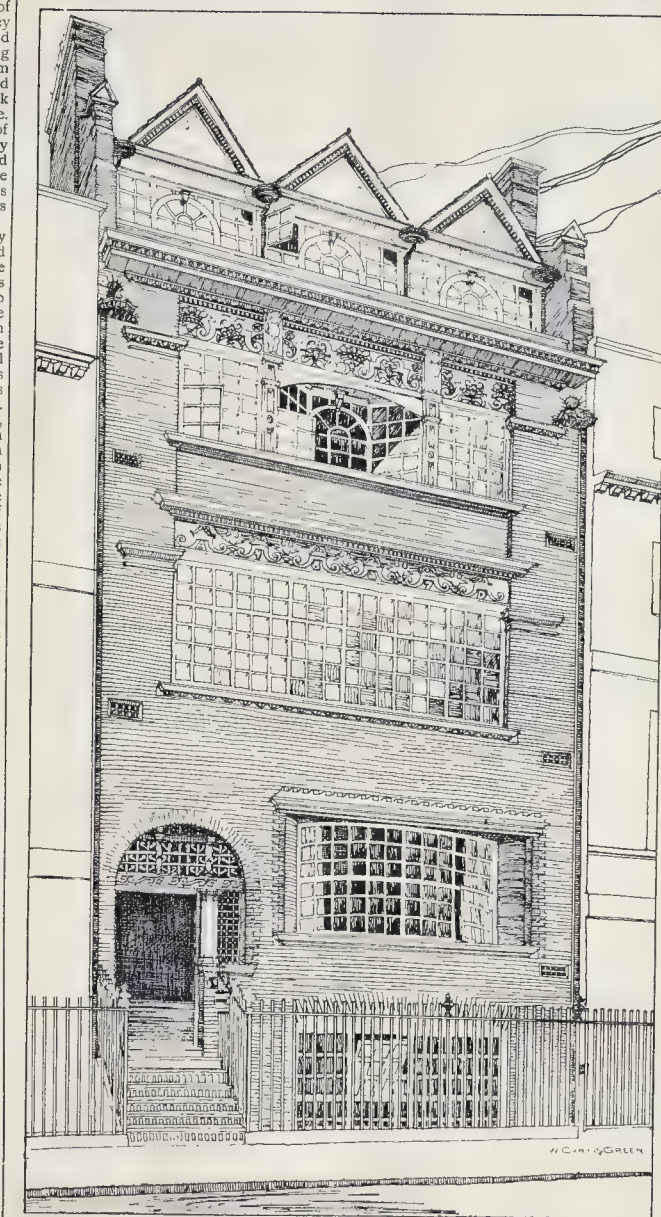
#### MODERN SANITATION.

By W. HENMAN, F.R.I.B.A.\*

SANITATION extends over so vast a field of scientific research that it is impossible for an architect or engineer nowadays, actively engaged in his profession, to do much more than watch the rapid developments brought about by many indefatigable workers in numerous fields of investigation, and intelligently to take advantage of the knowledge acquired by others, so as to apply it in the works with which he may be entrusted.

Engineers and architects are then the active agents by whom sanitary science is practically applied in permanent works for the benefit of mankind.

The noblest undertakings of modern engineers are those which tend to secure the health and well-being of communities, such as the provision of pure and abundant water supplies, drainage, irrigation, the supply of gas and electric lighting, the construction of railways, canals, bridges, docks, shipping, and other means of transport by which food and clothing are brought to our very doors, often



Sketches of London Street Architecture. No. XXIX. Office Front, No. 8, Great George-street, S.W.

from distant localities of production, and by which many are enabled to leave the crowded streets of cities and towns, to breathe the purer air of the seaside and of country places.

The natural tendency of the human race is ever more and more to congregate and form communities; it is then only by united action and expenditure that health can be maintained. Wherever such, however, is adequately exercised, statistics will show that vast populations may live within a limited area and enjoy as good, if not even better, health, than those in thinly inhabited districts where co-operation as regards sanitary matters cannot so readily be brought about.

Now that walled-in cities are no longer a necessity for protection, there is little reason why overcrowding should exist; there is gene-

rally open country around allowing, in most cases, of almost indefinite expansion, so that with good roads and easy means of conveyance from one quarter to another, large communities may dwell together, and by united action secure better health and greater comfort for the many than is the lot of those living in sparsely populated localities.

It is among these large communities that architects find their chief employment. It is expected of them not only that they will provide protection from the elements in the homes of the people, but that such will be healthy, safe, and pleasant places of abode; in addition to which they are entrusted with the erection of numerous buildings of public character, such as schools, hospitals, asylums, places of worship, assembly halls, hotels, theatres, shops

\* Address delivered before the "Engineering and Architecture" Section of the Sanitary Institute Congress at Birmingham, on Thursday, September 29, by Mr. W. Henman, President of the Section.



manufactories, and business premises; in one and all of which the amount of care and attention bestowed upon their design and construction, may very materially affect the safety, health, and well-being of a neighbourhood, and of numerous individuals, perhaps for generations.

It is well to impress this fact upon the public mind on occasions such as these congresses afford, and to insist that the function of architects is not alone to produce artistic designs and decorations, but by a careful application of sanitary science, a knowledge of natural laws, of the nature and properties of building materials, of the earth's surface on which they build, and of the air we all breathe, so to design and construct the edifices they erect that, without being devoid of suitable artistic expression, they may be convenient in arrangement, safe in construction, free from sanitary defects, or such as might cause bodily hurt, mental trouble, or untimely death.

That the public have not always, and do not even now in every case demand this, must be evident. Too often, through ignorance, or on grounds of false economy and favouritism, is the pretence or inexperienced hand employed. Consequently, as individuals either cannot or will not take care that safe and healthy buildings are erected for their use, the Legislature has stepped in, and by various Acts of Parliament, local by-laws, and numerous officials, endeavoured to safeguard individuals and communities.

The effect of this system is perhaps as good as can be expected, but it appears to me unduly to relieve many of personal responsibility which it would be better they should bear, and, because of the inflexible nature of all regulations, if strictly enforced, hardships in some cases must result, or where there is laxity, evasion is sure to follow; but the greatest evil is the lack of impartiality in administration apparent in some localities, so that instead of inspection and regulation, there is too often dictation and interference at the caprice of authorities or their officials, who may consider they have a right to interpret by-laws as they please, whether or not safety or health is in question; such action is not for the good of the community, individuals are irritated, and sanitary progress is retarded.

Moreover, in matters of sanitation there is much yet to be learnt, and there is reason to doubt the wisdom of many regulations which have from time to time been laid down in connexion therewith.

There seems to be a law of evolution in sanitation as in many another subject. Consider the degrees of advance in connexion with the disposal of fecal matter. Not so very many years ago every house had its privy, little more than a hole in the ground, close to the dwelling, where month after month excrement was allowed to accumulate; the fluid filth saturated the ground and contaminated the water supply drawn therefrom, while the putrefying solids poisoned the air around. Then came the cess-pool, more or less removed from the dwelling, and the water-closet developed; at first simply a pan down which an occasional bucket of water was poured to convey away the solids, then a water-pipe with tap was provided for the same purpose; odours became unpleasant, to say the least, so the "D" trap was invented, and following thereon the pan closet—that filthy retainer of fecal matter, still unfortunately to be found in many a house. Public sewers for conveying the objectionable matter to a common outfall were extended. Varieties of valve closets were introduced, and next came the "wash-out" pan, with a flushing cistern which, when acted upon, simply lifts the contents of the pan into the trap below, until another flush, perhaps hours after, causes it to move on. Now we have the "wash-down" and "syphonic" pans, which at each flush ought to be thoroughly cleared; but the same bodies who are appointed to regulate sanitary matters in the interests of the community, if they control the water supply, rarely permit more than a two-gallon flush, which generally proves insufficient for the purpose.

How reluctant some sanitary authorities are that we should be rid of our filth, and how they have from time to time retarded the natural order of development, notably by adopting such clumsy devices as the pan collecting system. It is, in fact, only by painful steps that excreta and other foul matters have been expelled from the near neighbourhood of dwellings. Not long since, in many districts, a "trap" was required at the foot of every soil-pipe, where

each discharge was stopped on its way immediately outside the house; there it remained until another discharge came to shift it onward. Even now the "trap" is simply moved on to the boundary of the site, often but a short distance from the dwelling. I predict the day will come when all such "interceptors" will be banished, together with every other "trap" and impediment outside of buildings, then there will be little, if any, of that half-putrescent matter now so often retained about buildings, creating sewer gases which find their way into our homes or assail our olfactory nerves as we pass along the streets and highways.

Useful as manholes and inspection chambers may be when judiciously placed, there are some localities where their unreasoning multiplication must in time cause serious nuisance. Where their number is excessive they retard the scour of the sewer and often become mere cesspools; filth is deposited around the sides, from which sewer gases are generated. Unfortunately, large pipes and the excessive employment of traps, manholes, and inspection chambers are the panacea of inexperience in those who undertake sanitary work.

With every house drain of suitable size well ventilated at its highest point by being carried straight up its full diameter clear above all windows, with plenty of street gratings for fresh air inlets to the sewers, ample flush of water, impervious and well-laid drains and sewers, all untrapped and free from obstruction, sewer gas, now so well known, might become a thing of the past only to be met with in laboratory experiments.

So soon as a drain from one dwelling joins another, according to law as at present laid down, it becomes a sewer, and from that point the architect, as such, has nothing more to do with it. The sanitary engineer then steps in. It is he who is responsible for the design and construction of the many arteries of pipes and conduits by which sewage is conveyed to the outfalls.

Much as architects may have erred in permitting defective construction in drains, others have sinned more deeply in the matter of sewers. Apart from their general design, the method of construction, and gradients adopted, actual work has too often been defective in execution, so that, instead of aiding the quick removal of solids by water carriage, they have acted as filters or separators, permitting the fluids to escape and soak into the ground or to run off and leave the solids to fester and become offensive.

I am, of course, speaking of what has happened in the past—no sanitary authority, architect, or engineer would now think of permitting such defects to occur. Yet, unfortunately, all are not agreed as to the necessity for preventing the formation of sewer gases, or even in accord as to the best methods of doing so, and, strange to say, although some of the "ills to which" flesh is heir" have undoubtedly been traced to the action of sewer gas, there are many keen observers who point to the general good health of sewermen and falling rates of mortality in its most concentrated essence, infer that after all, sewer gas is but a harmless though somewhat unpleasant guest. Others go less far, and, while pronouncing it harmless within the sewers or playing about the streets, will yet condemn it as a burglar and murderer should it enter a dwelling. Notwithstanding this divergence of opinion, and although sewer gas may not on every count have been found guilty, it is undoubtedly more prudent to regard it as a suspect, to permit it no entry to our dwellings, and to banish it from the streets and public ways. At the same time, care must be taken not to imprison it within the sewers, for then it becomes more virulent and should it find a loophole for escape, it may work untold ill.

In other sections during this congress much will doubtless be heard of sewage disposal, a subject of the greatest interest to sanitarians. A new era with regard to that question may be upon us, if what is now known as the "septic tank" fulfils the promise of its so-far rapid advance in public estimation.

Facility of disposal implies greater possibility of rapid removal from the neighbourhood of dwellings; and it what is claimed for the septic tank proves to be true, a dual arrangement of sewers and storm-water drains will be unnecessary. The periodic falls of rain can then, by means of collecting tanks or reservoirs, be utilised as a constant means for flushing and cleansing drains and sewers;

because it is held that, whatever the volume of the effluent, it may with safety be turned at once into the natural watercourses.

Sanitation has to deal with many subjects quite as interesting, if not so savoury, as sewers and drains. Every building we occupy, the houses in which we reside, the water or the fluids we drink, the food we eat, the air we breathe, the clothes we wear, the work we do, the recreation we take, all exercise their influence for good or ill upon health.

Because some diseases are marked in their characteristics, and frequently become fatal within comparatively short time, their causes are zealously traced and safeguards are devised. Yet how many continually suffer ill-health, are deprived of full vitality and capacity for useful employment and enjoyment in life, resulting, in the majority of cases, I do not doubt, from neglect of sanitary laws. But because the immediate effects are not made apparent, the causes are more or less ignored, investigation is imperfect, knowledge is indefinite, and popular prejudice is often at fault.

Careful and constant observation of cause and effect, together with frequent exchange of the views and ideas of observers and thinkers, may in time elucidate much that is now obscure regarding what is requisite for the health, strength, and consequent happiness of mankind. "Prevention is better than cure."

Probably the greatest obstacles to the advance of sanitary science are popular prejudice and the unreasoning adoption of materials, means, and methods which may be good under certain circumstances or conditions, but the cause of evils when wrongly applied or employed.

In this connexion is the question of the proper use of certain building materials. In most books on building construction will be found advocated, without qualification, as a rule, the employment of hard and impervious materials. Popular prejudice catches at the idea that hard materials must be the best and strongest, and those that are impervious must secure dry buildings, consequently the hardest of stone, the most highly-pressed bricks and tiles are demanded. In the daily press there is frequent advocacy for the employment of glazed materials for the entire exterior as well as the interiors of buildings, and in a few cases the suggestion has been followed; yet I find there are many observant architects who persist in what they consider better methods of construction. They seek for materials of permeable structure, having surface texture and variegated tones, with which they build in such a manner that, while securing adequate strength, there is no waste of good material. I venture to believe they are rightly aiming at a scientific method of construction, the best suited to secure health and comfort for the occupants.

To go into all the reasons of the why and wherefore would be out of place in an address such as this, but, broadly regarded, the difference is in a par with clothing oneself now, days in a suit of steel plate armour instead of in good woollen material; the plate armour was of some value doubtless in the days of hand-to-hand combat, but even then only employed for the purpose of protection. As a daily garb it would be ridiculous in appearance as well as injurious to health and comfort, whereas a suit of woollen material is serviceable and greatly to be preferred. From this comparison I must leave you to draw your own inferences.

Ventilation is another subject of primary importance from a sanitary point of view. How gloriously most people will talk about it, and how little it is understood by the general public. Popular prejudice and ignorance too often frustrate the best endeavours of those who have studied the subject and apply the knowledge they have acquired.

It is always remembered that regulations respecting the width of streets, the height of buildings, the prevention of overcrowding, the proper construction of sewers and drains, the cleansing of thoroughfares, and particularly of courts and alleys (which, by the way, ought not to be allowed to exist if every individual had a proper regard for his own and his neighbour's health and well being), the quick removal of refuse animal and vegetable matter from within and around dwellings, an ample water supply for domestic and cleansing purposes, the provision of electric lighting, and many another duty laid upon district authorities have one and all a direct bearing upon the maintenance of the atmosphere we breathe.



in a state of suitable purity, without which efficient ventilation is impracticable?

Fortunately, in this country it is possible in most dwelling houses to employ natural means for securing an adequate change of air on almost every day in the year. Yet there is much that an architect may do, by care and forethought, in planning, in the employment of suitable materials, and devising means so that such necessary change of air within may be brought about in a manner to secure comfort to the occupants. It must, however, be remembered that without due care and intelligent attention on the part of the occupants, efficient ventilation cannot be maintained.

In many buildings erected for public use the case is often different. Natural means cannot always be relied on for securing efficient ventilation, because mere change of air is far from being all that is implied by the term. In addition there must be suitable temperature and humidity of the atmosphere, as well as freedom from draughts. To meet these requirements mechanical means must be resorted to.

I venture to point with some degree of pride to one of the largest installations ever laid down, viz., that at the General Hospital in this city, a building erected from my designs. To Mr. William Key I give all credit for devising the engineering requirements for heating and ventilating that building; but I have no hesitation in saying, and feel sure he agrees with me, that success in such an undertaking is best secured when the architect, having made himself thoroughly acquainted with the requirements by which good ventilation can be obtained, works hand in hand with the ventilating and heating engineer, and designs the buildings on lines best suited to the methods to be adopted.

Frequent failures there have been in applying mechanical means for securing ventilation in large buildings. It is well to face that fact, and to realise the vast amount of prejudice resulting therefrom. My investigations convince me that such failures result from three primary causes:—

1. Too low an estimate of the volume of air required.
2. Want of efficient mechanical appliances.
3. Want of constant and intelligent management.

With regard to the first, even recent writers upon the subject of ventilation give a change of air three times per hour as a suitable requirement, and many professed ventilating engineers base their estimates on such inadequate provision. One firm had a laudatory article in a sanitary journal (2), recently published, of a newly introduced appliance, by which it is claimed that change of air within an apartment can actually be brought about once in every hour.

So long as architects and the public shut their eyes to the ascertained fact that a change of air from seven to ten times per hour is essential for health and comfort, failure must inevitably result.

The perfection to which mechanical contrivances can now be brought, and the ease with which electricity may be employed for motive power, make it practical to secure an adequate change of air within a building, however complicated may be its plan and arrangements.

The internal capacity of the General Hospital, Birmingham, equals two million cubic feet, and provision is made for propelling a total of twenty million cubic feet of cleansed and tempered air throughout the buildings every hour continuously, night and day.

The experience I have gained in this and other buildings, similarly ventilated on the plenum system, enable me to assert without hesitation that, with an adequate expenditure upon a properly equipped installation and careful management, there is no reason why efficient ventilation and warming should not be secured in every public building, with absolute freedom from harmful draughts.

The provision of dwellings for the working classes has for many years occupied the attention of sanitarians; because permanently good health cannot be secured in defective dwellings, and unless the health of the largest class is maintained, it constitutes a source of danger to the rest of the community. There are many reasons why homes for the labouring classes are often defective, but there is one reason which more than any other tends in that direction—it is the system of creating excessively high ground-rents.

There is a limit to the amount of rent which it is possible for working men to pay, consequently if the ground landlord is grasping in his demands there is little capital left to be expended on the buildings, and, therefore, they are scamped. I am no Socialist in the ordinarily accepted sense of the term, but I put upon land for building purposes—particularly that required for the houses of the working population—is a leading cause of bad building, the result of which is impaired health in the community from which the landowner, as well as members of his family, may perchance suffer more severely than they would from a slightly reduced income following upon less exorbitant demands for ground rent.

I must not trench further upon your time. This phase of the question may be treated in the paper promised to our section, and there are other papers which should claim your attention. It is to be hoped the discussions which may follow upon them will add to our general sum of knowledge, possibly we may not all be of one mind on the subjects to be brought before us, but if each will approach them with a sincere desire to evolve the truth, there can be little doubt the result will be individual benefit and ultimate good to the community.

#### THE ARCHITECTURAL ASSOCIATION: SUMMER VISITS.

THE last summer visit of the Association took place on Saturday, September 24, when a party, including the President, went down to Rochester. At the Cathedral the visitors were met by the Dean, the Very Reverend S. Reynolds Hoie, by whose permission the visit took place.

Mr. Payne, the Honorary Secretary of the Kent Archaeological Society, conducted the visitors over the cathedral, and pointed out the various features of interest with which the structure abounds. In a slight notice of the early history of the town, Mr. Payne mentioned that the first church was founded in 604 A.D. by Justus, the first Bishop of Rochester. The outlines of the eastern end of this church, having been discovered in recent years near the west end of the cathedral nave, have been marked on the pavement of the latter by the order of the Dean and Chapter. This first church terminated in a semi-circular apse. After a short description of the main features of the building, and the dates at which they were erected, Mr. Payne explained the reason for the close proximity to the Cathedral of a separate church by recounting how the parishioners of St. Nicholas, having an altar in the Cathedral, had disputes and disturbances with the Monks who had their celebrations in the choir, and in order to obviate this, the latter granted to the parishioners the ground adjacent, whereon they built themselves a separate church.

The central tower, built by Hamo de Heve in the thirteenth century, was cased externally in 1825 by Cottingham, and so pleased were that architect's patrons with his work and design that he was presented with an honorarium of 1000l. The sequel to this is interesting, for the Dean showed the visitors Mr. C. Hodgson Fowler's design for the remodelling of the tower from the roof upwards and the replacement of a short lead-covered spire after the manner of that removed by Cottingham. This resembles the healthy disregard shown by immediate predecessors for the work of their choir. Mr. Payne pointed out the coloured decoration on the walls, executed by the Heralds' College. In design it is said to be a copy of the original decoration of which, indeed, there are some remains, but in execution it is hard and uninteresting to the last degree. There are many other efforts at decoration about the choir which are, sad to say, but sorry testimonials of the artistic powers of the English of the nineteenth century.

Many interesting tombs were pointed out, among others that which is with some doubt conjectured to be the tomb of William of Perth, the patron saint of Rochester. It was from the offerings at the shrine of this saint that the expenses of the building of the choir were defrayed by William of Hoo, sacrist, between the years 1113 and 1124. Two other interesting tombs are that of John de Sheppey, bishop, whose recumbent effigy is fully painted, and that of Walter de Merton, the founder of Merton College, Oxford.

From a will of a former bishop, it has been

ascertained that the cathedral once possessed a golden figure of St. Andrew. The existence of this figure was till recently unknown. A portion of a wall painting, representing the wheel of Fortune, was exposed in recent years, on the removal of a pulpit, and is still to be seen on the north wall. The cloister garth, with the few remains of the Norman arcades, were next inspected, after which the very fine and extensive crypt, partly Norman and partly Thirteenth Century work, was visited. In one portion of this are stored all sculptured fragments found about the cathedral, and there are some exquisite remains of the canopy of the tomb of John de Sheppey.

By the permission of Mr. Aveling, the owner, and Major-General White, R.E., the occupier of Restoration House, the party next visited that interesting Jacobean mansion. As is well known, it derives its name from the fact that Charles II. slept there on his way back to London for the Restoration. The house has rubbed brick rusticated dressings round its moulded oak mullioned windows; it has also a fine main staircase and other interesting details of woodwork, besides which there are a series of wall-paintings, executed by Mr. Aveling himself, in a broad and decorative style.

After leaving Restoration House, the visitors returned to the Deanery, where they were hospitably entertained. Before leaving, Mr. Fellowes Prynn proposed a vote of thanks to the Dean, which was carried by acclamation. Subsequently Mr. Payne conducted the party to the Castle, where he explained the nature and history of the wall of the outer bailey, and pointed out several interesting features in the Keep. He also stated that the Keep was built not by Gundulph but by Archbishop Corbeul in 1126-30.

The enjoyment of the visit was very much enhanced by Mr. Payne's admirable exposition of the chief points of interest, and the Architectural Association owes him very hearty thanks for his kindness and courtesy. W. B. H.

#### ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—On Tuesday evening, September 20, the opening address of the winter session was delivered by Mr. Geo. S. Hill, President, his subject being "Architectural Tradition and Precedent." The distinction implied between the terms was gone into closely and clearly, noting that the acquaintance of history of any particular branch of work was invaluable for many reasons, but at all times the element important to us, which is entirely absent from the past, was the present, and all that it implies. Every young designer was advised to obtain a clear and articulate idea of the position held by these great factors, as by their aid the superficial attractions of quaintness and eccentricity can be evaded when his hand can be laid upon what he knows infallibly to be good. It requires but a lively, if not over-refined, fancy to impart to present conditions a clothing never before represented. This is all that much of the modern work has to depend upon. In it oftentimes lies something analogous to the abnormal, the freak in nature which is never pleasing. The rationale of such architecture is in the designers themselves, and they are the only court of appeal by which it might be judged, taking refuge from outside criticism behind the assertion, "but you do not understand." Mr. Hill pointed out that the great epoch-making features and characteristic forms were not the outcome of any feverish desire for something new, but came by the pressure of their own manifest advantages, and concluded his address with the truism, "That to advance wisely we must refresh ourselves liberally from the past."

RESTORATION OF ST. MARY'S CHAPEL, ABERDEEN.—This work has now been finished, and the re-dedication ceremony takes place to-day (October 1). The old oak panelling has been fitted up as a dado round the chapel. The arms of the city of Aberdeen are represented in a panel used as a pulpit back, and the pulpit is surmounted by a canopy also of old material. The Holy Table is of Corenne granite, and on it are two decorative lead panels containing the arms of Lady Elizabeth Gordon, who founded the chapel, and of Sir John Gordon. The building was formerly known as Cocklarachie Chapel. In modern times it has served as a meeting-place for the Presbytery of Aberdeen. Messrs. A. Marshall Mackenzie, G. G. Jenkins, and W. Kelly, of Aberdeen, were the architects.









New Doors to Choir Vestry, Tadcaster Church. Messrs. Bromet & Thorman, Architects.

#### NEW CHOIR DOORS, TADCASTER CHURCH.

As mentioned on another page, the Church of St. Mary at Tadcaster has been recently enlarged. The drawing here given shows the new doorway and doors to the choir vestry, which are executed in oak with tracery panels and leaded lights. Under the cornice is carved a representation of the Wise and Foolish Virgins.

Messrs. Bromet & Thorman are the architects. The drawing of the doorway was exhibited at the Royal Academy this year.

#### THE SANITARY INSTITUTE CONGRESS, BIRMINGHAM.

The seventeenth Congress of the Sanitary Institute is being held at Birmingham this week, the proceedings having commenced on Tuesday with a reception in the Council Chamber, Council House, by the Lord Mayor of Birmingham. Very complete arrangements have been made for the success of the gathering, several public buildings having been set aside for the purposes of the Congress. The general reception-room, which includes inquiry office, reading-room, &c., is located in the Town Hall, Paradise-street, and the con-

ferences, meetings of sections, presidential address, &c., have been carried on in three different buildings, viz., Mason University College, the Birmingham and Midland Institute, and the Council House, while the Health Exhibition has been arranged in Bingley Hall.

In addition to five conferences, viz., Municipal Representatives, Medical Officers of Health, Municipal and County Engineers, Sanitary Inspectors, and a conference of ladies, the work of the Congress is being carried out by the following sections, viz.:—Sanitary Science and Preventive Medicine (Dr. Alfred Hill, President); Engineering and Architecture (Mr. W. Henman, President); and Physics



Chemistry, and Biology (Dr. G. Sims Woodhead). The Congress is being attended by about 1,600 members and visitors, and by 800 delegates from various sanitary authorities.

At the reception of the members in the Council Chamber, the Lord Mayor (Mr. Councilor Beale), in welcoming the Institute, said that the Congress would find no lack of interest in Birmingham.

Sir Douglas Galton, Chairman of the Council of the Institute, briefly acknowledged the Lord Mayor's welcome.

Major Lamorock Flower also thanked the Mayor on behalf of the members, as did Sir Joseph Ewart on behalf of the delegates.

An adjournment was then made to the Grand Hotel, Colmore Row, for luncheon. The Mayor, who presided, proposed the toast of "The Sanitary Institute," and referred to the fact that the Institute has been in existence twenty-two years, having been established in 1876. He directed attention to the educational work of the Institute, and referred to its examinations for sanitary inspectors.

Sir Douglas Galton, in response, said he had been associated with the Institute since its foundation. He thought the present meeting would be the most successful gathering they had ever held.

Sir Joseph Fayer, President of the Congress, submitted the toast of "The Lord Mayor and Corporation of Birmingham," and Mr. Alderman Cook responded.

#### *The President's Address.*

An adjournment was then made to the Birmingham and Midland Institute, where Sir Joseph Fayer, Bart., delivered an inaugural address. In the course of his remarks he said he proposed to take a brief general survey of progress during recent times. Among many subjects of interest which were laid before the Queen on the completion of the sixtieth year of her reign, few, perhaps, if any, afforded better ground for congratulation than the improvement in the vital statistics of her people, as shown by reduced death-rate, enhanced expectation of life, decline in some of the most potential death-causes, and the almost total disappearance of others. In effecting this improvement the Institute had taken an important part. It was the outcome of the impulse given to sanitary science by the Public Health Act of 1875, which itself was a result of the growing conviction that public health was a subject which demanded more consideration than it had hitherto received. The object which the Institute had kept steadily before it from the outset had been the advancement of sanitary science by the promulgation of sound scientific and practical teaching of those principles on which health depends, by which life is prolonged, and the physical and thereby the moral welfare of the people promoted. Its work was effected entirely by private enterprise, unaided by any subsidy either from Government or other public authority, by which it was from time to time consulted, and to which its services were most willingly rendered. As an illustration of the progress made it might be stated that when the first Congress took place in 1877, there were 130 members and the income was 240l. In 1896 the members were 2,100 and the income 6,000l. In 1877 five candidates were examined for certificates, in 1896 521 were examined, of whom 300 obtained certificates. But the Sanitary Institute was by no means the only source of instruction in matters relating to hygiene and preventive, or State medicine, for all our medical schools and universities, the Army and Navy Medical Schools at Netley and Haslar, and many technical schools now gave instruction in those subjects, and the universities and Colleges of Physicians and Surgeons attested the fitness of candidates for the diploma of public health. One great national reproach, moreover, had lately been removed by the foundation, by private enterprise, of the Institute of Preventive Medicine, with which was amalgamated the College of State Medicine. The object of this Institution was to search out the causes of disease, a knowledge without which we could not hope to deal effectively with modes of prevention. The Medical Departments of the Navy, the Army, and the Local Government Board, the Army Sanitary Committee, the Royal Institute of Public Health, many municipal and rural health societies, and societies of Medical Officers of Health, were actively employed in extending the practical application of the knowledge imparted by the various educational

institutions as well as by individual research. It was only comparatively recently that preventive, as distinguished from curative, medicine had assumed the position of a science at all; it was now, from a hygienic point of view, the more important of the two, though the difficulties attending its application were still considerable and largely such as arose from ignorance and incredulity. Half a century ago the great mass of the population lived and died under conditions which violated all the now well-known principles on which health depends; prejudice, ignorance, and vested interests stood in the way of progress, and but little effort was made to correct the one or remove the others; Government looked on with indifference; the people knew little, and thought less, of the efficacy of pure air, pure water, cleanly and uncrowded dwellings, temperance, and other conditions which were now well known to be essential to health. They had no idea that infective disease was but too frequently the scourge of uncleanness, overcrowding, and disregard of simple laws of health. Under the influence of such reformers as Chadwick, Parkes, Richardson, Simon, Southwood Smith, Sutherland, Bristow, Buchanan, Netton Radcliff, De Chaumont, Corfield, Thorne, Notter, Seton, L. Parkes, Ballard, Power, A. Hill, Armstrong, Russell, Littlejohn, Cameron, Smith, Ransom, and others, to say nothing of Sanitary Engineers such as Rawlinson, Galton, Rogers Field, Hawkesley, Mansergh, &c., measures which were regarded as mere theories or fads of no practical value, were now accepted as of cardinal importance. Statesmen had learnt to realise that Sanitary Science came well within the sphere of practical politics, and that it was an important part of the duty of executive governments, whether general or local, to protect the people from disease which might be prevented or controlled. Numerous Acts of Parliament had been passed, such as the Public Health Act of 1875, Rivers Pollution Prevention Act 1876, Public Health (Water) Act 1878, Acts for Housing the Working Classes 1885 and 1890, Infectious Diseases Notification Act 1889, Infectious Diseases Prevention Act 1890, Isolation Hospitals Act 1893, Public Health Act for London 1891, and many others. Officers of Health, Sanitary Engineers and Sanitary Inspectors had produced a better state of things; the poor were no longer left to be a law unto themselves on such matters. Public health was cared for in a sense which was utterly unknown in the past; houses were better built, sewerage, drainage, and ventilation were provided for, the land was better cultivated, the subsoil better drained; the absolute importance of pure drinking water was recognised, food was more varied and more nutritious in its character, clothing was better adapted to climate; and were all the existing official provisions enforced, little would remain to be desired on the part of the executive government; but as some of these Acts were permissive, not compulsory, and as others were utterly neglected, much of the benefit they might confer was lost. Though education had done much as far as the better classes were concerned, and upwards of two hundred millions had been spent on sanitary work, with great benefit to the public health, popular teaching and example, and the general diffusion of education, were still necessary in order to convince the proletariat of what so intimately concerned their vital interests. The death-rate was susceptible of further diminution, expectancy of life might be enhanced, and the general conditions of living and exemption from certain forms of disease were by no means as perfect as they might be; tainted water was still drunk, as was illustrated by the condition of Maidstone and Lyme Regis last year, where an extraordinary visitation of typhoid fever was traced to impure water, showing either that legislation was imperfect or that its provisions had not been duly observed. Chimneys still vomited forth their smoke and chemical fumes, rivers were still polluted, cesspools and imperfect drains, badly constructed, ill-ventilated houses, and so on, still defied alike the sanitary law and common sense; and it would, perhaps, not be until the more complete organisation of the public health administration under a Minister of Public Health was effected, that the full benefits of sanitary legislation would be realised and the people attain to that standard of health and duration of life for which they had a right to hope. Even our great cities

with all their improvements left much to be desired. Notwithstanding Acts of Parliament, all the efforts of sanitary authorities, all the advice that might have issued from this and other similar sources, serious defects remained.

The President, having referred to the rate of mortality in large towns, and having quoted Sir Henry Burdett in regard to certain health matters in London, spoke of the abominable and insanitary practice of sending out the vestry dust-carts to take away the house refuse at all times of the day. This proceeding was not only offensive to the eye and nose, but prejudicial to health. It ought to be promptly discontinued, and on no pretext ought dust-carts to be allowed in the streets after an early hour in the morning. Recent discussions in the House of Commons showed that the question of pure-water supply also had not yet been satisfactorily settled or brought under the control of the sanitary authorities. It was to be hoped that disputes upon a question of such vital importance would not long remain unsettled. Nevertheless, when we contrasted the present state of our country with its twenty-nine millions of inhabitants, with that of the Elizabethan era with its few millions, we had ample proof of the ignorance of science in those days and of the great improvements which had taken place in these. When we thought of the ill-ventilated dwellings, the ill-built towns and villages, the narrow, unpaved, unlighted streets, uncultivated, marshy country, unreclaimed land, the wretched houses, often of wood or earth, without drainage or ventilation, with floors covered with straw or rushes saturated with filth and reeking with noxious miasmata, the stagnant gullies and open cesspools, to which must be added the wretched diet, the intemperate habits, and frequently the most impure water, we could understand how under such conditions disease found a congenial nidus, and frequently assumed the epidemic proportions in which it proved so destructive to life. But could we feel confident that our immunity could continue? He was afraid not. Sudden invasions of cholera and other epidemics, and, as now, of plague in India, were warnings that our vigilance must never be relaxed. But the experience of our country under the greatly-improved sanitary administration of the present time had shown how much we might rely on preventive measures wisely enforced, especially when these were based on experience and enlightened observation, and not upon mere theories of causation.

The President then dealt with the statistics of some well-known diseases, showing that they had become less severe in their incidence if not less frequent in their recurrence, and how far they were thus subject to the influence of hygienic measures. Continuing, he said one indication of the effect of sanitary work was observed in the death-rate of the country. In 1841-50 it stood at 22.4 per thousand; in 1891-95 at 18.7 per thousand; but for the four years 1890-1893, it had risen owing to epidemic influenza, the lowest rate, 1884, having been 16.6 per thousand. It varied considerably according to locality. In some parts of England, where health was the main object considered, it had been as low as 9 per thousand; in others, where the chief objects were manufacture, trade, or money-making, it had been 30 per thousand. The death-rate was susceptible of considerable modification, and we knew how it might be increased or diminished; it behoved the nation to exert its power and stand credited with the lowest figure. In fact, it was, within certain limits, at our own control, and whether the people should die at the rate of 13 or 23 per thousand depended on how we recognised our responsibility and put in force sanitary regulations. It was mainly a question of finance. Our sanitarians could say how it was to be done, and were perpetually saying it, but more money, more faith, more energy were needed to deal with this question satisfactorily. From a comparison of the tables of 1841 and 1881-90, it was seen that the mean expectation of life had increased both for males and females up to the age of thirty, but diminished after that age, showing that though improved sanitation saved more children's lives, the conditions of life being harder as time progressed, the expectation of adult life had become rather less; for the very causes which enabled the weak and sickly to survive had perhaps in the end thus tended to diminish the value of the adult life of such survivors.



The President also referred to the beneficial results of sanitary work in India during the last half century, and, in concluding his address, he said it could not be doubted that the Sanitary Institute had already done excellent work, and had contributed its share to the advance which public health had made since its foundation. The Spirit of Hygeia was abroad, and measures for preserving health and preventing disease, which at no very distant period in the past were looked on as mere hypotheses, were now, notwithstanding the obstacles to research arising out of ill-considered sentimental opposition, regarded as of vital importance, and an integral part of the basis of the system of administration on which the public health depended.

On the motion of Earl Beauchamp, Chairman of the Health Committee, Worcester, seconded by Councillor Martineau, a vote of thanks was accorded to the President for the address.

The President having replied, the meeting terminated.

In the evening the Lord Mayor opened the Health Exhibition at Bingley Hall.

#### Conference of Municipal Engineers.

On Wednesday the five conferences were commenced at Mason University College. The Municipal and County Engineers met in the Physics Lecture Theatre, and the President (Mr. T. de Courcy Meade) opened the proceedings by reading an address. He referred to some Manchester matters to which he is at present giving special consideration, commencing with the housing of the working classes. The difficulties, he said, of providing sufficient suitable accommodation at reasonable cost for persons of the working class displaced from insanitary areas, or from areas cleared for street improvements and railway works, were in many instances very great, and were greatly enhanced by the tendency to overcrowd, which, in many cases, unduly increased the number of persons to be provided for upon areas already too limited. These difficulties had been met in Manchester by the erection, on the cleared sites, of (a) blocks of five-storied tenements approached by a common stairs and balconies, (b) blocks of tenements of two and three stories, with separate entrance and stairs to each set of tenements, (c) terrace cottages of five rooms each, (d) a model lodging house. The Manchester Corporation were also erecting (e) cottage dwellings in the outskirts of the city, about two and a half miles from the cleared areas, where land was less costly; these cottages varied somewhat in character and contained from five to seven rooms each. The buildings class (a) had been occupied about three years, and were let at rents which yield a moderate return upon the cost of erection. The two blocks (a) of five-storied buildings cost about 87,000*l.*, exclusive of the cost of sites. The latter with old buildings thereon cost about 54,000*l.* Single-room tenements were let at 2*s.* 6*d.* per week, the rent of two or three roomed tenements varies from 3*s.* to 5*s.* per week. In addition to the above-mentioned new buildings, much had been done in the improvement of existing dwellings, and the conversion of "back-to-back" houses into "through" houses. This work, though excellent where it was effected, had a tendency to cause overcrowding elsewhere, as the number of persons that could be accommodated in the converted and improved dwellings was much less than was crowded into the "back-to-back" houses before alteration. In all cases the groups of pail closets used by the occupants of one or more blocks of houses were removed, and that each "through" house was provided with a proper water-closet. The substitution of private water-closets for common pail-closets and privies was thus gradually proceeding, but would doubtless be a work of time. There were at present in the City of Manchester 76,913 pail-closets 22,090 privies, and 13,014 middens; but these numbers were annually becoming less, as water-closets were being provided wherever alterations to property were effected by the Corporation.

The President then gave a few particulars of the cost, &c., of sewage treatment at the Manchester outfall works.

On the motion of Mr. E. G. Mawbey, Leicester, seconded by Mr. Yabbicom, Bristol, a vote of thanks was accorded to the President for his address.

#### By-laws Relating to New Streets and Buildings.

Mr. J. S. Pickering, Nuneaton, then read a paper entitled "By-laws Relating to New Streets and Buildings."

It is scarcely possible within the limits of a short paper to make any detailed reference to by-laws affecting new streets and buildings. It is more with a view to elicit an expression of opinion on the subject generally that it is introduced. It is proposed to refer more particularly to by-laws made in England under the provisions of the Public Health Acts rather than to by-laws made under local Acts, but the author's remarks will apply in some measure to by-laws with reference to sanitary matters in general.

The Public Health Act, 1875, empowers Sanitary Authorities to make by-laws with respect to new streets and buildings, and repeals previous Acts under which such by-laws were made. But it provides that by-laws made under these repealed Acts are to be deemed by-laws under the Act of 1875 if not inconsistent with the provisions of such Act.

In 1877 the Local Government Board drew up a "Model" series of by-laws for the guidance of Local Authorities. These have been somewhat amended from time to time, and have been framed with great care and under the best legal advice. What is also of the utmost importance, their provisions are considered to be in accordance with the statutory enactments by which they are authorised. But notwithstanding these conditions the "Model" by-laws have not been received with general approval.

It is true that by-laws made since the passing of the 1875 Act generally adhere closely—and in the greater number of cases almost word for word—to the "Model" series, but this is not so much on account of their general suitability to the districts for which they are adopted as to the fact that the Local Government Board will not sanction any important departure from their "Model" code. The result is that many authorities do not possess any by-laws at all, others depend upon by-laws of doubtful validity made under former Sanitary Acts, while the great majority do not enforce the particular by-laws they have been compelled to include in adopting the "Model" series.

It is somewhat astonishing that this state of affairs should be allowed to continue with the extension of local government which has taken place in the country, and when there is a general desire on the part of Local Authorities to carry out the provisions of the Sanitary Acts.

The varying circumstances of different districts make it impossible to frame a series of by-laws applicable to all. By-laws, for instance, affecting new streets and buildings in large towns would be altogether unsuited to the requirements of, say, the villages of rural districts. But obvious as this is, it is a matter which is overlooked, and accounts for the absence of by-laws in many rural sanitary districts.

Section 157 of the Public Health Act, 1875, provides that every Urban Authority may make by-laws with respect to the following matters: the level, width, and construction of new streets, and the provision for the sewerage thereof; the structure of walls, foundations, roofs and chimneys of new buildings for securing stability, and the prevention of fires, and for the purposes of health; the sufficiency of the space about buildings to secure a free circulation of air, the ventilation and drainage of buildings, and the closing of buildings unfit for habitation.

Surely these provisions are of sufficient importance to make their adoption imperative. Possibly twenty-three years ago when the Act came into force it would not have been desirable to make the adoption of by-laws compulsory, but considering the advance of sanitary science since 1875 and the general determination of the community to live in greater comfort, and consequently under healthier conditions, there now appears to be no valid reason against the adoption of proper by-laws in every sanitary area. It is evident that the Legislature do not accept this view, or they would not continue to make the adoption of important sanitary measures permissive on the part of Local Authorities.

The Public Health Acts Amendment Act, 1890, contains many important provisions affecting the health of the community, but they cannot be put into force without months of delay in complying with the wearisome details provided for in the adoption of the Act. Section 23 of this Act gives to Sanitary Authorities increased powers as to making by-laws affecting new streets and buildings. Under this section a by-law may be made with refer-

ence to the height of bedrooms and other rooms used for human habitation. It seems almost incredible that until the passing of the 1890 Act, Sanitary Authorities had no control over the height of such rooms, although many authorities possessed a by-law fixing their minimum height. This was one of many by-laws inconsistent with the provisions of the Public Health Act, 1875, and therefore *ultra vires*, but it has been carried out as though it possessed full legal force.

In many of the larger towns by-laws made under the Public Health Act, 1848, the Local Government Act, 1858, and other Acts repealed by the Public Health Act, 1875, have not been amended, though repugnant to the laws of the country, and the Authorities possessing them prefer to retain these, trusting to their legality not being questioned rather than adopt the more modern by-laws as sanctioned by the Local Government Board. This position on the part of the Local Authorities should scarcely be possible; in any case it should not be a necessary position to take up in order to secure by-laws adapted for the health and convenience of a district, for it must not be overlooked that many of these ancient by-laws, as in the case of the one referred to, are eminently desirable, whatever may be said of their validity from a legal point of view.

By-laws made under Acts previous to the Public Health Act, 1875, are, as a rule, so conveniently elastic that this is another reason given for their retention in preference to the rigid by-laws of the present day. The following are specimens of the by-laws in force in a town with a population of upwards of 130,000:—

"The walls of every new building shall be constructed of such thickness as shall be approved by the said Council."

"The owner or occupier of every house shall provide proper ventilation in the drainage thereof by means of the rain-water pipe from the roof of the house, or by such other method as the said Council shall direct."

These are a striking contrast to the detailed by-laws referring to the thickness of walls and the ventilation of drains in the "Model" series, and yet they are only examples of similar by-laws in force in numerous large towns.

Another convenient old by-law is one giving the Authority discretionary power with respect to the enforcement of air space at the rear of buildings. The Local Government Board will not now sanction a new by-law which provides for this discretionary power. But most Sanitary Authorities, nevertheless, do not hesitate to exercise their discretion when an occasion arises, such for instance as in the pulling down and re-erection of a building where the provision of the by-law cannot be adhered to without considerable sacrifice of property. It may, of course, be contended that the air space is necessary for the health of the occupants of a dwelling wherever the building is situated, and more especially in a populous district where property as a rule is the most valuable. But an Authority has often either to allow a building to be re-erected (and possibly improved from a sanitary point of view) without the requisite air space, or submit to it being altered in such a way that it will not come within the scope of the by-laws as a new building. Discretion in a case of this description seems desirable, but it must be admitted that any general admission of discretionary power in the by-laws would probably result in frequent acts of indiscretion on the part of some Authorities.

By-laws of the "Model" series relating to the thickness of walls are seldom carried out in their entirety, especially where they have been adopted in the smaller towns and rural districts, where there is often a feeling that their enforcement may prejudicially affect the desirable growth of the district. So far as by-laws can be prepared to meet the varying conditions affecting the thickness of the walls of a building, the "Model" by-laws do not appear to leave much to be desired. Possibly the thickness prescribed for the walls of small houses up to three stories might be somewhat modified to meet the objections usually raised against them in the smaller districts; but there will always be a difference of opinion as to what should be regarded as the reasonable and necessary strength of a building, and much will, of course, depend upon the quality of the material and workmanship.

(Continued on page 293.)



## Illustrations.

### LANERCOST PRIORY.

**I**T may be objected that Lanercost, being a Priory, ought not to come into a series of the "Abbeys of Great Britain"; but, from an architectural point of view this is really only a question of nomenclature. A Priory is but a small Abbey, dependent on a larger one; the interest of the buildings is the same; and the church at Lanercost, which in this as in other cases is the main object of our illustration, is in better preservation than many of the Abbey churches.

Like many of the Augustine Abbeys, we find Lanercost beautifully situated in a valley, in a commanding position on the north bank of the River Irthing. It stands so accurately in the line of the Roman stations on the wall that it has been conjectured to be the site of Petriana, one of the missing Roman stations.

Turning for a moment to a few incidents in the history of the Monastery, it is recorded that when William the Conqueror parcelled out England among his followers he bestowed the whole county of Cumberland upon Ranulph de Meschines, the husband of his niece, and appointed him Earl of Carlisle or Cumberland. The Earl thus enriched and appointed, in accordance with the feudal tenures then customary, divided out his earldom into eleven baronies, one of which—the barony of Gilsland—gave to one Hubert de Vallibus or Vaux, a relative of his, who took his name of Vallibus from the Roman wall, which ran through his new possessions. Some time after this, the Scots raided the district, and after turning out the Norman granaries, laid it waste. Henry II. recaptured Cumberland from the Scots, and by deed regranting and confirmed the Barony of Gilsland on Hubert de Vallibus, then an extremely old man. He was shortly succeeded by his son, Robert, "a valourous gentleman and well learned in the law of the land." He it was who founded the monastery at Lanercost to commemorate the souls of his father and mother.

Robert de Vallibus, the founder, died without issue, in 1199 or 1200, and through succeeding members of his family the property passed to the Muttons, who were great benefactors to the Priory. From Margaret Multon, the heiress of De Vallibus, it passed to her granddaughter, who eloped at the age of seventeen from Warwick Castle with Ranulph Dacre in the year 1317. By their marriage the Gilsland estates came to the Dacres. The lands of the Vaux continued in the hands of the Dacres until the year 1569, when the family ended in three co-heiresses, by one of whom, "Bessie of the braid apron," they passed to "Beld Will Howard," the famous Lord Warden of the Marches.

In the year 1280, according to the chronicle of Lanercost, Edward I. and Eleanor, his queen, came to Lanercost, and the Prior and convent met them at the gate. The King presented a silk cloth to the Priory on this occasion, he also hunted in the Inglewood Forest, and took "two hundred stags and hinds."

In the April of 1296 the Scottish army, according to the chronicle, of 500 horse and 14,000 men, under the Earl of Buchan, marched on Carlisle, but being unsuccessful there, laid the surrounding country waste, with terrible barbarity, Lanercost and Hexham suffering severely, when in the midst of their destructive work at Lanercost news arrived to them that the King of England was close at hand with a large army, and so the Scots set off back, laden with their booty, after having burnt some of the Conventual buildings, but not the church.

The year following William Wallace ravaged the place again.

Some ten years later, in 1306, King Edward I. was too ill to head his own army in person against the Bruce, but travelled by stages to the Scottish marches in a litter carried by horses, and arrived at Lanercost Priory on Michaelmas-day, staying until Easter in the following year. Many important documents and writs were dated from Lanercost, including the one which banished for ever Piers Gaveston from the kingdom.

Again in 1311, headed by Robert the Bruce, the Scots visited the place and imprisoned most of the Canons. These Scottish raids caused the priory much harm and loss of income.

The luckless Priory had not yet done with Scottish invasions, for in 1346 David, King of Scotland, with his army visited it and was

received by the Canons, whereupon "the sacred vessels were thrown out, treasures were stolen, doors were smashed and reduced into nothingness everything attacked by them. Lanercost after this relapsed into 'obscurity, and never again raised its head."

A most important document in the form of a letter from Archbishop Bowet of York to his suffragan bishops is dated York, April 18, 1400, in which the Archbishop says that he has turned his attention to the poor canons, prior, and convent of Lanercost, whose monastery and most of its buildings, "as the prior with lamentable voice tells us," are threatened with ruin; their buildings and possessions, in consequence of frequent attacks from the Scots, are in ruins and burnt; their lands from the same reason lie uncultivated; in short, that the prior and convent are reduced to such poverty that they cannot nowadays live without the help of other Christians, nor serve God according to the rules of their duty. The Archbishop, who was a Black Canon himself, requests his bishops, when deputations from the Priory arrive to collect the money, to receive them well, to explain their errand thoroughly by means of the parish priest in each church, and to let them have the money collected without any deduction, and further grants subscribers to the restoration fund an indulgence of forty days. This letter is curious; it proves the antiquity of circular letters from a bishop directing collections to be made in the churches of his diocese for some object approved of by him, and it also hints that tolls were sometimes taken off the collections.

In 1536 was passed the Act for doing away with small monasteries, and in that year the Royal Commissioners began their visitation of northern monasteries at Hexham, where they met with armed resistance, which like a flame kindled up a rebellion all through the North of England.

The Prior of Hexham is said to have been "tied up" over his own gate; he of Lanercost, John Robinson by name, had better luck, and appears to have been made rector to a neighbouring parish over which the Priory had some rights.

The Convent thus rudely disestablished and disendowed, was of the order of Austin or Black Canons, belonging to a similar order as that at St. Mary's Priory, Carlisle, and St. Andrew's at Hexham.

After the dissolution, Henry VIII., by letters patent dated November 22, in the thirty-fourth year of his reign, granted to Thomas Dacre, the bastard, of Lanercost, in consideration of his truth and faithful services, the house and site of the late monastery and other property, rendering for the same to the King 9s. yearly.

This Thomas Dacre, in the year 1559, converted some of the Priory buildings into a dwelling-house. The last Dacre of Lanercost died without male issue, and the site of the Priory and lands reverted to the Crown, it being leased and finally purchased in recent years by the Earls of Carlisle.

Before the buildings were restored they were allowed to fall into utter ruin, the vaults were open, and, according to some writers, the corpses were exposed to view.

The income of the Priory at its dissolution was but £77. 11s. 11d. per annum.

On entering by the ancient round-headed gateway, whose ruins still form a picturesque feature in the landscape, we see before us the noble west front of the Priory, the lawn in front of it still retaining its character.

Examining the plan and general arrangements of the buildings we find the Priory consisted of a cruciform church, the transepts with eastern aisles, the chancel with aisles on both sides. The nave, as at Bolton Abbey and Brinkburn Priory, had no aisle on the south side. On the south side of the church were placed the conventual buildings, with the prior's lodge at the south-west corner, an arrangement usually found in priories of this order, as at Carlisle and Hexham.

At the west end of the church and conventual buildings stands an old border tower, pointed out as the tower in which Edward I. resided during his visit to Lanercost, which had possibly an outer court connecting it with the Priory. To the west of this stood the gatehouse, with porter's lodge, and remains extending from the gatehouse indicate the position of the stables, barn, and buildings connected with their farming operations.

Portions of the boundary wall surrounding the monastery are still standing.

Taking a general view of the interesting

architectural features of the buildings now remaining, the conclusion is forced upon our minds that there is a gradual progression of style in the buildings, as if the monks had improved in their designs as they proceeded. This gradual increase of ornamentation appears to have commenced with the choir and to have proceeded with occasional breaks, westwards, finishing with the west front. One does not here find an aisle added at one time or a transept at another, but a gradual progression of style, commencing from the very Early Transitional door on the south side and moving round the east end of the building to glide gradually through the very Early English to the perfected Early English west front; the difference being about seventy or eighty years. The probability is that the buildings took that time to fully complete, that at the consecration in the year 1109 only a small or temporary portion of the priory was built. We may conjecture that great part, if not all, of the original erection was at the time of the consecration built of wood. As the community grew more wealthy, they in part rebuilt and greatly added to their original building, availing themselves of every new development of style.

The greater portions of the buildings now remaining are of thirteenth century work. Examination, however, shows that a comprehensive plan had been made at the first, which was carried out as funds and time permitted, for we find the Early Transitional base course, extending along the south wall of the church, round the south transept as far as the chancel aisle, where it terminates.

The lower portion of the south transept walls and south side of nave, with the flat pilaster-like buttresses springing from the base course, are also of Transitional work.

These walls contain three fine doorways, simple in detail, but bold in character, one of them being an early specimen of the Pointed arch. All have detached shafts, with capitals of simple design.

The Conventual buildings on the east of the cloister-garth were also of this date, as is indicated by the return of the early base course in that direction; the Early Transitional doorway, inserted at the end of the north aisle and transept, may probably have been the doorway leading to the cemetery, or perhaps the Chapter House. The masonry of this early work differs in its uniformity from that of the later portion of the buildings, and is of grey freestone, each stone dressed and squared, and of unmistakable Roman character, most likely obtained from the Roman wall. The Transitional work is carried up to the string course of the nave, after that the work changes. After the year 1250 the Priory was considerably enriched, and it must have been one of the most flourishing periods of its history, the energy of the monks being concentrated on the building of the choir and eastern portion of the church, completing the cloister, the south and west sides being of this date. Prosperity still gleaming on the monastery, the nave from the choir westwards was completed.

We can see the change most marked in the clearstory, where from groups of Transitional boldness and simplicity it changes, keeping the same proportions and contour, to the more delicate mouldings of the Early English—with here and there a foliated capital, whose rareness adds to the beauty and charm of the work.

In one place we find a nail-head, and further on in same arcading of the clearstory we have the perfect dog-tooth ornament. In the later work much red sandstone appears, and the dressed work of all the late additions is of red sandstone. The choir, viewed from the nave before the erection of the modern east window, would be a feature of great dignity.

The nave has only one aisle, the transepts vary, but variety is most marked in the choir, where on the north side there is a groined aisle which gives us the three stages of triforium and clearstory, and on the south an aisle with open timbered roof, lofty arches, and no triforium—a difference evidently intended by the original design.

The capitals of the west doorway vary on each side. Foliage carving has been very sparingly used, but where it appears it is with beautiful effect.

The composition of the west front is very good; the bold projecting base course, the finely recessed doorway of five orders, well proportioned mouldings, the arcaded gallery above it, and the seven lancets alternately pierced, make an imposing west front.





THE ABBEYS OF GREAT BRITAIN. No. 27. LANERCOST PRIORY.

DRAWN BY MR E RIDSDALE TATE







E Widdsdale Tate Delo  
(Based upon plan by  
MR Charles J Wengerson FGA)



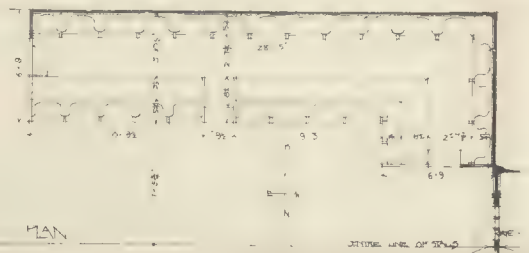


STAINED GLASS  
KING'S COLLEGE  
OLD ABERDEEN

WEST ELEVATION.



LOOKING SOUTH.



PLAN

DESIGNED AND DRAWN BY  
Jas. B. Halliday  
June 97

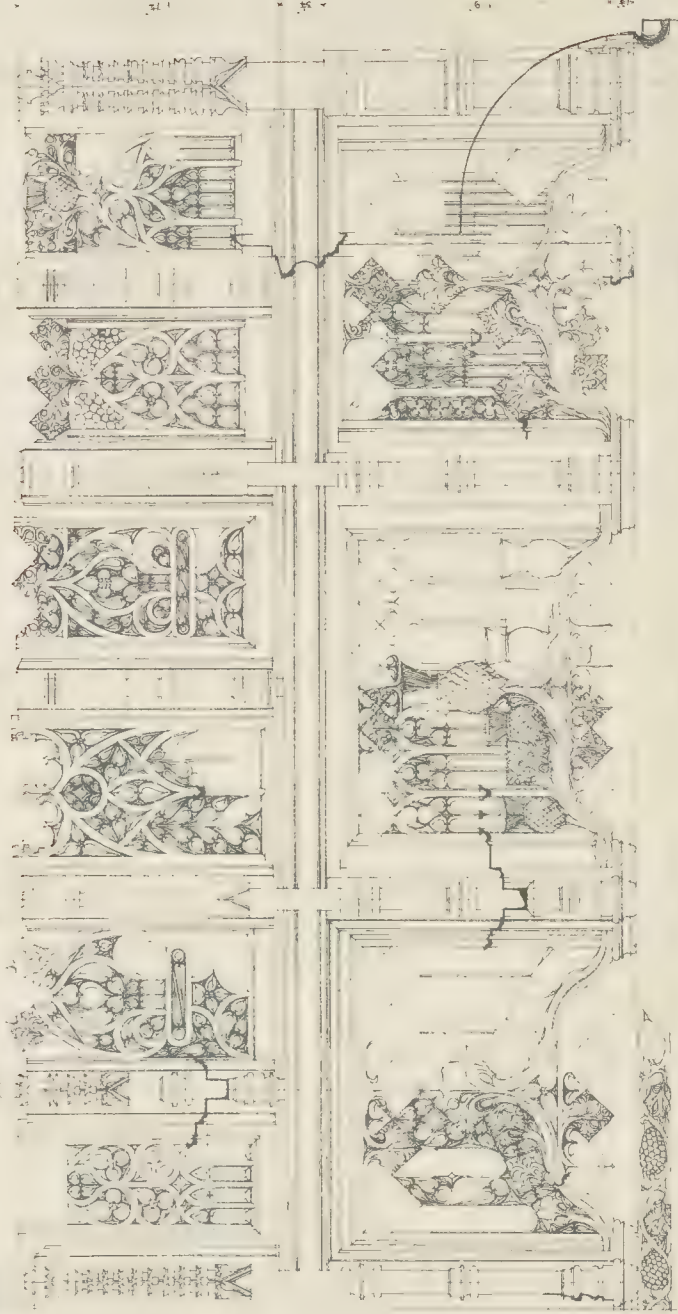


THE BUILDER, OCTOBER 1, 1898.

CHURCH OF THE  
 HOLY TRINITY  
 OLD ABBEY

CHURCH OF THE  
 HOLY TRINITY  
 OLD ABBEY

CHURCH OF THE  
 HOLY TRINITY  
 OLD ABBEY



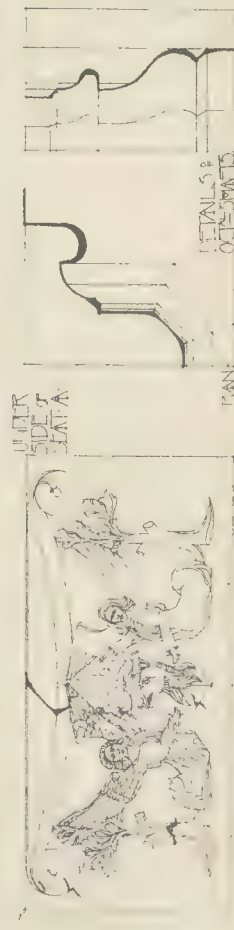
CHURCH OF THE  
 HOLY TRINITY  
 OLD ABBEY



# DUNBLANE CATHEDRAL OLD OAK STALLS



SIDE  
ELEVATION



DETAILS OF  
STALL END

PLAN

DETAIL OF  
CANOPY

DESIGNED AND  
DRAWN BY  
JAMES B. HENDERSON  
ARCHT. & DECOR.

1898. DUNBLANE CATHEDRAL





Beyond the rood we enter the choir with its chapels, a well-designed original piscina remains in the north-east chapel, in the north chancel aisle is an ambrie, as also in the east wall of the choir and remains of the piscina and double sedilia are visible in the south wall. Remains of the steps of the choir still exist, also of the steps to the chapels.

The windows on the north and south sides of the high altar have been widened, that on the north side being filled with Perpendicular tracery, the Dacre badge, the esclop shell, appearing over it. The chapel on the south side of the chancel was restored and re-roofed by the Dacres, judging from the fact that their badge appears on the corbels supporting the roof timbers; the windows may have been inserted by Thomas Lord Baron Dacre of Gilsland. He commanded at Flodden Field and died in 1526. His fine altar tomb stands in the archway between the south chapel and the choir, carved over with the arms of all the various baronies.

By the door in the west wall of the south transept we enter the cloister-garth, and on the north side of this doorway is the stoup. No traces of the ambulatory remain except the corbels for supporting the timbers of the roof. On the east side of the cloister, and adjoining the south transept, was probably the slype, leading to the Canon's cemetery, and beyond would be the Chapter House, with its vestibule, and then the staircases leading to the dormitories, which apparently were not cellared under, but which would be raised above the ground level. On the south side of the cloister-garth is a range of early cellarge with two doorways to it from the cloisters, and one from it to an outer yard. The west side is also occupied with early cellarge, and probably used as storehouses and stables. At the southern end there is a charming specimen of a simple groined apartment, with plain chamfered ribs, springing from moulded corbels, each corbel slightly differing.

Beyond was the Prior's Lodge, and over this cellarge was probably the parlour and library, and a hall for entertaining guests. This portion was afterwards converted by the Dacres into a dwelling-house. To the west of these, as already mentioned, is a tower, which possibly had an outer court. This tower would be used as a means of defence or refuge, also as a lodging for guests of distinction. On the west side of the tower we see remains of early work, so that in all probability there was an outer court fitted with the various offices necessary at that time. On the east of the Prior's Lodge, remains of a wall enclosing a small kitchen yard may be traced.

A few years later than the date fixed as the zenith of the Priory's prosperity, misfortunes commenced; in 1291 the Scotch came and burnt the conventual buildings, but not the church; and again in 1296-7 they mutilated and plundered the place. We may conclude that the western portion of the cellarge adjoining the Prior's Lodge was destroyed in the burning and rebuilt in the later style about the time of Edward I's second visit in 1307. We find that the groining, shafts, and ribs appear to be new, very probably the Prior's lodge was also burnt and not rebuilt. History has little more to tell; but on examining the building we find traces of King David's visit, and the subsequent repairs. It seems probable that at his visit, most of the buildings with wooden roofs were destroyed by fire, the nave roof, the roof over the south chancel aisle, and the roof of the choir perished in the conflagration; that the central tower was mutilated, and the buildings on the west of the cloister were reduced to ruins, as they bear signs of two or three rebuildings.

The upper portion of the tower was rebuilt in the Perpendicular style and finished in the interior with a flat wooden roof, the interior walls being built with an inclination upwards to receive it. When the monastery came into possession of the Dacres in 1539 the buildings on the west side of the cloister were converted into a dwelling house, as we ascertain from an inscription in the east window of the church, originally in the banqueting hall.\* The alterations were commenced by the first Knight, Sir Thomas Dacre, and carried on by his successor Sir Christopher Dacre; the inserted fireplace in the hall bearing his initials C.D., 1586. The various rooms forming the west front of the cloister were thrown into a large hall and new windows inserted; the fireplaces appear originally to have been on

the west side of the hall and to have been done away with, a large open fireplace being inserted in the centre of the east wall. The north end seems to have been the dais end, and a small chamber beyond still retains portions of the oak panelling and a plaster frieze and cornice, in which at regular intervals are introduced the arms of the Dacres. A small staircase in the thickness of the wall at the south-west corner gives access to the solar above this room, both rooms having small windows looking into the church. The hall would be about 100 ft. long, and only about 18 ft. at its narrowest end. A portion of the decoration can yet be traced. The south end of the hall seems to have had rooms over it, a circular staircase common to it and the tower giving access to the rooms.

The first floor of the Prior's lodge was evidently made into a kitchen and scullery, the fireplaces and brick ovens still remaining; the adjoining room partly under the great hall seems to have been rebuilt, and had later the larger windows with stone benches inserted at the west end; this portion was divided by a wall from the earlier cellarge and was about 12 in. below their level. At the north-west angle of it there is a curious little closet with steps up to the outer court, which probably may have been a porch. A doorway was made from the great hall into what was formerly the refectory, and then probably used as a large dormitory for servants.

The following extract will give some clue as to what became of the fittings of the church after the Dissolution; it is copied from an account of "Belted Will's" chapel in Naworth Castle:—

"The chapel or oratory was situated near the library, at the top of the tower, and contained several interesting remains. It was fitted up with plain wainscot, painted red, and ornamented with esclop shells and cross crosslets, armorial devices of the Dacres and Howards. There were also fragments of what is supposed to have been the rich screen of the rood-loft or part of the reredos of the altar of Lanercost Priory Church, consisting of carved ornaments, of pierced work richly painted and gilt, nailed up on the walls of the apartment. On the altar were several figures in white marble, about a foot in height, sculptured in alto-relievo, and which were of considerable value. They represented the descent of the Holy Spirit, an abess holding a sword, St. George and the Dragon, Judas saluting his Master with a kiss, St. Culbert carrying the head of St. Oswald, &c. It is probable that they were brought from the adjacent monastery of Lanercost at its dissolution. Above the altar was a large painting on wood, 12 ft. in width by 3 ft. 8 in., representing the Passion of Our Lord.\* From this it would appear that the Priory had been fitted up with some splendour.

Some few years ago the nave and buildings on the west side were carefully restored by Mr. Charles J. Ferguson, F.S.A., to whom I am indebted for much of this information and for the use of his plan.

E. RIDSDALE TATE.

#### STALLS: ABERDEEN AND DUNBLANE.

KING'S COLLEGE CHAPEL, ABERDEEN.

THE stalls in the chapel of King's College, as many of our readers are aware, are of exceptional richness and interest, and represent moreover a type of work rather different from what we generally meet with in choir-stall work in Great Britain.

The work dates from the beginning of the sixteenth century, and the tradition is that it was executed for the most part by a French artist—a tradition quite in keeping with what we know in regard to the close social and political connexion formerly existing between France and Scotland, though the carving below the plain panels is very probably by a local man.

Mr. Fulton's drawings show the general elevation and plan of the work, on the large sheet, and one of the smaller plates shows some of the upper panels to a larger scale. The panels are all of different design, and show a great deal of variety combined with a sufficiently uniform effect when the work is considered as a whole. In some of them the details are based on floral forms—thistle, vine,

oak, &c., while the conventional French fleur-de-lis is also introduced.

#### DUNBLANE CATHEDRAL.

The stalls at Dunblane, which, like those at Aberdeen, are carved in oak, and are probably of about the same or of a slightly later date, are not equal in delicacy or in special interest of style to those at King's College, Aberdeen; but they represent the characteristics of Scotch woodwork, and are probably native and not foreign work. The introduction of the centaurs indicates Renaissance influence, the foliage carving is a rather curious mixture of late Gothic and Classic forms, such as one finds elsewhere in Scotch carved work of this period.

The drawings form part of those for which their author, Mr. Jas. B. Fulton, was awarded the Aldwinckle Prize at the Institute of Architects, early in the present year.

#### THE SANITARY INSTITUTE CONGRESS, BIRMINGHAM.

(Continued from page 291.)

As the powers and privileges to make (and necessarily to enforce) by-laws under the Sanitary Acts have not been so fully appreciated as the framers of the Acts must have anticipated, it is a question as to the proper course to be adopted to bring about a better state of things. That it is desirable for all Sanitary Authorities to have proper by-laws affecting new streets and buildings there can be no doubt. However seldom it may be necessary to bring such by-laws into operation they will be of service at some time or other, even in the most sparsely populated districts. If, then, suitable by-laws are essential in rural districts, how much more important that populous towns should possess by-laws framed with the highest possible considerations for health and convenience. This, in the author's opinion, will only be brought about by the adoption of by-laws being made compulsory and a greater latitude being given to Sanitary Authorities to frame by-laws adapted to their own particular districts.

But the possession and value of by-laws will be of little effect if the necessary means are not adopted for enforcing them. Even in districts where there is an apparent desire to see the by-laws strictly carried out, the Surveyor's staff is generally so inadequate that the necessary amount of supervision cannot be given. In the author's opinion no new house should be occupied without a certificate from the Surveyor that it has been erected in accordance with the by-laws, and is fit for human habitation. But it would be manifestly unfair to expect a Surveyor to give such certificate unless he had satisfied himself by systematic and regular supervision on the part of a competent staff during building operations that such certificate was justified. Then again, such a certificate could not be given where the by-laws were not enforced. In some of the older by-laws this certificate is required to be given, but it is not probable that a by-law would now be sanctioned to this effect. Indeed, it would scarcely be desirable until the necessity for a better supervision of new buildings is recognised by Sanitary Authorities.

It appears to the author that many provisions contained in by-laws might with advantage be incorporated in the Sanitary Acts, making them statutory enactments rather than measures to be adopted at the option of Local Authorities. It also seems desirable that by-laws should be made less comprehensive, many matters of detail now included being made the subject of regulations varying according to the requirements of each particular district. Under these conditions a general series of by-laws more acceptable than the present "Model" series could probably be framed, and Sanitary Authorities would be able to include in their regulations many important matters which would make by-laws cumbersome and unnecessarily lengthy. In the case of new streets, for instance, the by-laws might very properly lay down the requirements as to widths under various conditions, but the actual method of construction would be better dealt with in detailed regulations, forming a practical specification of the requirements. Then again, matters connected with the drainage of a building could be more conveniently and in greater detail referred to in regulations. It would add to the value of such regulations to accompany them with a complete set of descriptive drawings.

Many Authorities supplement their by-laws

\* Dr. Todd's MSS.

\* "Lanercost Priory," R. S. Ferguson, M.A., and C. J. Ferguson, F.S.A.



with regulations as to drainage and other matters, but as these are not confirmed by the Local Government Board, and very frequently contain conditions which could not be legally enforced, they cannot be said to be wholly satisfactory.

In any revision of the "Model" by-laws and the Acts under which they are framed, the author is of opinion that the Incorporated Association of Municipal and County Engineers might afford most valuable assistance. Throughout the Sanitary Acts and the "Model" series of by-laws, there are many technical defects which the municipal Surveyor could very readily rectify and thus put an end to much unnecessary litigation. The Local Government Board in 1877 acknowledged the assistance rendered by the Royal Institute of British Architects in framing the by-laws dealing with new streets and buildings, and they would no doubt equally value the help of a professional body whose members must by their every-day experience possess a most intimate knowledge of the subject.

It is to be hoped that the time is not far distant when every Sanitary Authority in the country will be in possession of by-laws which it will be deemed a duty to carry out in the interests of the health of the community.

Mr. Price, Birmingham, proposed a vote of thanks to the reader of the paper, and Mr. Longden, Warrington, seconded. The discussion was continued by Messrs. Eayrs, Birmingham; Calkin, Worcester; Hunt, Dorchester; Reed, Gloucester; and Price, Worcester. In the course of his remarks, Mr. Eayrs said that there were many Local Authorities throughout the country who were afraid to adopt new by-laws because the Local Government Board insisted upon the model by-laws being carried out with very little modification. The Local Authorities thought that some discretionary powers should be left to them.

The vote of thanks having been agreed to, and Mr. Pickering having replied to some of the points raised in the discussion,

Mr. T. J. Moss Flower, of Bristol, read a paper entitled,

**"Precautions to be Observed in the Ventilation of Sewers and Drains."**

In the course of the paper the author said that the object aimed at in ventilating sewers was to prevent, as far as possible, the evolution of gases; to carry harmlessly from the sewers the gases that could not, owing to the physical conditions that existed in sewers, be prevented; to prevent such an abnormal increase in the pressure of the sewer air or gas within the sewer as would make the possibility of the water seal of the traps fixed in connexion with drains discharging into the sewers becoming broken, within reasonable bounds, or cause the sewer air to be forced out at defective or inconvenient points in the sewers or drains, and to purify the air of sewers sufficiently to enable men to work in them. He came from one of the greatest cities in the United Kingdom, where no special means were provided for ventilating the sewers. The objects aimed at in the ventilation of house drains were, to a large extent, the same as in the case of sewers. By properly ventilating the drains the traps connected with the various sanitary fittings were relieved from undue pressure caused by the discharge of water-closets, and other fittings were thus assisted in maintaining their water seal; and should any gases from the public sewer by any means pass to the house drain beyond the disconnecting trap they would be carried harmlessly away instead of remaining stagnant in the house drain to pour, perhaps, into the house through some defect which might at any time occur. Having referred to the injurious effect of sewer air upon health, and considered the bearing of the law on the subject of the ventilation of sewers, the author dealt with the plan most generally adopted in ventilating sewers and drains and some of the precautions to be observed in connexion therewith. The law on the subject was very vague and somewhat difficult of application and required modification. After the model by-laws had been revised, it should be made compulsory for every Local Authority throughout the country to adopt them and to insist upon their being enforced. As to the precautions to be observed in providing for the ventilation of sewers and drains, if success were to be attained, it was useless to consider the question of ventilation apart from the question of the construction and maintain-

ance of the sewers and drains, and the size of the sewer compared with the work it had or might have to do. Sewers should be capable of removing all the foul matter sent into them to its ultimate place of deposit before decomposition set in, and with good falls, plenty of flushing and proper attention, this object could be attained, and unless this could be done, a nuisance must arise from the sewage.

We print the following conclusions from the author's paper: (1) Sewers of deposit should be reconstructed if it is desired to remove complaints. (2) Surface gratings should not be fixed in narrow streets. (3) In fixing shafts up the sides of houses they should be fixed to the tallest buildings; high factories and churches and chapels might well be used for fixing the shafts to, and the gases delivered at a high altitude could not do any harm. The law should allow of Local Authorities fixing sewer-vents to the houses. (4) The shafts to be carried well above the ridge of the roof, and in no case should a pipe be fixed to a house unless at its highest point it could be fixed clear of all doors and windows. This applies to drains. (5) The shafts to be not less than 5 in. or 6 in. in diameter, and to be surmounted with a cowl to prevent down blows. (6) The pipe at foot to be provided with a duck's-foot bend, with well at bottom for the reception of the rust, a cleaning-out hole being provided so that any obstruction could be removed. (7) The dead-end of all sewers to be ventilated by a 6 in. to 9 in. shaft fixed clear of all windows. (8) The sewers cut up in sections, so as to prevent the gases from the lower districts getting to the sewers in the higher part of the town. (9) To see that in the event of open gratings being used, they shall not be placed near the pavement or near the entrance to dwellings. (10) To pay constant attention to the ventilating appliances to see that they are kept in working order.

With regard to drains, it is desirable to see (1) that the drain from end to end is properly ventilated, and not, as in the majority of cases in detached and semi-detached villas, by ventilating the soil pipe, which is usually connected about the centre of the drain longitudinally, and fixing a 4-in. pipe on the inlet side of the disconnecting chamber in front of the house and fixing in front of the 4-in. pipe a piece of freestone with four or five small holes in it, leaving that part of the drain from the foot of the soil-pipe to the back of the house unventilated. (2) To dispense with the use of mica flap-valves, and if a site for a low-level inlet pipe, clear from all doors and windows or places much frequented, could be found, to run the inlet shaft from the drain side of the trap to the ridge of the roof, as it seems simply ridiculous to carefully make all the pipes sound and leave a free opening for the discharge of the drain air in front of the larger or drawing-room window, as is so often found. (3) To arrange the vent-pipes so that the outlets shall not only be clear of the windows, doors and other openings in the house to which the pipe belongs, but also clear of all openings to other houses. This object is seldom kept in view, and much inconvenience and ill-health is believed to be caused by the foul air from neighbours' shafts. The Local Government By-laws bearing on the subject are very vague, and permit inlets at as near the ground level and outlets as low as 10 ft, and where builders and owners are determined to defy Local Authorities there is very considerable difficulty in getting them to carry out the ventilating arrangements in a proper manner. They use for the most part the very cheapest kind of material for ventilating pipes and simply make their joints with a little red lead or something of the sort; the pipes generally are barely carried above the eaves, and every precaution should be taken to prevent this class of work being done. All this could be prevented by the adoption of by-laws specifying in greater detail how the house drains should be ventilated, giving particulars as to the kind of pipe, the joints, &c. (4) To see that in exposed positions at least a cowl to prevent down blows should be fixed at the top of soil pipe ventilators. This the author has found to be absolutely necessary after taking observations over a period of four years in exposed positions. He has found that the water seals in the traps of water-closets become destroyed by the wind blowing down the soil-pipe ventilators with wire globes at their tops. As in the case of sewers the construction of the drainage plays a most important part in the successful ventilation of drains. The drains must have

good falls, be constructed of proper materials, be well flushed. The disconnecting trap should be of self-cleansing nature, although in the absence of special flushing arrangements it cannot be expected that the trap can be properly cleaned with the appliances generally in use.

A paper, entitled "Some Sanitary and Allied Advantages Attending the Introduction and Use of Motor Vehicles," was then read by Mr. E. Shrapnell Smith, who, in conclusion, proposed the following motion:—

"That this Conference of Municipal Engineers assembled in connexion with the Congress of the Sanitary Institute, this 28th day of September, 1898, is of opinion that the introduction and use of efficient motor vehicles should be encouraged by Municipal, Urban, and other authorities, in view of the fact that the extended use of such vehicles would contribute to the general improvement of the sanitary condition of streets and towns, and this meeting recommends the Council of the Sanitary Institute to make known this opinion as widely as possible."

A discussion followed, the following gentlemen taking part therein:—Messrs. Price, Eayrs, Williams, Hooley (Notts.), Phillips (Gloucester), Glover (Warwick), and Mawbey. The motion having been agreed to, a vote of thanks was accorded to the readers of the two papers, and the meeting terminated. In the afternoon visits were made to various public works in course of construction in or near the city.

**Conference of Sanitary Inspectors.**

The Conference of the Sanitary Inspectors was held in the Biology Lecture Theatre, Mason University College. The President (Mr. W. W. West, of Walthamstow), in the course of his address, said that the year 1848, with its Public Health Act, was a landmark in English history, and he proposed to consider the inspector's share in the past and future of sanitation. In the year 1846 the nauseous effluvia emitted from the sewers was of sufficient urgency to engage the attention of the Royal Institute of British Architects, and at one of their meetings in that year Mr. Toynebee opened a discussion thereon, and suggested the use of gas-burners in tall shafts for the purpose of getting rid of the trouble. Still, we had the trouble with us, forming one of the most constant sources of anxiety to those engaged in managing our sewers, and the settlement of which we did not appear to be within sight of. There was no denying that in these and similar directions we had not made the advance that was expected when the first sanitary Acts were passed. Why was this? It appeared to him that there were two reasons which in a self-governing country like ours had paramount influence. First, the people were not sufficiently concerned had not been sufficiently impressed with the seriousness of the need for advancement. Secondly, they had not had the power under the law to see that their wishes in the matter were complied with. It had been acknowledged from the first that those who suffered most from insanitation were the poorest of our people, inasmuch as besides their exposure to the evils which were the result of neglect on the part of owners of property or Local Authorities, they were the victims of their own carelessness and ignorance. In the course of subsequent remarks Mr. West said: "We have then in the future to follow up the work of the past. We have to keep well in advance of the general opinion of our districts. Not to wait to be told what to do, but to point out to others what needs to be done, to lead the way, to explain, to reason, to be missionaries of health. It is said authoritatively that what is required most at the present time is not legislation but education, and there is undoubtedly much truth in that saying. Could we have each individual in the State made to realise his own duty in these matters by personal conviction, doubtless we should be nearly approaching perfection. But we cannot forget that the law is, at any rate at present, a powerful factor in the education of a vast number of people; to know that a certain thing must be done, helps to prove to them that it should be done, and lead them to inquire the reason why; and until every one is actuated by disinterested desire for the general good, until it is no longer possible for any person to make a profit out of the evil conditions which injure others, legislation, drastic and deterrent, will be necessary. . . . The great demand at present, the great need, is air, pure air; much has been done to secure good



drainage, pure food, pure water, but most remains to be done to give the people pure air. The overcrowding of the people is the most crying evil, and that which is, perhaps, the most difficult to deal with. It is exceedingly doubtful if the most zealous efforts of the best equipped Sanitary Authority in great towns can make the slightest real impression upon the amount of overcrowding existing within its borders. The poor people may be driven from room to room, from street to street, or to an adjoining district, but with a greater number of people compelled to live within a certain area than the houses of that area will legally accommodate, overcrowding is inevitable. One inevitable outcome of the desire to improve upon these conditions has been the application to them of the moral axiom, 'there is always room at the top,' by the erection of tenement dwellings of many stories in height. Even where these have been erected under good supervision, it is very doubtful whether we are not hindering the acquirement of the essential condition of life, pure air. It is, however, a first essential in a vast city like London to do our best, first to modify the bad conditions, in default of ability entirely to remove them, and really well designed tenements would undoubtedly help to that end.

A vote of thanks to the President having been agreed to, the following papers were read and discussed: "Canal Boat Inspection," by Mr. W. L. Wilson; "The Training and Education of Sanitary Inspectors," by Mr. E. Worrall; "The Ethics of Sanitary Inspection," by Mr. A. G. Duck; "Overcrowding and its Remedies," by Mr. T. C. Barralet; "The Sanitary Inspector as a Teacher of Sanitation, especially in Rural Districts," by Mr. T. Blundell; and "The Working of the Shop Hours Act in Bristol," by Mr. F. W. Simpson.

Mr. Barralet, in the course of his paper, said it was the overcrowding in dwellings that was fraught with such physical and moral degradation, and the various Public Health Acts had failed to cope with the difficulty. The Public Health Acts were punitive and coercive, not remedial; they gave no definition of overcrowding, and were powerless to deal with the type of overcrowding which might be described as intermittent; they failed also in giving a Sanitary Officer no right to initiate proceedings. At seaside lodgings and boarding-houses it was notorious that overcrowding was rampant, but no seldom heard of proceedings. The "Model" building by-laws, though good in essence, had intensified overcrowding by increasing the cost of building; the author urged that timber-framed cottages should be permitted in the country under restrictions, and that provision should be made to ensure a minimum air space in bedrooms. Public Authorities had not availed themselves to a great extent of the powers to provide dwellings conferred by the Housing of the Working Classes Act of 1890 and cognate Acts. Many of the large towns, however, had attempted to grapple with the overcrowding problem by the erection of dwellings, either in blocks, detached cottages, or lodging-houses, generally with favourable financial results. In rural districts the Act had proved practically abortive through its clumsy and unworkable procedure and the composition of rural governing bodies. All measures aiming at making a working man the nominal owner of the house he lived in by advances from the public funds were to be deprecated as inimical to good sanitation in general, and strongly provocative of overcrowding. Much might be done in mitigation by the encouragement and extension of cheap travel, but it must not be sectional or it would aggravate the evil it was intended to remedy; the zone system as in Austria-Hungary, if adopted by our railways, would cause our cities to grow symmetrically instead of at the least desirable extremities.

During the proceedings the following resolution, moved by Mr. Thomas and seconded by Dr. Brown, was passed: "That the Sanitary Institute be requested to support the petition to the Local Government Board of the Sanitary Inspectors in conference for the appointment of one sanitary inspector at least on the Sanitary Inspectors' Examination Board."

#### The Conference of Ladies.

The conference of ladies was held in the Medical Lecture Theatre, Mason University College. The Lady Mayoress (Mrs. C. G. Beale) presided, and delivered an address. Various papers were read and discussed.

#### Conference of Municipal Representatives.

This conference was held in the Examination Hall of the College, Alderman Cook presiding. The chairman dealt in his address with the sanitary progress of Birmingham. The following papers amongst others were also read and discussed: "Dwellings of the Poor," by Dr. J. F. J. Sykes; "Removal of Insanitary Areas and Management of Improvement Schemes under the Housing of the Working Classes Act," by Mr. P. Addie; "Municipal Authorities and Public Slaughter Houses," by Mr. E. Parkes, M.P.; "Village Sewerage Schemes: Experiments in the Rural District of Brixworth," by the Rev. Dr. Cox; "Sewage Disposal and Official Hindrance," by Alderman S. Compston; and "The Chemical Measurement of Ventilation," by Professor F. Clowes.

#### Conference of Medical Officers of Health.

This conference was held in the Chemistry Lecture Theatre of the college, and was opened by an address by the President, Dr. J. C. McVail. Some other papers were: "The necessity for the amendment of Part I. of the Housing of the Working Classes Act, 1890," by Dr. H. Scurfield; "Sanitary Service in Rural Districts in Ireland," by Dr. J. H. Fergusson, and "Hospital Reform from a Sanitary Point of View," by Mr. T. Garrett Horder. During the proceedings the following motion was proposed and adopted:—

"That owing to the unsatisfactory condition of the sanitary administration in the rural districts in Ireland from the want of independent supervision, the Government be urgently requested to remedy that defect by introducing a Bill early next session requiring the new County Councils to appoint a Medical Officer of Health for each county with the same tenure of office as the present County Surveyors. That the Council of the Sanitary Institute be requested to approach the Government on the subject."

In the evening, the Lord Mayor and Lady Mayoress held a reception at the Council House.

The work of the three sections commenced on Thursday. Our report will be concluded next week.

## Correspondence.

### To the Editor of THE BUILDER.

#### ST. SAVIOUR'S, SOUTHWARK.

SIR,—In your note in the *Builder* you say that in my handbook to "The History and Antiquities" of the above church the name of the architect of the new nave is altogether omitted. That statement is not strictly accurate. Indeed, I think I have mentioned almost everybody and everything connected with my subject, as far as my limited space would allow. I mentioned the name of the builder; I mentioned your own excellent journal; and when I turned to my book I was glad to find that I had not failed to insert the name of our architect (and that conspicuously, as he has a whole line to himself) in a long list of those who have helped to make St. Saviour's what it is in modern times. Do me the favour to read to the cover.

W. THOMPSON, D.D.

\* \* \* That is to say, that inside the back of the cover (not in the book) there is a formal list of the names of the Restoration Committee, with the architect's name at the foot. We had not seen that, but we do not think it is any answer to our criticism. The book is quite silent about the architect's name where the nave is mentioned and illustrated, nor does Sir Arthur Blomfield's name appear in the index. We observe also that on page 59 the new lectern is mentioned with great approval; this also was the design of the architect, but no mention is made of his name. The name of the lady who paid for it is given; that is the important point, of course; no matter who designed it.—E.H.

#### NEWARK PRIORY.

SIR,—With reference to the letter from Mr. W. Hilton Nash on the above, in your issue of the 24th inst., I have known Newark Priory for some time, and the coffin lid he mentions was visible on the occasion of my first visit, which I see from my sketch-book was in April, 1895. The stone in question marks the position of a building which was probably the gate-house, or one of the other outer offices of the Priory.

I have measured the plan of the remains as far as they can be traced, and the arrangement is distinctly peculiar in one or two respects. You will perhaps allow me to point out some of these peculiarities.

The canons' choir is separated from the transepts by solid walls of sufficient height to allow of the

stalls being placed against them, the transepts being spanned in each case by two arches instead of one, the central piers rising from the tops of the above-mentioned walls with buttresses at the backs (that is, in the transepts).

Another point in the plan is the fact that the cross arch at the western end of the choir is placed one bay west of the crossing instead of carrying through the west walls of the transepts, thus subordinating architectural methods to the monastic arrangements.

East of the transepts and on either side of the presbytery is an aisle extending along two bays only out of the three which complete the presbytery. These aisles were open to the transepts, but were approached from the presbytery by the small processional doors only, which are directly east of the transepts, the next bay being entirely shut off, though on the north side are traces of a tomb going right through the thickness of the wall. Also east of the transepts, and opening respectively from the northern and southern bays, are two small chapels, but for some reason which is not quite apparent, the walls of the aisles were not utilised for these, but separate ones built, leaving a space of about two feet only between the two.

The slype is still traceable on the south side, as also is the Doric night door high up in the south gable. The only trace of the nave is a fragment of the south aisle wall.

I have in my possession an old print dated 1761, which shows the buildings much as they are now, with the exception of the yawning crack which, as Mr. Nash truly says, is endangering the safety of the south gable.

F. FORBES GLENNIE.

### ARCHITECTURAL LECTURES AT UNIVERSITY COLLEGE.

SIR,—I should be glad if you would permit me to make it known to your readers that the committee of management of this college have reduced the fees in the classes of architecture and construction so as to bring them within the reach of students obtaining County Council Scholarships—or others of equal value.

For five guineas a student can now attend a course of forty lectures in either art or construction and also the evening drawing class in the same subject.

P. ROGER SMITH.

P.S.—The subject of my public opening lecture on Monday, October 10, at 7.30 p.m. is "Students' Difficulties."

## The Student's Column.

### SOUND, LIGHT, AND HEAT.—XIV.

SOUND: REFLECTION (continued).

THE "whispering gallery" in St. Paul's Cathedral has frequently been quoted as one of the most peculiar effects of the reflection of sound, and has been investigated by many physicists. But authorities are by no means agreed as to the cause of the phenomenon. Atkinson\* remarks that whispering galleries are formed of smooth walls having a continuous curved form. The mouth of the speaker is presented at one point and the ear of the hearer at another and distant point. In this case the sound is successively reflected from one point to the other until it reaches the ear. He believes that in this way, in reference to St. Paul's, the faintest sound is conveyed from one side of the dome to the other. It is not heard at any intermediate points. Tyndall also thought the phenomenon was due to an echo, or repetition, whilst other observers attributed it to reflection from the surface of the dome overhead. Lord Rayleigh, however, says the sound "seems to creep round the gallery horizontally." Professor Roger Smith† observes that some whispering galleries depend upon the conduction of sound along a very smooth surface, and others upon its reflection; but, in either case, the surprising loudness with which a whisper uttered at the proper place is heard at some other spot, is due to the coincidence at the hearing point of several rays of sound reaching it at the same time by different paths. Thus, at St. Paul's the sound reaches the point where it becomes audible by two different paths of equal length, so that a double effect is produced on the hearer. This, says the last-mentioned author, is an instance of conduction along the walls.

It is unprofitable to pursue this controversy further; enough has been said to show the student what little has been done towards assimilating a most elementary problem in

\* Ganot's "Physics," 1893, p. 219.

† "Acoustics in Relation to Architecture and Building," 1895, p. 150.



physics in the elucidation of certain peculiarities met with in construction. The laboratory-theatre lecturer has not yet been able to meet the practical constructor on his own ground—and *vice versa*. In our opinion "Ganot" has the best of the controversy, so far.

To our mind, one of the most interesting practical applications of the theory of sound, was the organ-metal reflector erected by Mr. Penrose in St. Paul's to minimise the echo which proceeded from the dome. As most people are aware, a permanent pulpit was erected in the cathedral, and a number of seats were placed in the central part of the church immediately under the dome. It was soon found that the echo from the dome was disagreeable to both preacher and hearers. So, the reflector alluded to was erected in a horizontal position over the pulpit. This metal reflector, the section of which was hyperbolic, and 10 ft. in diameter, was arranged with the *convex* side turned downwards.

The object, of course, was to prevent the sound from reaching the ceiling of the dome in its entirety, for if the sound could be broken up satisfactorily, the curved surfaces of the ceiling could not reflect the sound *en bloc*, but could so arrange the reflection that before it could re-reach the floor of the cathedral it was not only much lessened in intensity but the echo was practically lost. The reflector cut off a great portion of the sound which was thrown laterally over the congregation, *i.e.*, in the direction where it was most wanted. With reference to this reflector, Mr. Penrose observed that at a small elevation above the floor, the preacher was not nearly so well heard as he was by persons standing at the same distance and amongst the crowd, notwithstanding the advantage of an undisturbed and direct line of communication above the heads of the congregation. This is certainly a case in favour of a flat curve, as against the older form of parabolic reflector. At the same time, such a reflector is not of universal applicability, and each case must be judged on its merits, depending on the actual form and construction of the interior of the building.

Regarding the phenomena of "whispering galleries" as an exemplification of multiple echoes it is not difficult to apply the principle to other structures. Some echoes repeat the sound twenty or even thirty times; at Woodstock there is one which repeats from seven to twenty syllables. Atkinson speaks of a square room with an elliptical ceiling on the ground floor of the Conservatoire des Arts et Métiers, in Paris, as an illustration of acoustic foci.

As the laws of the reflection of sound are practically the same as those of light and heat, curved surfaces produce acoustic foci like the luminous and calorific foci produced by concave reflectors. He observes that if a person standing under the arch of a bridge speaks with his face turned towards one of the piers the sound is reproduced near the other pier with such distinctness that a conversation can be kept up in a low tone, which is not heard by any one standing in the intermediate spaces. The square room in the Paris Conservatoire alluded to is said to present this phenomenon in a remarkable degree to persons standing in the two foci of the ellipse.

Sound is reflected not merely by solid surfaces, but even by clouds, and a well-known experiment shows that sound, in passing from a gas of one density into another, is reflected at the line of junction between the two, though, of course, the reflection is only very partial, and depends on the extremes of density existing between the two gases. Thus, in the case of the density of both being nearly the same, the reflection would not be so complete as though the one gas through which the sound first passed was of extreme tenuity and of very low density, whilst the other with which it was in contact was of high density.

Tyndall has shown that a medium of alternate layers of light and heavy gases, such as coal gas and carbonic acid, deadens sound, and also that a medium consisting of alternate strata of heated and ordinary air exerts a similar influence. In another connexion Atkinson observes that so long as the continuity of air is preserved, sound has great power of passing through the interstices of solids. Thus it will pass through twelve folds of a dry silk handkerchief, but is stopped by a single layer if the handkerchief be wetted.

Perhaps the most concise account of the acoustic properties of public buildings, both British and foreign, written in recent years,

is that by Mr. H. W. Burrows,\* to which we must refer the student for much information on that head. Mr. W. Fletcher Barrett,† in reference to proportion and dimensions of buildings to ensure good acoustic results, states that it appears that for good acoustic properties a building should be so constructed that its different dimensions shall be in some simple relationship to each other. An analogous effect is well known in music, for if two notes have the simplest possible relationship to each other's rate of vibration, as 1 to 2, or an octave, the combination of those two notes is more harmonious than any other combination. Next to this would be the ratio of 2 to 3, or the fifth, and next the ratio of 3 to 4, or the interval of a fourth, and Mr. Barrett carries the illustration much farther.

Some years ago Mr. Heathcote Slatham read a suggestive paper at the Institutet in reference to the construction and acoustic properties of buildings designed for the performance of music. He observed that it is probable that for the largest class of musical performances, the execution of great works of combined choral and instrumental effect, neither the amphitheatrical nor the theatrical form will be found the most suitable. The form of the complete amphitheatre, though its symmetry and simplicity may seem to recommend it, has this serious disadvantage (when used on a large scale) that the sound, as produced in the orchestra, is not properly controlled and confined in the direction in which it is most wanted. A certain proportion must be observed between height and width, and the wide area of an elliptic amphitheatre requires a lofty roof, with consequently a great space for the production of echo; a space into which the sound is launched with nothing to confine it in the direction of the audience, so that a considerable portion flies off to the roof, and so is wasted, or it is reflected back again and becomes a source of serious disturbance. Something approaching the theatre form is better. The same author referring to materials states that the orchestra should be constructed principally of wood; and the walls of the auditorium lined with wood; but the walls as well as the ceiling require to have their otherwise flat surfaces broken up at intervals by projections to avoid conduction of sound along the walls, and to break up reflection from the ceiling. As to floors, he observes that a room with a flat floor is always unsatisfactory for hearing, and the seats should always rise as they recede from the orchestra; he adopts the principle of Scott Russell's isocoustic curve.

On another occasion Mr. Slatham§ claimed that a flat, or nearly flat, ceiling is the best form for a large music hall. It breaks up and assists in destroying echo, whilst a semicircular vault collects and focusses it. Mr. Burrows|| in summarising this aspect of the question, remarks that some authors insist upon a curved form for the ceiling; but the nature of the curve is the difficulty. If it be parabolic or semicircular, we have the danger of foci being formed by the reflected sound rays; and it is probably due to this consideration that some urge that the curve should be in the shape of a coach roof. All appear to be in agreement that it is bad to have right-angle junctions between walls and ceiling, as confusing reflections ensue, and, to obviate this, some form of cove has been usually adopted.

#### BOOKS RECEIVED.

A POCKET DICTIONARY OF HYGIENE. B. C. T. Kingzett, F.I.C., and D. Homfray, B.Sc. (Baillière, Tindal, & Cox.)

DER BACKSTEIN ROMANISCHER ZEIT, BESONDERES IN ORIENTALISCH UND NORDDEUTSCHLAND. Von O. Stiehl. (Baumgartner's Buchhandlung, Leipzig.)

BUILDING CONSTRUCTION AND DRAWING. By George A. Mitchell. Elementary Course. (B. T. Batsford.)

BUILDING CONSTRUCTION AND DRAWING. By George A. Mitchell. Advanced and Honours Courses. (B. T. Batsford.)

PUMPS: THEIR PRINCIPLES AND CONSTRUCTION. By J. Wright Clarke. (B. T. Batsford.)

AERIAL OR WIRE-ROPE TRAMWAYS. By A. J. Wallis Taylor, C.E. (Crosby Lockwood & Son.)

\* R.I.B.A. Journal, vol. II., 3rd Ser., 1895, pp. 355, et seq.

† The Builder, 1869, p. 404.

‡ R.I.B.A. Transactions, 1873, pp. 71, et seq.

§ The Builder, 1871, p. 543.

|| Op. cit., p. 359.

#### GENERAL BUILDING NEWS.

ADDITIONS TO TADCASTER CHURCH.—The Church of St. Mary at Tadcaster has been enlarged from end to end to give extraaccommodation and more vestry room, and a new hot-water heating system has been introduced; the whole work cost 1,224*l*. Messrs. Thompson, of Sherbourne, were the general contractors, the plumbing work being by Mr. Tindal, of Tadcaster, and Mr. G. W. Milburn, of York, executed the carving. The architects are Messrs. Brocket & Thorman, of Tadcaster. The illustration of the new choir doors is given on another page.

SCHOOLS, NAPPAN, CORNWALL.—New schools at Nappan have just been completed. The main schoolroom is 40 ft. by 18 ft., and separated from it by movable partitions, are boys' and girls' classrooms, each 20 ft. by 18 ft. There are also an infants' schoolroom, 26 ft. by 22 ft., and cloak-rooms for boys and girls. The buildings are of St. Stephen's granite. The floors of the school and class-rooms have been laid with wood blocks, and the corridors have tiled floors and dados, the cloak rooms being finished in cement. The building was designed by Mr. Sampson Hill, of Redruth, Architect to the School Board; and the work was carried out by Mr. F. G. Gilbert, of Trellon, mason, and Mr. T. F. Richards, of St. Stephen's, carpenter.

NEW THEATRE, ST. PANCRAS.—The Vestry of St. Pancras has approved plans for the erection of a theatre on the north side of Crowndale-road, Camden Town.

PRESBYTERIAN CHURCH, BENWELL.—On September 21 the Presbyterian church erected at Benwell was opened. It is capable of seating between 400 and 500 people, and has class-rooms, kitchen, and caretaker's house. The builder was Mr. T. Hunter, of Washington, Co. Durham; and the architects, Messrs. Badenoch & Bruce, of Pilgrim-street, Newcastle-on-Tyne.

REBUILDING, METROPOLITAN TABERNACLE.—In rebuilding this church it has been decided to retain the portion of the walls left by the fire. The construction will, as far as is possible, be fireproof, much of the material that was previously wood being replaced by iron. The auditorium will be of the same width as before, but the length will be reduced to the extent of one bay, which is equal to about 13 ft. 6 in. This reduced length, while it enables the pastors to get nearer to the audience, and, as the committee believe, improves the proportions of the building, also gives opportunity to add to the number and size of the vestries, and to provide commodious baptising rooms. The committee have not found it either necessary or advisable to omit the upper gallery. The total seating capacity will be reduced by about 1,000. The heating will be by means of radiators. There will be electric light throughout, with reserve gas supply in the roof and at the entrances, in case of accident. The seats will be more commodious than in the old building, and the aisles will be wider. The exits will be improved, and the committee are negotiating for the hire of a narrow strip of land at the north side of the tabernacle in order to widen the outside passage. The working drawings for the whole of the structure have now been prepared. Messrs. Searle & Hayes, of Ludgate-hill, are the architects.

SCHOOL BUILDINGS, ADMIRALTON.—These school buildings which have recently been opened consist of a central hall, 45 ft. by 25 ft.; two class-rooms, 20 ft. 16 ft.; master's and mistress's rooms; workshop, 20 ft. by 15 ft.; laboratory, 20 ft. by 15 ft.; music-room, 18 ft. by 15 ft.; kitchen, 26 ft. by 16 ft.; two laboratories, and out offices. The architect was Mr. L. L. Banks Price, of Lampeter; and the contractor, Mr. E. Evans, of Llanybydder.

HOTEL, CULTER, ABERDEENSHIRE.—A hotel is to be erected in the rising suburban district of Culter from plans by Mr. R. G. Wilson, architect, Aberdeen. At the same place a residence costing in all about 7,000*l*, is to be put up for a gentleman according to designs by Messrs. Beattie & Macdonald, architects and civil engineers, Aberdeen.

NEW THEATRE, LEEDS.—The new Queen's Theatre, which is being erected in Leeds, is rapidly approaching completion. It is situated at the corner of Meadow-road and Jack-lane. All the entrances to the various parts of the auditorium are situated under a series of iron girders forming a part of the building, each leading to the hall containing the pay-office, which will have separate windows for stalls and boxes, circles, pit, and gallery. The auditorium will be capable of holding 4,000 people. The dimensions are as follows:—From curtain to back wall of pit, 72 ft.; width of auditorium, 78 ft.; stage, from curtain to back wall of stage, 47 ft. Four exits are provided from the pit, three from the gallery, and two from the dress circle. The builder is Mr. F. S. Davidson, of Newcastle-on-Tyne; and Messrs. W. Hope & J. C. Maxwell, of Newcastle-on-Tyne, are the architects.

ALTERATIONS, DRAPERS' HALL, THROGMORTON-STREET.—The City Press states that considerable progress has now been made with the alterations being carried out at Drapers' Hall, in Throgmorton-street, and the work in the interior of the building is being pushed on rapidly. The chief entrance in Throgmorton-avenue is new. The western portion of the hall has been completely transformed, folding doors having been fitted into the old apertures, and the floor laid in black and



white marble. The building at the top of the new staircase has been extended a distance of 10 ft. towards the avenue, space being thus obtained for a portion of the staircase. The balustrade is of Emperor's red marble, while the panelling is set in a casing of alabaster. The bases of the columns supporting the staircase are of Parian marble. Above are the arms of the Company, ornamented. The upper portion of the wall is lined with marble, in front of which rise numerous columns. Shined glass windows will shortly take the place of those temporarily fitted in the extension. Electric light has been fitted throughout the building, and a new back entrance has been made in Austin-friars. The marble work and carving are being done by Messrs. Farmer & Brindley, of Westminster Bridge-road, and the builders are Messrs. Colls & Son, of 5, Coleman-street.

**COUNTRY SCHOOL BUILDINGS, CARDIGAN.**—The buildings erected for the Joint County School were recently opened by the Mayor of Cardigan. The new school abuts on the main road leading to Gwbert-on-the-Sea. The site is two acres in extent, enabling the managers to provide playgrounds and covered rooms for exercise. The building is constructed of brick, with Bath stone dressings. It contains a spacious assembly hall, class-rooms, lecture-room, laboratory, cookery-room, laundry, workshop, lavatories, &c. The estimated cost of the buildings, irrespective of the site, is 3,500l. The architects were Messrs. Morgan & Son, Carmarthen, and the contractors Messrs. J. Williams & Son, Felingtonullo.

**BAPTIST CHAPEL, ROOKSBIDGE, SOMERSET.**—On September 22, a Baptist chapel erected at Rooksbridge was opened. Seating accommodation has been provided for about 250 persons. The roof and wainscoting are of match-boarding, the former being surmounted by an anaglypta border. Beneath the platform, at the north end, is a baptistry, lined with white tiles. The lighting was carried out by Messrs. Bryant & Sons, of Weston-super-Mare, acetylene gas being utilised, and the chapel and schoolroom, which are connected by a doorway, are heated by low pressure hot-water pipes, the work being done by the same firm. The exterior of the chapel is composed of brick, with Bath stone dressings. Mr. T. C. Stephens was the builder, and the architect was Mr. T. Archibald Cox, of Bourne-mouth.

**ST. STEPHEN'S CHURCH, NORTH BOW.**—This church was reopened on Sunday last having been thoroughly repaired at the cost of 1,000l. The brickwork has been repaired, new stone has replaced the old where defective, and the whole of the roofs have been renovated. Two large dormer windows have been added at the apex of the nave roof for light and ventilation. The interior of the church, which was of the most gloomy character, has been decorated throughout and presents a more cheerful appearance. On the walls of the chancel on either side of the large east window, which is now partly filled with painted glass, are groups of angels bearing scrolls, from cartoons by Mr. G. Moore Macdowell, the general decorations being executed by Messrs. Heaton, Butler, & Bayne. The nave seats have been widened, and the doors have been removed. The pulpit, which was in the middle of the chancel stalls, is now placed in the nave. The stalls and floor of the chancel, which were on a level with the nave, have been raised, and a tile pavement has been laid by Messrs. Godwin & Sons, of Loughwardine, Hereford. At the back of the stalls carved oak screens now define the chancel, and these have been executed by Mr. J. T. Wilson, of Hampstead-road. The work has been carried out under the direction of Mr. John Mealand, architect, the builder being Mr. Martin D. Wills, of Clapham Junction.

**COTTAGE HOMES, GATESHEAD.**—On September 28 the foundation stone of the Cottage Homes for Children which the Gateshead Guardians are building at Shotley Bridge was laid. The homes are each planned for fifteen children. The bedrooms have accommodation for seven children each, and a spare single bedroom intended for those about to leave the home. The six ordinary homes contain, on the ground floor, hall, staircase, play or day-room, kitchen, scullery, larder, stores, bath-room, and lavatory, and foster-mothers' sitting-room. On the upper floor are the children's bedrooms, mothers' bedroom, spare single bedroom, and linen closets. The administrative building contains, on the ground floor, kitchen, scullery, and two sitting-rooms, also board-room, general store, two offices, surgery, and lavatory. Over the central portion of this building are the bedrooms, bath and store-rooms for the use of the superintendent. Behind the administrative building are the workshops, containing carpenter's, smith's, shoemaker's, and tailor's shops; with stable, implement and cart sheds, and other necessary store-rooms. The general store and out-offices are placed in the central part at the rear of each block. The cost is estimated at 15,000l., including making roads, sewerage, &c. The builder is Mr. Wm. Campbell Tyrie. The architect is Mr. Wm. Lister Newcombe, Newcastle-upon-Tyne.

**ST. MARY'S CHURCH, BOLSOVER, DERBYSHIRE.**—This church, it may be remembered, was almost entirely destroyed by fire on January 24, 1897. The only remaining portions of the old building are the thirteenth-century tower and spire, portions of the outside walls of the fourteenth-century chancel, the

Cavendish chapel, erected A.D. 1618, and the north porch and parts of the outside walls of the north aisle and transept (the latter used as a vestry), which were built about twenty years ago. The former church provided seats for about 500 adults, and it was desired to increase the accommodation as much as possible, retaining the portions of the old building which were not destroyed by fire, and without adding to the length of the church. This has been done by extending the south aisle laterally, about 100 additional seats being thus obtained, the north and south aisles now being of almost equal width, instead of the north aisle being about twice the width of the south aisle, as it was before the fire. The nave has been made 3 ft. 6 in. wider than the one destroyed, thus being restored to the central axis between the western tower and the chancel, as the original thirteenth century nave evidently was. A triple arrangement of roofs over the nave and aisles has been adopted, the nave arcades being carried on octagonal pillars with capitals, as before. Most of the remaining portions of the building having been of the fourteenth century period or style, it has been considered best to build the new portions in the same style, in order to produce, as far as possible, a harmonious whole. The external walls are of Bolsover Moor stone, with Weldon stone for the window tracery, &c. Ancaster stone throughout has been used for the interior, the walls, which were formerly plastered, being now lined with stone, those of the tower having been repaired and pointed only. The woodwork of the roofs is chiefly pitch-pine, the whole stained palm-green. The roofs are covered with Buttermere green slates. The new roof of the Cavendish Chapel is of oak, with carved beams and pendants, &c., and enriched plaster panels in the Jacobean style, and covered with lead. The floors under the seats are of wood blocks. The passages are paved with "terrazzo" and cube marble mosaic. The chancel floor is of marble mosaic, with Devonshire marble steps. The slab tombstones found in various parts of the church have been relaid in the floors of the transept (vestry) and under the tower. Several ancient stone coffin lids with incised crosses have also been discovered, and have been fixed round the base of the tower walls inside. An old piece of carving representing the Nativity (probably part of a fourteenth-century altar piece) has also been preserved and fixed to the wall inside the porch. The new carving has been modelled on that in the Chapter House at Southwell Minster. The doors, seats, choir stalls, &c., are of oak. The font was formerly in Chesterfield parish church, and has been presented to Bolsover Church by the Vicar of Chesterfield. The pulpit, designed by the architect, has been given by Major Hallows. The total cost of the rebuilding and restoration, with such fittings and furniture as are at present provided, is about 9,000l. Another 1,000l. will be required to complete the work. Messrs. Bowman & Sons, Stamford, are the contractors. The heating has been carried out by Mr. James Gray, Chelsea, by hot water, on the low-pressure system. Messrs. John Taylor & Co., Loughborough, have re-cast and re-hung the bells, with cast-iron framing. The mosaic floors have been executed by Messrs. Mainzer & Co., Berners-street, London; and the wood-block floors by Messrs. Charteris & Longley, London. Mr. George Wragge, Salford, Manchester, has made the gas-fittings, of wrought iron and brass. The fireproof steel door of the Cavendish chapel was made by Messrs. Chubb & Sons, London. Messrs. Jones & Willis, London, have supplied the ornamental wrought-iron door hinges and furniture. Mr. C. Lowe, Sheffield, is the organ-builder. The organ-case is being made by Messrs. Bowman & Sons, from the architect's designs. Messrs. Smith & Co., Derby, have provided the new clock. The stone carving has been executed by Messrs. Tuttle & Son, Lincoln. The architect is Mr. Louis Ambler, London, and Mr. J. C. Walker acted as the clerk of works.

**ROMAN CATHOLIC CHURCH, BIRKENHEAD.**—The church which is to be built for the Higher Tramway, Devonshire Park, &c., residents, is to be proceeded with at once. The plans have been approved by the Bishop of Shrewsbury. The church will probably cost about 5,600l., and sitting accommodation will be provided for 600 persons. Mr. Kirby, of Liverpool, is the architect.

**SCHOOL, WEST BRIDGFORD, NOTTINGHAM.**—A memorial stone was recently laid at the Sunday school buildings now being erected in connexion with the Congregational church, on the corner of Musters-road, West Bridgford. The building is to be of red brick, with stone dressings. In the front gable there is to be a large five-light tracery window, flanked on either side by massive buttresses. There will be four entrances, with lobbies. Two will be approached from Musters-road, and two from Millicent-road. When the contemplated church is built there will be an additional entrance, with large lobby, connecting the church with the schools. The buildings will comprise:—A school-room, 56 ft. long by 25 ft. wide, accommodating about 250 adults or 300 children; nine class-rooms, accommodating 15 to 20 children; one young men's room, accommodating 24; one infants' room (temporary), accommodating 30 children; one ladies' room, accommodating 24; a superintendent's room and library; kitchen and heating chamber. The class-rooms will be arranged

on the sides of the large room, with glass folding partitions, so that the class-rooms may be thrown into the school-room when used for concerts or on other special occasions. Advantage of the necessarily deep foundations has been taken to provide for a large store-room and heating chamber under the schools. The superintendent's room, library, young men's room, and ladies' room will have entrances from the lobbies without going into the school-room. The roof of the school-room will be of open timber work, with flat eaves and principals. The whole of the windows will be glazed with cathedral glass, and a portion of each window will be made to open, for ventilation. The contract for the building is 2,200l. The builder is Mr. W. Maule, and the architects are Messrs. R. C. & E. R. Sutton, of Nottingham.

**POLICE STATION, HUDDERSFIELD.**—A new borough police-station erected in Huddersfield, was opened recently. It is contiguous with the fire station, and the buildings cover a site about 990 square yards in area. They are bounded on one side by Back Ramsden-street, on the other by Princess-street; the main front, containing the principal entrance, being in Peel-street. The police entrance and private entrance are from Princess-street, and the prisoners' entrance is in Back Ramsden-street, while a subterranean passage connects the building with the court-room in the Town Hall, thus providing for the conveyance of prisoners from the court to the cells with complete obscurity from the public. The buildings are in the Renaissance style, and being very low in comparison with the adjacent Town Hall and School Board offices, they contrast with the more massive character of these erections. With the exception of the cell wing, which faces Back Ramsden-street, the building comprises two storeys only, the lower being for the most part a semi-basement. On this floor are placed the women's cells, seven in number, with the charge office conveniently near the entrance; the constables' parade-room, tailors' workroom, strong-room, and various stores for documents, stolen property, &c. On this floor also, and having separate entrances from Back Ramsden-street, are the mortuary and post-mortem room and washhouse, whilst occupying the Princess-street angle are the caretaker's house and office. Beneath the women's cells, the floors of which are of concrete, are placed the heating apparatus and stores for fuel, &c., and over these cells, and approached by an inclined way in lieu of staircase, are the male prisoners' cells, two of the nine provided being for sick, and inebriated prisoners, respectively, and isolated from the remainder by a short corridor. One of the female prisoners' cells below is also intended for sick cases, and somewhat modified accordingly in point of size and in other respects, such as the provision of a fireplace. Extending over the male prisoners' cells is a spacious general parade-room. On the upper ground floor are the offices for the Chief Constable, chief detective, and their staffs; also superintendent's office, warrant office, men's day-room, solicitors' room (for interviewing prisoners, &c.), as well as public inquiry offices, telephone exchange, and lavatory accommodation for the various departments. Above these offices a parade ground is provided, covering an area of about 200 superficial yards. The contractors were:—Mason, Mr. Alf. Schofield; joiner, Mr. Henry Holland; plumber, Mr. Thomas Armitage; plasterer, Mr. W. E. Jowitt; slater, Mr. T. B. Tunnicliffe; heating, Mr. F. Milne; concrete, Mr. John Cooke; painters, Messrs. W. & P. Holroyd; ironwork, Messrs. Dorman, Long, & Co., Middlesbrough; ironwork (sub-contractors), Messrs. Heaps & Co., Huddersfield; carver, Messrs. Thewlis & Co., Leeds; electrician, Mr. E. Liveridge. Mr. Hartley Sutcliffe was clerk of the works. The buildings were designed by the former Borough Surveyor, Mr. R. S. Dugdale.

**MUNICIPAL BUILDINGS, GOVAN.**—The foundation stone of the Public Halls and Municipal Buildings, Govan, was recently laid. The council chamber will be situated on the ground floor, in the centre of the building. It will have a public gallery with a separate entrance. The burgh officers' rooms will be placed at the entrance to the main hall. The public hall will accommodate 2,000 persons; it is to be oblong, with two aisles, and will have galleries on three sides, with a commodious platform at the upper end, behind which is to be reserved a space for an organ. Round the hall on three sides will be passages providing access to reserved seats and platform, the hall having nine exits to the passages, and the passages six exits to the street. On each side of the principal entrance will be stairs leading to the upper floors. On the first floor are to be accommodated the staffs of the Burgh Surveyor, Cleansing Inspector, and Sanitary Inspector; and here also there is to be a small public hall with seating for 50 persons, having a separate entrance from Summerford-road. On the second floor will be placed the janitor's house, with bunkers and storage rooms, and in the basement a large kitchen, communicating with the two halls by lifts; there are also two heating chambers, strong room for burgh documents, and a fire and draught-proof room for the use of the Inspector of Weights and Measures. The architects are estimated to cost 32,000l. The architects are Messrs. Thomson & Sandilands, of West George-street, Glasgow.



## SANITARY AND ENGINEERING NEWS.

**MAIDSTONE WATERWORKS.**—The Maidstone Town Council has decided to promote a Bill in the next Session of Parliament, for the compulsory acquisition of the Waterworks Company, and the extension of the present sources of supply. It is stated that the undertaking will cost the town about 120,000l.

**ELECTRIC LIGHT INSTALLATION, ST. NICHOLAS' CATHEDRAL, NEWCASTLE-ON-TYNE.**—This cathedral, in which the electric light is being installed, was re-opened on September 25. Twenty-three coronas are being suspended from the roof of the side aisles by Messrs. Walker & Coxon, of Newcastle. The general installation is being fixed by Messrs. Rowland Barnett & Co., Limited, of the same city.

**EXTENSION OF GASWORKS, ROTHERHAM.**—The first part of the considerable additions to Rotherham Corporation Gas Works has recently been completed. It consists of a retort house and plant, including improvements for the automatic handling of coal and for the economical consumption of coke in the furnaces where the coal is handled for carbonising processes. Upon the coal being tipped up in the shed, it is passed through a crusher, which crushes it into suitable size, after which the coal is lifted by buckets upon an endless chain worked by a gas engine. From the elevator, which is 60 ft. high, the coal is conveyed to the bunkers, each of which is capable of holding about 40 tons, and from thence dropped through shoots into the retorts. It is conveyed to the retort without being touched by hand in any way, the retorts being set at an angle of 32 degrees. The cost of the works as at present completed is about 14,000l. The contractors are Messrs. Chadwick & Co., Rotherham, and for the ironwork and retort setting Messrs. R. and J. Dempster, Manchester. Mr. G. Winstanley, of Coventry, is the consulting engineer, and Mr. F. A. Winstanley the resident engineer of the gasworks.

**SEA WALL, HERNE BAY.**—The reconstruction of the sea wall and promenade at Herne Bay, which were so extensively damaged in the destructive gales of last November, is to be proceeded with at once, the estimated cost being placed by Mr. Baldwin Latham at 40,000l.

**WATER SUPPLY, CHARD, SOMERSET.**—A Local Government Board inquiry was held at Chard on September 21 relative to an application by the Town Council to borrow the sum of 2,500l. for works of water supply. It was stated that the Council contemplated laying a new service of water mains in place of the existing mains, which are old and defective. The present water supply is derived from springs just above the centre of the town, and the yards situate above the level of the springs are without any town supply. Opposition was offered to the scheme by residents outside the area of the town supply on the ground that it would be unfair to charge them a share of the cost of laying pipes from which they would derive no benefit and it was urged that the Town Council should carry out a proper scheme of water supply for the whole borough. Mr. G. Hodson, C.E., of Loughborough, attended the inquiry, and in very strong terms condemned the present springs from which the town water supply was derived. He declared that he would refuse to be associated with any scheme which contemplated the continued use of water from this source, which he found was liable to contamination at any time.

**WATERWORKS EXTENSION, BRISTOL.**—The erection of the pumping station at Blagdon, Somerset, for the Bristol Waterworks Company is about to be commenced. This work is in connexion with the operations commenced in 1891, of impounding the waters of the Yeo and formation of a reservoir from which the water will be pumped to the present reservoir near Bristol. The reservoir, when completed, will have a capacity of two thousand million gallons. The water will cover a large area about one and three-quarters miles in length, and will be some parts 40 ft. deep. The pumping station will consist of two large engine-houses with two engines in each, boiler-houses with six boilers, a large chimney tower, the base being 31 ft. square, coal stores, workshops, &c. A light railway is to be constructed in connexion with the works, through Blagdon and Wrington, joining the Great Western Cheddar Vale line, from Bristol to Wells, at Congressbury, a distance of seven miles. The contractors are Messrs. J. Hodson & Son, of Nottingham; and Messrs. T. & C. Hawkesley, of Westminster, are the engineers.

## STAINED GLASS AND DECORATION.

**ST. JOHN'S CHURCH, PERRY BARR.**—A stained glass window has recently been erected in St. John's Church, Perry Barr. The subject is the youthful patron saint, St. John, and the Lamb. The window was designed by Mr. T. W. Camm, of Smetwick, and executed at his studio.

**WINDOW, BRAMPTON BIERLOW CHURCH, WEST MELTON.**—Last week one of the three-light windows in this church was filled with stained-glass. Each of the lights contains two panels under canopy work of perpendicular style. Mr. J. W. Knowles, of York, executed the work.

## FOREIGN.

**FRANCE.**—Mme. Adolphe d'Enery, wife of the well-known dramatic author, has just left to the State her hotel in the Avenue Bois de Boulogne, including the collection of objects of art which it contains. A mosque is being built near the Parc Monceau, the cost of which is borne entirely by the Mussulman colony in Paris. It is to cost about 900,000 francs.—The town of Clichy has just opened a competition for a large educational institution for boys and girls at an estimated cost of 600,000 francs.—A committee has just been formed to erect a monument of the historian Michelet, at St. Georges de Didonne, near Royau.—The necessary works for the establishment of a line from Laverne to Montbazin have been begun in the Département de l'Hérault.—The discovery of the tomb of Harcourt de Buell has just been made in the vaults of the Cathedral of Angers. He was bishop in the fourteenth century. The tomb contains much that is artistically interesting.—It is announced that the Duc d'Orléans has ordered one of the most eminent French sculptors to make a statue of the Empress of Austria to be placed on the shore of the Lake of Geneva, where she was so cruelly assassinated.—The Society "des Amis du Louvre" has already proved itself of use to the Government. This society, founded this year, undertakes to help the Louvre in purchasing works of art. It has already bought several pictures, amongst them the "Ecce Homo" by Piero della Francesca. The recognition of this society by the State enables it to receive donations and legacies.—The death of M. Alexandre Joseph Marie, at the age of sixty-one, is announced. He was architect to the Ville de Paris, Member of the "Commission d'Hygiène, and expert for the Tribunaux de Paris."

**CANADA: PROPOSED BRIDGE, QUEBEC.**—At the annual meeting of the Quebec Bridge Company, held on September 6, at Quebec, it was decided to at once call for tenders for the construction of the bridge, which is estimated to cost from \$3,000,000 to \$4,000,000. The amount of capital so far subscribed is \$285,000. The directors report states that the Dominion Government has given assurances that a subsidy of 33 1/3 per cent. of the cost of the enterprise would be voted at the next session of Parliament. It is expected that the Province of Quebec and the City of Quebec between them will vote subsidies amounting together to another third of the cost, and the balance of the cost will be met by issuing bonds. Attached to the report are extracts from those of the engineers, Messrs. Shanly, Shrieber, Gauvin, and Hoare, showing the impossibility of constructing the bridge for a reasonable sum elsewhere than opposite the Chaudière. The river is 2,505 ft. wide at high water, 43 ft. deep here. From the bed of the river to the lower edge of the bridge the distance will be 103 ft., and the length of steel bridging will be 3,100 ft. It is the intention of the Company to construct and own themselves the lines from the bridge into the City of Quebec, and also that from the south end of the bridge, which will connect at a concentrated point with all the railways on the south shore. On the north end traffic will be taken from the bridge to Quebec by either of two lines—one passing into the city along the coves on the north side of the river, and the other on the St. Foye village, entering the city by the St. Charles River valley.—*Canadian Gazette.*

**WESTERN AUSTRALIA.**—The prospectus of the intended Mining and Industrial Exhibition at Coolgardie, to be opened on March 21 next year, states that the original proposition was to hold a mining machinery exhibition, to be opened in October, 1897, but the proposal received so much support in the Colony that it became necessary to fix upon a later date, and to make the exhibition a more comprehensive one. It is now to be called "The Western Australian International Mining and Industrial Exhibition," the objects of which should be to obtain the fullest and best possible display of mining and other machinery, and of all kinds of manufactures suited to the requirements of the mining, timber, and agricultural industries of the Colony, and to its growing population. The Government of the Colony has agreed to frank all exhibits from the port of arrival, to and from Coolgardie, over their railways, and to treat the exhibition buildings as a bonded store, so that no charges will be made for freight or custom dues, excepting on goods sold in the Colony. The charges for space are exceedingly moderate, the commissioners being anxious, in the public interest, to offer every inducement to manufacturers and others to use the exhibition. Arrangements are being made to secure for exhibits of the various products of Western Australia—minerals, food, staples, timber, &c.—and to obtain representative exhibits from the other Australian colonies, while varied collections are assured from Great Britain, America, Canada, the Continent of Europe, the Cape, and India. Arrangements for Great Britain and the Continent are in the hands of the Special Commissioner, Mr. E. T. Scammell, who will be prepared, on behalf of the Commissioners, to ensure the transit of all exhibits at moderate rates, by duly appointed forwarding agents, and the safe custody of the exhibits on arrival in Western Australia. Certificates of merit will be awarded in every section, special certificates being given for

exhibits showing superlative merit. Copies of the regulations and forms of application for space may be obtained from the London Office of the Exhibition, 18, Queen Victoria-street, E.C., or from the Agent General's Office, Victoria-street, S.W.

**VICTORIAN INSTITUTE OF ARCHITECTS.**—The *Building Engineering and Mining Journal* (Melbourne) publishes the particulars and conditions for prize competitions offered by the Royal Victorian Institute of Architects, which are open to all members of recognised Institutes of Architects of the Australasian Colonies. They consist of the R.V.I.A. Silver Medal for the best design for a building for chambers for twenty physicians and surgeons, with rooms for manager and attendants, waiting and consulting rooms, together with all necessary accommodation, and showing method of sanitation; the R.V.I.A. Bronze Medal for the best design for public swimming baths and gymnasium. A prize of four guineas for measured drawings, the subject to be the stone pulpit and the eastern stairs to it in Scot's Church, Collins-street, Melbourne; and a prize of two guineas for sketches of subjects to be selected by the competitor.

## MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Mr. Howard Ince, architect, has removed his address from 21, King William-street, Strand, to 35, Lincoln's Inn Fields, W.C.—Messrs. Leslie E. Clift & Co. have purchased the business of Messrs. Hare & Co., of the staff of Messrs. Leslie E. Clift & Co.—We learn that a new company has been formed to carry on the manufacture of the various patents of the N.A.P. Window Company.

**ABBEE MANSIONS.**—It appears that we were led into an error last week, through adopting a statement in a daily paper to the effect that this building was to be pulled down, which turns out to be incorrect. It is, in fact, being strengthened in order to render it secure for occupation. We have since learned however, on the best authority, that the Office of Works, which was under an agreement to take over the building, has declined to carry out this agreement.

**THE ITALIAN HOSPITAL, QUEEN-SQUARE.**—It is stated that Commendatore J. Ortelli has generously undertaken to defray the cost, about 20,000l., of the new buildings to be erected on the square's south side between Devonshire and Gloucester streets. The architect, we gather, is Mr. Cutler, and the contractors Messrs. Holloway Brothers.

**PROPOSED BYRON STATUE FOR ABERDEEN.**—A public meeting to promote the erection of a statue of Lord Byron will be held on October 15 in Aberdeen Grammar School. The supporters now number about 200, and the success of the scheme is assured.

**FIRE AT BISHAM ABBEY, NEAR MARLOW.**—A fire broke out on Saturday, September 24, at Bisham Abbey. The flames originated in the roof, part of which, and several old oak beams, were removed. The damage was not very extensive.

**PUBLIC WORKS, SCARBOROUGH.**—On September 26 a Local Government Board inquiry was held at the Scarborough Town Hall with respect to the application of the Town Council for approval of the disposal by the Council of certain corporate land, situated in Seamer-road, and borrowing 33,575l. for the purchase of St. Nicholas House estate for municipal purposes, and for purposes of public walks and pleasure grounds. It was explained that the North-Eastern Railway Company required the land for the purpose of increasing their siding accommodation, and subject to the approval of the Local Government Board, would pay 350l. per acre for the land, at the same time agreeing to a condition imposed by the Council to allow a bridge to be made over the railway so as to connect Seamer-road with the Weaponaes estate, the railway company undertaking to pay 2,500l. towards the cost of the bridge.

**PROPOSED ALMSHOUSES, WEST HARTLEPOOL.**—The Diamond Jubilee is to be commemorated in West Hartlepool by the erection of almshouses, and gentlefolk have indicated their intention of defraying the cost of as many buildings.

**PUBLIC WORKS, SAFFRON WALDEN.**—A Local Government Board inquiry has been held at the Town Hall, Saffron Walden, respecting the application of the Town Council for sanction to borrow a sum of 1,400l. for footpath improvements. At a meeting of the Town Council a memorial was presented signed by several ratepayers, stating that at present some parts of the borough were insufficiently sewered, and others wholly deficient in public sewers, and insisting upon the first importance of the sewerage question.

**EAST LONDON TECHNICAL COLLEGE.**—We have received the calendar of this institution for 1898-99, with the list of classes in engineering, chemistry, and physics, mathematics, applied mechanics, machine construction and drawing, building construction and drawing, smith's work, pattern making, electrical engineering, drawing, wood carving, carpentry, bookbinding, &c., &c.



THE ARTS AND CRAFTS EXHIBITION, MANCHESTER.—There was a numerous audience in the City Art Gallery on September 26, when Mr. William Burton gave the first of a series of four lectures, arranged by the Northern Art Workers' Guild in connection with the Arts and Crafts Exhibition now being held. Mr. Edgar Wood presided, and Mr. Burton took as the subject of his lecture "Everyday Art." He briefly explained what were the necessary conditions any piece of work must possess before it was artistic at all. First came truthfulness and directness, simplicity and utility. Then came appropriateness, harmony, and unity, not only in the component parts of the piece of work itself, but harmony of the work with its entire surroundings, and last of all the vital qualities which distinguished high art from that which was not art; breadth, imagination, invention, and individuality. An artist was a man who could manage to combine absolute utilitarian necessities with aesthetic beauty by the simplest means. Any article of utility designed by an artist would seldom need any added ornament, though in some instances ornament had its uses, and plain surfaces were apt to become monotonous. But ornamentation required the gift of selection and restraint, with regard to fitness and appropriateness. He then dealt with naturalism and conventionalism, as applied to art, and altogether his lecture, illustrated as it was by means of limelight representations of appropriate examples of his chief points, was of a very interesting and practical nature.—*Manchester Courier.*

## LEGAL.

## A BUILDING DISPUTE.

THE case of Kitson v. Saunderson came before Mr. Justice Channell, sitting as Vacation Judge, on the 28th ult., on the application of the plaintiff for an injunction to restrain the defendant from the erection of a certain wall. When the case was called on, Mr. Kenyon Parker, for the plaintiff, said that the action had been settled, and the motion could therefore be struck out.

Mr. Alexander, Q.C., for the defendant, said that his learned friend might be right, but it was the first he had heard of the case having been settled.

Mr. Kenyon Parker said he understood that the defendant had bought the plaintiff out.

His Lordship: Let the case be struck out, and, if there is any misapprehension about it, it can be reinstated.

In the result, his lordship directed that the motion should stand for a week, in order that it might be ascertained what had been done in the matter.

## IMPORTANT BUILDING DISPUTE.

## MANDATORY INJUNCTION GRANTED.

THE case of Keeble v. Poole came before Mr. Justice Channell, sitting as Vacation Judge, on the 28th ult., on an application by the plaintiff to restrain the defendant, his servants, agents, and workmen, from erecting any wall or building so as to darken or obstruct the ancient lights of the plaintiff's premises, situate in Rupert-street, W.

Mr. Alexander, Q.C., who appeared in support of the application, stated that the plaintiff asked partly for a mandatory injunction that the defendant might be ordered to pull down so much of his wall between 8 and 9, Rupert-street, recently erected by him, or any other walls or buildings which interfered with the ancient lights of the plaintiff.

Mr. Lowe, counsel for the defendant, said he had been looking at the evidence in the case, and he was bound to say he was not able to contend that some rights of the plaintiff had not been infringed, the extent of the infringement being another matter. He had therefore advised the solicitors who instructed him that the proper course was to endeavour to negotiate between the two neighbours and get the matter adjusted. He (counsel) thought that if the matter was suspended for another week something might be done in some way. He agreed that his learned friend had a strong case, but at the same time he thought it was a matter which could be met by adjustment between the parties, and he thought that would be the proper way to deal with it.

Mr. Alexander said he must press for the injunction because there had been a breach of good faith on the part of the defendant; and, moreover, last week, when he gave an undertaking not to do anything in the terms of the notice of motion, he had, in spite of his undertaking, gone on with the building during the week, and he (counsel) was really in a position, if he felt not bound, to move to commit the defendant to prison for breach of his undertaking. Therefore, it was impossible to meet the defendant. On September 8 architects met on the ground with reference to the underpinning of the fence wall in question, and on that occasion it was stated what they were going to do as regarded the erection, and the plaintiff objected. The defendant thereupon undertook to proceed with this work until some arrangement had been come to. That undertaking, given on the 8th, was not in dispute. What happened was this. On September 10, which was a Saturday, the plaintiff went down to see the premises and discovered that, notwithstanding the undertaking given on the 8th, the

defendant had put a body or gang of men not to continue their work all round but to work on the party fence wall and get it as high as possible before the plaintiff could take proceedings. On the Saturday afternoon the plaintiff gave the defendant's builder and surveyor written notice to refrain from doing this, but, notwithstanding that, the building was continued all Sunday night and was only stopped on the Monday morning when the wall was raised from 11 ft. 6 in. to 34 ft. 6 in., and the defendant intended to raise it another 20 ft.

In the result his Lordship, after hearing Mr. Lowe for the defendant, said his view was that the defendant's building ought to be pulled down to the position in which it was on September 8; but as this was the Long Vacation, and the defendant could not take the opinion of the Court of Appeal on the subject (if he wished to do so), he (his lordship) thought that the order should be suspended for five weeks in order to allow the defendant to go to the Court of Appeal.

Mr. Alexander pointed out that the defendant had a remedy, notwithstanding the vacation, under Section 52 of the Judicature Act.

His lordship, after some further discussion, suspended the operation of the mandatory injunction for fifteen days, and on the other part of the case granted the plaintiff an interim injunction in the terms of the notice of motion until the trial, and directed that the plaintiff should have his costs in any event.

## ALLEGED OBSTRUCTION OF LIGHT AND AIR.

THE case of Lefevre v. the Cleveland House, Limited, was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 28th ult., it being an application by the plaintiff for an injunction to restrain the erection of a building by the defendants so as to obstruct the access of light and air to the plaintiff's premises.

When the case was called on, counsel for the plaintiff stated that both parties had agreed that the motion should stand over for a week or a certain agreed time.

Order accordingly.

## ALLEGED OBSTRUCTION OF ANCIENT LIGHTS.

THE case of Oppert v. Cochrane and Others was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 28th ult., on the application of the plaintiff to restrain the defendants from carrying on building operations so as to obstruct his ancient lights.

When the case was called on, counsel stated that the motion ought not to have been in the list at all. When the case was before the court last week it was ordered to stand over for a fortnight.

His Lordship: I have it marked "Stand over for a week" and that is how the officer of the court made the mistake, I suppose. However, let it stand till next Wednesday.

Order accordingly.

## ANCIENT LIGHT DISPUTE.

THE case of Brown v. Sheinman and Volk was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 28th ult., on the application of the plaintiff to restrain the defendants from erecting buildings so as to obstruct his ancient lights.

When the case was called on, Mr. Kinyon Parker, for the plaintiff, said that all parties agreed that the case should stand over till next week.

Counsel for the defendants said he consented, but it was the first he had heard of it.

## DISPUTE AS TO BUILDING EXCAVATIONS.

THE case of Bagby and Harper v. Down and Another was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 28th ult., on a motion by the plaintiffs to restrain the defendants from carrying on certain building excavations.

When the case was called on, counsel stated that his lordship had already granted an interim injunction restraining the defendants in the terms of the notice of motion, and the defendants now consented to submit to a perpetual injunction, and to treat the motion as the trial of the action. In these circumstances the plaintiffs would not ask for costs.

His lordship assented to the application, and made an order accordingly.

## MEETINGS.

SATURDAY, OCTOBER 1.

British Institute of Certified Carpenters.—Mr. J. Clark on "Graphic Statics applied to Carpentry Structures." 6 p.m.

Sanitary Institute.—Congress at Birmingham: Excursions.

MONDAY, OCTOBER 3.

Liverpool Architectural Society.—First Ordinary Meeting. 6 p.m.

"Society of Engineers.—Mr. Sheard Cowper-Coles on "Protective Metallic Coatings for Iron and Steel." 7.30 p.m.

TUESDAY, OCTOBER 4.

Northampton Institute, Clerkenwell.—Mr. F. Bond on "Traceried Windows." 8 p.m.

WEDNESDAY, OCTOBER 5.

Edinburgh Architectural Society.—Mr. A. R. Scott on "Vaulting." 8 p.m.

Builders' Foremen and Clerks of Works' President Institution.—Ordinary meeting. 8 p.m.

FRIDAY, OCTOBER 7.

Architectural Association.—President's Opening Address and Distribution of Prizes. 7.30 p.m.

## RECENT PATENTS:

## ABSTRACTS OF ACCEPTED SPECIFICATIONS.

## Open to opposition until November 7.

[1897] 29,955.—SLEEVES OR SOCKETS FOR SIMULTANEOUSLY CONNECTING GLOBES, REFLECTORS, AND THE LIKE TO ELECTRICAL INCANDESCENT LAMPS: C. Barientstein.—This is made in the shape of a lamp-foot or base, and is screw-threaded. Into an inner tube is screwed the pear-shaped globe, with the result that one contact of the lamp meets a contact which is as usual secured to the outer part of the sleeve by an insulating piece, whilst the other contact of the lamp is electrically connected with the sleeve or socket's outer part through the inner tube. In placing the reflector (or globe or dome) on the lamp it is slipped with its centrally perforated part over the inner tube, and secured in position by a nut having a wide flange, the reflector's top being made to bear against the enlarged lower edge of the socket's outer part.

20,063.—SINKS, JAW-BOXES, WASHING-TUBS, TROUGHS, &c.: J. Robertson.—The inventor's object is to reduce the risk of breaking brittle articles when being washed, and to replace the bottom of the sink when worn. He substitutes a bottom of india-rubber, or fibre gutta-percha, or wood—the sides of the sink or trough being made of porcelain, fire-clay, metal, or wood. In the case of, for example, a fire-clay enamelled sink of the ordinary square or Belfast pattern, a horizontal flange protrudes outwardly from the four sides, the flange is perforated, a sheet of india-rubber is laid to form a bottom, and underneath the rubber is placed a sheet of iron; the flanges and the rubber and iron sheets are fastened by strips of iron, the whole being screwed together. By another method the bottom of the sink may be made of plain fire-clay, to be covered by an india-rubber sheet sunk within grooves in the sides of the sink.

20,465.—SANITARY CLOSETS AND CULINARY DRAIN-AGE: A. H. Stott.—The device relates to improvements in apparatus for consuming urine and soil, and vaporising culinary water from the slop-stone. The apparatus consists of three 10-in. burners and an oil cistern fixed beneath a spiral flue, at whose top is placed the closet seat, with pan and valves for delivery into the flue, the oil for saturating the dried soil in the flue is discharged through a 3-in. pipe long enough to contain a gallon of oil, the burners under the perforated plate are lighted by iron leads trimmed with cotton wool steeped in oil, which roll down the spiral incline.

22,170.—LIGHTING OF PASSAGES, CORRIDORS, AND OTHER PLACES: W. G. Ingfield.—For places where a light is needed only occasionally, or in different parts, the lamp—whether oil, gas, or electrical—is suspended from a wire or similar device mounted throughout the entire length of the passage or corridor, the suspension being effected by means of a ring or loop and a length of elastic material. When an electrical lamp, or a gas lamp supplied through a flexible tube, is used, a sufficient length of conducting wire is allowed for the full traverse of the lamp, and the wire is hung in loops from the carrier wire.

23,184.—SASH FASTENER FOR WINDOWS: J. Walsh.—On the lower window's top frame is screwed a bracket which has two lugs or sides, and carries an eccentric arm or lever working on a pin between the two lugs; the eccentric is fitted with a strap or ring which has a curved or hook-shaped projecting piece passing under a guide between the two lugs and engaging with a loop-shaped bracket screwed on the top-window's lower frame; the window is unfastened by pulling the lever on the eccentric and so causing the eccentric block to travel round the pin's top side and draw the hook out of the loop, it is fastened by pressing the lever in an opposite direction and so causing the eccentric to first travel downwards towards the loop which receives the hook, a further depression of the lever causes the eccentric to travel still downwards away from the loop, and so presses the hook's under-side against the bottom of the bracket, thus raising the hook's point and making it engage with the top of the loop.

23,778.—APPARATUS FOR RETAINING WINDOW SASHES, &c.: W. A. Stevens and A. H. Butt.—A stop, having a curvilinear face and a tongue and guides, is mounted in a cage fitted in the frame or sash, and has grooves to receive the tongue or guides, a spring in the cage bears upon the rear of the stop, and on or in the edge of faces of the sash or frame is fitted a curved path, consisting of reversely curved parts joined by inclined straight parts, so disposed as to form an irregular path which causes the spring to be compressed with a less traverse of the sash when descending than when ascending, thus the external force required for raising or lowering the sash is reduced.

23,930.—STEEL-PLATE WEIGHING MACHINES: W. E. Hopkins.—The claim is for the use of a counterpoise or jockey weight, arranged to slide upon a supporting tube or rod fixed at the side of said weighing machine, or on a yard, the said weight being so arranged that its centre of gravity falls below its supporting tube or rod, and on the side of it, adjacent to the steel-plate.

18,691 5075.—ORNAMENTING GLASS, TRANSPARENT MATERIAL, &c.: E. J. Lutwyche.—The back of the tile, panel, or mosaic, is crimped, rippled, or corrugated; after precipitation of silver, the silvered surface may be coated with brilliant metallic paint, leaf silver, tin, or other metal, and the coating is covered or backed with a lead or metallic paint, or with asphaltum. The tiles are made of coloured glass, bleached resin, and similar substances, except crystal or flint glass.

9,340.—ELECTRICAL SAFETY FUSES OR CUT-OUTS: Verity, Limited, and L. J. Steele.—The fuse device has a shifting chamber, tube, or trough, containing an insulating material or fluid, which is held in check or suspension against an automatically moving force by the fuse



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Pump Room .....	Harrington Corp. ....	500 200. and 200. ....	Jan. 2, '99

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Engine Shed, &c. Truro .....	G. W. Ry. Co. ....	G. K. Mills, Paddington Station, W. ....	Oct. 4
Goods Shed, Swanscombe .....	do. ....	do. ....	do.
Additions to School, Brierley Hill, Staffs. ....	Kingswinford U.D.C. ....	A. Price, 34, Moor-street, Brierley Hill, Staffs. ....	do.
Sewage Works .....	J. Clark, Archt., 55, Norfolk-street, Sheffield. ....	do. ....	do.
Boiler House, &c. Elfr Vale Workhouse .....	Sheffield Union .....	do. ....	do.
Flagging, &c. ....	Uxbridge (Lancs.) U.D.C. ....	do. ....	do.
Whitestone, &c. ....	Whitkain (Durham) U.D.C. ....	T. Lambart, Town Hall, Whitkain, Durham. ....	do.
Paving, &c. Moss-street and Others .....	Keighley Corp. ....	W. H. Hopkins, G.E. Low, Bridge, Keighley. ....	do.
Broken Stone, &c. ....	Handsworth (Staffs.) U.D.C. ....	E. Kenworthy, Surv. Council House, Handsworth, Staffs. ....	do.
Electric Plant, &c. ....	Dundee Gas Company .....	W. B. Pittman, Eng. Dundee, Dundee, Dundee. ....	do.
Road Making .....	Lewisham B. of W. ....	G. R. W. Wheeler, Town Hall, Carlton-street, S.W. ....	do.
*Wood Paving Works .....	Westminster U.D.C. ....	A. T. Colloby, 22, Museum-street, Ipswich. ....	Oct. 5
Sewage Filter, &c. Tattingstone, Suffolk. ....	N.E.R. Co. ....	W. N. Bell, Archt. York. ....	do.
Twenty-two Houses, Shildon, Durham. ....	Buckley R.D.C. ....	J. Burgess, Surv. 7, Market-street, Althorp. ....	do.
Streets and Sewers, Croydon, Surrey. ....	do. ....	E. W. M. Corbett, Surv. Council House, Croydon. ....	do.
Two Houses, Baslow, Derbyshire. ....	do. ....	E. M. Longman, Archt. Town Hall, Baslow. ....	do.
Paving, &c. Several Streets .....	Radcliffe (Lancs.) D.C. ....	Surv. Council Office, Radcliffe, Lancs. ....	do.
Drainage Works, Whimble Hill, Oxford. ....	Parham & Hartley, Whitley School Mgrs. ....	E. Kempson, 121, West-st., Parham. ....	do.
Alterations, &c. Palace Court, Middle-top, Lancs. ....	Standing Joint Firms, Manchester U.D.C. ....	H. Howard, Surv. Town Hall, Manchester. ....	do.
Street Works, Gloucester, &c. ....	do. ....	B. Butterfield & Sons, Archt. Queen-st., Morley. ....	Oct. 6
House and Shop, Fountain-st. Morley. ....	Manchester Corp. ....	City Surv. Town Hall. ....	do.
Two Locks Conversions, Helmsdale, Recreation Ground. ....	Southdown-on-Sea Corp. ....	A. Fisher, G.E. Clarence-st., Southdown-on-Sea. ....	do.
Rowley Granite .....	Quarry Bank (Staffs.) U.D.C. ....	A. Howgill, Cradley Heath, J. S. Crawshaw, Council Office, Quorn. ....	do.
Parham Flints and Gravel. ....	Weybridge U.D.C. ....	E. R. S. Scott, C.E. Town Hall, Weybridge. ....	do.
Road Works, Becher-st. &c. ....	do. ....	W. E. Stephenson, Eng. Council Office, Becher-st. ....	do.
Cast Iron Water Pipes, &c. Rowland's Gill. ....	do. ....	do. ....	do.
Wharfedale, &c. ....	do. ....	do. ....	do.
Shop, &c. Prospect-place, Bridlington Quay. ....	G. Wortley, ....	J. Barnshaw, Archt. Bridlington Quay. ....	do.
Additions to School, Bloughton. ....	Bd. ....	E. L. Smith, Archt. 20, High-street, Guildford. ....	do.
*Supply and Fitting Pipes, Valves, &c. Church, Hindford, near Atherton. ....	Rev. J. Preston ....	J. Patten Barlow, Vestry Hall, Upper-st. Islington. ....	Oct. 7
Hospital, Moriston, Elgin, N.B. ....	do. ....	A. L. Buchanan, Becher-st., Glasgow. ....	do.
Offices, Wall, &c. South-st. Egremont. ....	do. ....	W. Stead, C.E. County Offices, Northumberland. ....	Oct. 8
Stone Bridge, Saltburn, Yorks. ....	do. ....	do. ....	do.
Broken Granite, &c. 1,530 tons. ....	Wharfedale U.D.C. ....	H. E. Watling, Surv. Council Office, Wharfedale. ....	do.
Granite Sella, Swinton, Lancs. ....	do. ....	do. ....	do.
Subway, &c. Queen's Dock Basin. ....	do. ....	F. J. Bancroft, Eng. Town Hall, Croydon. ....	do.
Granite for Footpaths .....	Leicester Corp. ....	A. Saxon Smith, 22, South-lane, Leicester. ....	Oct. 10
*Mortuary at Infirmary .....	St. Marylebone Gdns. ....	do. ....	do.
*School .....	Rowley Regis, S.B. ....	do. ....	do.
Sewering, Flagging, &c. Carlisle-street. ....	Hindley Lauch, U.D.C. ....	A. A. Holden, C.E. Council Office, Hindley Lauch. ....	do.
Granite Road Metal .....	Stittingbourne U.D.C. ....	A. Harris, Council Office, Stittingbourne. ....	do.
*Street Works, Chadwell St. Mary. ....	Orest, Essex. ....	R. T. Stewart, Surv. Orest. ....	do.
*Quernway Granite Spalls .....	Lewisham U.D.C. ....	H. C. Mott, 250, High-st., Lewisham. ....	do.

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Boiler House .....	Cheltenham Corp. ....	Water Engineer, Municipal Office. ....	Oct. 15
Bridges, Totteridge .....	Herts. C.C. ....	U. A. Smith, Surv. 41, Parliament-street, S.W. ....	do.
*Roads and Footways .....	Barnet U.D.C. ....	Y. H. Manbridge, 40, High-street, Barnet. ....	do.
*New Bridge .....	Hertford C.C. ....	U. A. Smith, 41, Parliament-street, S.W. ....	do.
Isolation Hospital, Tisdale-crescent, near Bishop Auckland. ....	Auckland, Shildon & Willington Hospital Board. ....	W. Perkins, Archt. Victoria-street, Bishop Auckland. ....	Oct. 17
*Iron Hospitals .....	do. ....	do. ....	do.
Public Baths .....	do. ....	do. ....	do.
Hall and Buildings, London-road. ....	Southborough U.D.C. ....	do. ....	do.
Alms-houses, Lyme Regis, Dorset. ....	do. ....	W. J. Fletcher, Archt. Wimblesbury. ....	Oct. 15
*Hall and Buildings .....	Southborough U.D.C. ....	do. ....	do.
*Buildings, Chimney Shaft, &c. ....	Banger Corp. ....	do. ....	do.
Additions to House, &c. Brynhyfryd, Ruthin. ....	School Governors. ....	J. Hughes, Archt. Denbigh. ....	Oct. 15
Additions to School, Llandaf. ....	Governors. ....	G. E. Halliday, Archt. Cardiff. ....	Oct. 13
*Enlargement of Telegraph Factory. ....	Comma H.M. Works. ....	W. Cobbett, Swan-street. ....	Oct. 21
Sewage Works .....	do. ....	do. ....	do.
*Schools .....	Tottenham S.C. Bd. ....	G. E. T. Lawrence, 181, Queen Victoria-st. E.C. ....	Oct. 21
School, Locking-road. ....	Weston super-Mare Sch. Bd. ....	do. ....	Oct. 26
*School and Carriage's Cottage. ....	do. ....	do. ....	do.
Alterations, Horse-shoe Inn, Shire-green. ....	do. ....	do. ....	No date
Additions to Grammar School, Chesterfield. ....	do. ....	do. ....	do.
Town Hall .....	Colchester Corp. ....	H. C. Winkley, Town Clerk Colchester. ....	do.
Paving, &c. Main Roads. ....	Kingshorpe U.D.C. ....	J. Isman, Surv. Falmouth. ....	do.
Bakery, &c. Cork. ....	J. Simcox. ....	A. Hill, Archt. 22, Gorge-st. ....	do.
Ten Houses, Folly Hall. ....	Ruddersfield Indus. Soc. ....	J. Berry, Archt. 9, Queen-street, Ruddersfield. ....	do.
Alterations, &c. Piece Inn, Eldwick, near Bingley. ....	do. ....	do. ....	do.
*Chapel, Ball Hall, Lavenham, Suffolk. ....	do. ....	do. ....	do.
Alterations, &c. Business Premises, Charleston-street, Hull. ....	do. ....	do. ....	do.
House, Manville-road, Lind Park. ....	do. ....	do. ....	do.
Business Premises, Parliament-street, Harrogate. ....	do. ....	do. ....	do.
Bakery, 22, Ball Hall, Birmingham. ....	J. Hunter. ....	T. G. Price, Archt. 63, Temple-row, Birmingham. ....	do.
Roads, &c. DePierres Estate, Harrogate. ....	do. ....	do. ....	do.
House, Llanurch, Llanelli. ....	do. ....	do. ....	do.
Houses, Longtown, near Abergavenny. ....	Longtown U.D.C. Bd. ....	E. A. Johnson, Archt. 1, Broad-st., Longtown. ....	do.
Three Outfalls, High-street, Black-burn. ....	do. ....	do. ....	do.
*Fifty-three Cottages and Five Blocks of Tenants' ....	do. ....	do. ....	do.
*Enlargement of Baths and Washhouses. ....	Taunbridge Wells Corp. ....	Burns Surv. ....	do.
do. ....	do. ....	A. H. Tittman, 4, John-st. Bedford-row, W.C. ....	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works .....	St. Mary Extra, Shalton and Hound Sch. ....	.....	Oct. 5
*Inspector of New Buildings and Drainage Work .....	Hornsey U.D.C. ....	1000. per annum. ....	Oct. 8
*Clerk of Works .....	do. ....	1000. per annum. ....	Oct. 19
*Engineer, Surveyor, and Sanitary Inspector. ....	Wembley (Mid.) U.D.C. ....	2200. rising to 2800. ....	do.
*Architectural Assistant. ....	H. M. Dockyard, Devonport. ....	.....	No date
*Clerk of Works .....	Manusfield Sch. Bd. ....	40. per week. ....	do.

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, vi, viii, x, & xvii. Public Appointments, pp. xv, & xvii.

wire that passes through the tube, and whose free ends are connected with the terminals upon the switch-board or block within the circuit. The parts are so arranged that when the free wire "blows" its loose free end is instantly and at a multiple rate drawn within the tube or chamber, and under the insulating material therein, so that, according to the claim, the possibility of any electric arc being formed is prevented.

13,742.—GLASS PANES FOR WINDOWS AND OTHER ILLUMINATING PURPOSES: O. E. Winger.—The panes are made in various ways: (a) built up of a number of blocks of glass placed together with their faces in contact, the faces being smooth and polished, whereby the upper face of each block forms the light-reflecting surface; (b) with a series of openings or cavities, disposed lengthwise between the two surfaces, whose upper walls act as reflecting surfaces, while the side walls act as refracting surfaces; (c) with a series of tapering cavities that extend lengthwise into the pane from one edge, while another similar series extends into the pane from the opposite edge; the upper walls of the cavities constitute the reflecting surfaces, and the side walls the refracting surfaces.

14,722.—GAS COOKING-STOVES: T. C. Wilson.—The novelty lies in the adoption of a stove top having a chamber over which is placed a detachable boiler, having a jacket which forms a hot chamber around its four sides, and provided with an outlet pipe, the underside of the top has a rim and dividing plates or ribs to conduct the heated air and waste products of combustion to the chamber; a flue pipe connects to a cavity over the oven and the chamber's underside; and the fitting of the burners centrally across the bottom of the oven instead of around its sides.

15,510.—PREPARATION OF SAND OR THE LIKE FOR USE

IN MAKING MOULDS OR CORES: T. Robinson.—The inventor uses sawdust or similar powdered woody substance, mixed with water having clay suspended therein, or with clay moistened with water, so that the particles of sawdust become impregnated or coated with clay; the sawdust is partially dried in an oven and then mixed with the sand or loam to be used for moulds. He claims to overcome the difficulty of re-using sand for facing the moulds in consequence of the heat of the first casting destroying the sand's adhesive property and to dispense, in a great measure, with the use of powdered coal commonly used for facing sand.

15,599.—PIPE COUPLINGS: V. A. Jensen.—For coupling small pipes is employed a nut composed of two parts which interlock, and having at one end an inwardly-directed flange or rim, the pipes have at one end a cylindrical screw-threaded head and a rim or collar, respectively, and the coupling is effected by screwing the nut into position.

16,095.—ACETYLENE GAS GENERATORS: H. Zant.—The object of this invention is to ensure that the contents of each cell containing the calcium carbide shall in succession be converted into gas and be again re-charged without disengaging the operation of the apparatus. A reservoir is fastened to the bottom of a cistern and is closed at the top by a cap, its lower part having holes that admit water; in the cap are air-tight cylinders which contain water, and the cylinders have cocks serving for water inlet and gas outlet, and each differs from the others in that it is at a different height above the water level, so that one cylinder comes into operation when the other lower lying one has been flooded and has finished its operation.

Open to opposition until October 31.

[1898] 16,241.—SELF-CLOSING DOOR HINGE: J. Wagner.—An internally secured projecting bush or bracket is secured

to the wall or door frame; the hinge screw has a right and a left hand thread, with a collar lying between the oppositely screwed ends, and the hinge plate or bar carries an internally screwed bush. The hinge screw is so set in the bushes that when the door is closed the bushes and the collar are close together; when the door is opened in one direction the bush and the hinge plate rise with the door; when it is pulled in the opposite direction, the hinge screw, the bush, and the hinge plate rise with the door. Thus, in whichever direction the closed door is moved it rises, and its own weight effects the closing of the door.

## NEW APPLICATIONS.

September 12—17.

19,336, W. Simon, Acetylene Gas Lamps, 19,337, R. J. Rudd, Electrical Apparatus for Regulating Clocks, 19,345, F. Warren, Chimney Cowl, &c., 19,350, Montag and Others, Steam and Water Turbines, 19,356, W. North, Saw Guard, 19,357, C. Paterson, Blind Roller Mountings, 19,357, Goddard and Others, a Saw, specially applicable for use where there is a continuous feed, 19,363, G. Whitaker, Water Boilers, 19,365, J. Ross, 19,365, A. Brown, 19,674, J. V. Robinson, and 19,683, T. R. Waite, Generation of Acetylene Gas, 19,734, Edwards & Frazer, Apparatus for the Storage of Acetylene Gas, 19,831, M. Walker, Electrical Tractor, 19,832, A. Furno, Alloy for Soldering Aluminium, 19,835, L. C. Boyle, Burners for Burning Hydrocarbons, 19,899, P. Mersch, Arc Lamps, 19,909, F. Ross, Measuring and Cost Indicating Apparatus, 19,909, F. Liegler, Mathematical Drawing Instrument, 19,910, R. W. Little, Cutting or Planing Devices for Curved or Irregular Surfaces of Wood, &c., 19,918, Oppenreich and Others, Telephonical Installations, 19,920, J. Riley, and 19,901, J. Riley, Lock Mechanism, 19,922,



LONDON.—For rebuilding No. 15, Devonshire-square, E.C., for Messrs. Clapham, Fitch & Co. Mr. Howard Chatfield Clarke, architect, 65, Bishopsgate-street Within, E.C. :—

Hall, Bredna & Co.	£4,821	Patrick & Son	£4,648
Brown, Son, & Blomfield	4,788	J. Smith & Sons	4,497
C. P. Roberts	4,763	Asby & Horner	4,479
E. Lawrence & Sons	4,711	Woodward & Co.	4,460



LONDON.—For the erection of warehouse at Gun and Shot Wharf, Tooley-street, for Mr. Graves. Messrs. Waterman & Lewis architects.—  
 F. A. Romer ..... £15,917  
 Outwater & Son ..... 14,751  
 Greenwood ..... 14,881  
 Howell J. Williams ..... 14,262

LONDON.—For pulling down and rebuilding the "Green Dragon" public-house, Bernandsey-street, for Mr. De Geat. Messrs. Elkington & Son, architects.—  
 Bailey Son & Holmes ..... £5,097  
 Smith & Sons ..... 4,948  
 P. & H. F. Higgs ..... 4,823

LONDON.—For alterations and additions at the "Vine Tavern" public-house, Broad-street, Ratcliff, E., for Messrs. Holt & Co. Mr. Fred. A. Ashton, architect, 77, Renford-road, Stratford, E.—  
 T. & H. Cocks ..... £1,089  
 A. E. Symes ..... £1,040

LONDON.—For the erection and completion of two factories in Ward-road, Stratford, for Messrs. Morris Strimmer & Co. Mr. John Pugh, architect.—  
 A. Reed & Son ..... £4,521  
 C. P. Roberts ..... 4,459  
 Greger & Son ..... 4,168

LONDON.—For alterations, &c., at Tottenham Court-road Police-station, for the Receiver for the Metropolitan Police District. Mr. J. Darn Butler, architect. Quantities by Mr. W. H. Thurgood.—  
 Farnham & Fotheringham ..... £14,391  
 Chessum & Sons ..... 14,561  
 Holloway Bros. .... 14,478  
 J. Groves & Son ..... 14,397  
 W. H. Laxelles & Co. .... 14,343  
 Higgs & Hill ..... 13,941

MANCHESTER.—For the erection of accident and out patients department at the Ancoats Hospital. Mr. W. Cecil Hardisty, architect, Manchester. Quantities by Mr. Charles Jackson.—  
 W. Southern & Sons ..... £2,897  
 F. & E. Haynes ..... 2,656  
 G. Whittell ..... 2,600

MERTHYR TYDFIL.—For rebuilding "Glove and Shears" inn, Merthyr. Mr. C. M. Davies, architect.—  
 E. Lumley ..... £943  
 J. Jenkins, Merthyr ..... £817  
 Tydfil (accepted) .... 849

MONEYNEANY (Ireland).—For new church, for the Rev. P. Grant. Mr. Toye, architect, Strand, London.—  
 R. Colburn ..... £3,590  
 J. Denry ..... 3,597

PENRHILWCFIBER.—For the erection of the Osborne Hotel, Penrhilwcfiber, for Mr. W. H. Matthews. Messrs. Morgan & Ffion architects.—  
 A. H. Williams, Pontypool ..... £1,000

PONTARDULAIS.—Accepted for the erection of a house and shop, Hendy. Messrs. Davies & Sons, architects, Llanelli.—  
 Geo. Hughes, Pontardulais ..... £11

RUGBY.—Accepted for additions to schools, Long Lawford, for the Newbold upon Avon School Board. Mr. T. W. Willard, architect, Market-draw Rugby.—  
 C. H. Rainbow, Rugby ..... £35

SOUTHAMPTON.—For the erection of a pair of houses in Langford-road, Southampton, for Mr. W. H. Abbott. Messrs. Ford & Sanders, architects, 23, Portland-street, Southampton.—  
 E. F. Barrow ..... £1,668  
 Hood & Rabbett ..... 1,761

\* Accepted subject to variations.

**C.B.N. SNEWIN**

MAHOGANY, WAINSCOT, WALNUT,  
 TEAK, VENEER, and TIMBER MERCHANT  
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17, BACK HILL,  
 HATTON GARDEN, and 29, RAY STREET,  
 FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
 THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
 Telephone, No. 774 Holborn. Tele. Address: "SNEWIN, London."

SLIGO.—Accepted for the erection of a residence at the work-house hospital, for the Guardians of Sligo Union. Mr. W. E. G. Kerr, architect, Wine-street, Sligo.—  
 George Kerr, William street, Sligo ..... £1,195

TENBURY.—For building a retaining wall, Kyre Brook, for the Rural District Council. Mr. K. W. Jarvis, Tenbury, District Council Offices, Tenbury.—  
 Thus, Vale ..... £245  
 H. Hewitt & Sons ..... 259

TOTTENHAM.—For pulling down and rebuilding Markfield House, Markfield-road, Tottenham. Messrs. Grawater, architects, Tottenham.—  
 Stewart ..... £1,155  
 Pater ..... 1,200  
 Hawley (accepted) ..... £937

TROEDRHIW (Wales).—For the erection of eight houses for Mr. I. Stephens. Mr. C. M. Davies, architect, 112, H.2-a-street, Merthyr Tydfil.—  
 Wm. Lloyd ..... £1,500  
 M. Marlow ..... 1,423  
 J. Jones ..... 1,376  
 D. L. Jones ..... 1,219

WAKEFIELD.—Accepted for the erection of Wesleyan Sunday School, &c., South Kirkby, for the Trustees. Mr. G. F. Pennington, architect, Carlton-street, Castleford.—  
 H. Gundill, South Gate, Pontefract ..... £544

WOOLWICH.—For rebuilding Nos. 37, 39, 41, 43, and 45, Poole-street, Woolwich, for Messrs. Carter. Messrs. Church, Quick, & Whinop, architects, Walsley street, Woolwich.—  
 Brading ..... £4,771  
 Holloway ..... 4,594  
 Goad ..... 4,571

W. R. G. H. W. (amounts should have been stated): W. R. C. H. B. (below our limit).—H. J. W. (sent too late).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to contribute to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

**J. J. ETRIDGE, Jr.**

SLATE MERCHANT,  
 SLATER and TILER.

ESTIMATES GIVEN FOR  
 SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,

Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to

BETHNAL GREEN SLATE WORKS,  
 BETHNAL GREEN, LONDON, E.

#### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 12s. per annum (12 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 95s. per annum. Remittances payable to DOUGLAS FOURDRINIER should be addressed to the publisher of "THE BUILDER," No. 44, Abchurch-lane, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 12s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

#### THE BATH STONE FIRMS, Ltd.

BATH.  
 FOR ALL THE PROVED KINDS OF  
 BATH STONE.  
 FLUATE, for Hardening, Waterproofing,  
 and Preserving Building Materials.

#### HAM HILL STONE.

#### DOULTING STONE.

The Ham Hill and Douling Stone Co.

(Incorporating The Ham Hill Stone Co. and C. Trank & Co. The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-hill,  
 Somerset.

London Agent:—Mr. E. A. Williams,  
 16, Craven-street, Strand.

#### Asphalte.—The Seyssel and Metallic Lava

Asphalte Company (Mr. H. Glenn), Office, 42,  
 Poultry, E.C.—The best and cheapest materials for

damp courses, railway arches, warehouse floors,  
 flat roofs, stables, cow-sheds and milk-rooms,

granaries, tun-rooms, and terraces. Asphalte  
 Contractors to the North Bridge Co. [ADVT.]

#### SPRAGUE & CO'S, Ltd.,

INK-PHOTO PROCESS,

4 & 5, East Harding-street,

Fetter-Lane, E.C. [ADVT.]

#### QUANTITIES, &c., LITHOGRAPHED

accurately and with despatch.

#### METCHIM & SON

4, PRINCES STREET,  
 ST. GEORGE'S ST. WESTMINSTER.

"QUANTITY SURVEYORS' DIARY AND TABLES"  
 For 1898, price 6d. post 7d. In leather 1/- Post 1/4 ADVT.

#### THE

#### French Asphalte

COMPANY.

Suffolk House, Cannon-street, E.C.

SUPPLY THE BEST MATERIAL AND

WORKMANSHIP FOR BUILDINGS,

DAMP COURSES, AREAS, ROOFS,

WASHHOUSE AND DAIRY FLOORS,

&c., &c.

This Asphalte was chosen to be

laid at Sandringham, on the new

General Post Office, and other

important buildings.

#### TWELVE GOLD AND SILVER MEDALS AWARDED.

# IRON CISTERNS.

## F. BRABY & CO.

VERY PROMPT SUPPLY.

LARGE STOCK READY.

Particulars on application.

CYLINDERS FOR HOT-WATER CIRCULATION.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL:  
 6 and 8, HATTON GARDEN.

GLASGOW:  
 47 and 49, ST. ENOCH-SQUARE.

BRISTOL:  
 ASHTON GATE WORKS, CORONATION-RD.



## ILLUSTRATIONS.

### Architecture of Newcastle-on-Tyne:—

Bank of England (the late Benjamin Green); Lambton's Bank (the late Benjamin Green); Central Exchange Buildings (the late Benjamin Green); Co-operative Printing Society's Premises (Mr. F. W. Rich); the Ouseburn Schools (Mr. F. W. Rich); Business Premises, Pilgrim-street (Mr. F. W. Rich).....	Double-Page Ink-Photo.
St. Matthew's Church—Tower, Chancel and Reredos, and Nave (Messrs. Hicks & Charlewood); St. Michael's, Westmoreland-road (Messrs. Dunn, Hansom, & Fenwick); St. Mary's Church—Reredos (Messrs. Hicks & Charlewood); the Lantern, St. Nicholas.....	Double-Page Ink-Photo.
Sandyford-road Board School (Messrs. Armstrong & Knowles); Home for Incurables (Mr. E. Shewbrooks); Business Premises, Newgate-street (Mr. E. Shewbrooks); Northern Assurance Company's Offices (the late R. J. Johnson); Guildhall Chambers (Mr. E. Shewbrooks).....	Double-Page Ink-Photo.
St. Nicholas Cathedral—Measured Drawings of Spire (Messrs. Oliver & Leeson).....	Double-Page Photo-Litho.
All Saints' Church (David Stephenson).....	Single-Page Photo-Litho.
Business Premises, Westgate-road (Messrs. Armstrong & Knowles).....	Single-Page Photo-Litho.
Co-operative Wholesale Society's New Offices, Warehouses, and Conference Hall, Blandford-street (Messrs. Oliver & Leeson).....	Single-Page Ink-Photo.
Business Premises, Collingwood-street (Messrs. Oliver & Leeson).....	Single-Page Photo-Litho.

### Blocks in Text.

#### Architecture of Newcastle-on-Tyne:—

The Castle—East View of the Keep .....	Page 374
Business Premises, Mosley-street.....	" 375
St. Nicholas Church—Plans of two Stages of Lantern .....	" 376
The Central Station .....	" 376
Jesus Hospital .....	" 377
Royal Jubilee Board School.....	" 377

#### Architecture of Newcastle-on-Tyne (continued):—

Jesus Hospital—One of the Newel Finials .....	Page 377
Jesus Hospital—The Staircase .....	" 377
National Telephone Company's Offices .....	" 378
Durham University Medical College .....	" 379
Durham College of Science .....	" 380
.....	Page 381

## CONTENTS.

### The Architecture of Our Large Provincial Towns: No XVIII.

Newcastle-on-Tyne.....	393
Notes.....	393
East Ham Public Buildings Competition .....	393
The Sanitary Institute Congress, Birmingham .....	393
Illustrations.....	396
Health Exhibition, Birmingham.....	396
The London County Council.....	397
Applications under the 1954 London Building Act .....	398

Competitions .....	399
Engineering Societies .....	399
Books Received .....	399
National Society for Checking the Abuses of Public Advertising .....	399
The Scarcity of Water .....	399
Fittings Not in Accordance with Contract .....	399
An Old London Mausoleum .....	399
The Students' Column: Sound, Light, and Heat.—XV. ....	399

General Building News .....	398
Sanitary and Engineering News .....	398
Stained Glass and Decoration.....	398
Foreign.....	398
Miscellaneous.....	398
Legal.....	398
Meetings.....	398
Recent Patents.....	398
Some Recent Sales of Property.....	398

### The Architecture of Our Large Provincial Towns.

#### XVIII.—NEWCASTLE-ON-TYNE.



COMPARISON of the past and present of almost any of our large towns brings more forcibly before one's mind than, perhaps, anything else the astonishing difference between

the activity of this century and the somnolence of the middle ages; a difference which one is frequently tempted to regard as something more than one of degree simply. At any rate, the acceleration of progress is very much like that which occurs when a great river, after flowing in an almost level bed, reaches a precipice. Newcastle is not the most striking example of the change that could be quoted, but its development is sufficiently remarkable. The maps of the last century show it as still a mediæval city, practically confined within the walls built by Edward I., and covering, say, a quarter of a square mile, a full third of which was taken up by gardens and open spaces. Now, Newcastle (exclusive of Gateshead) is a town of nearly 200,000 inhabitants, and covers ground measuring about three miles from east to west, and a mile from north to south. Important and prosperous as it was, its more than six centuries of life had only brought it to about one-twelfth of its present size. The interesting but insignificant little brick houses on the quay, and the picturesque but trumpery-looking timber and stucco ones in the "Sandgate" and the "Side," were the principal business premises of those days, and bear a similar proportion to the lofty, spacious, and solid stone structures of the modern city.

Though Hadrian's wall passed over the site of Newcastle, and the Romans had a fortified camp there and a bridge over the Tyne, the town really owes its foundation to William the Conqueror, at whose instigation Robert Courthose, his eldest son, founded the castle—the New Castle—around which it grew up. The site is similar to many others on which great cities have arisen—the slope of a hill facing south, with a river at the foot. The slope in this instance is very steep at the bottom, and was, no doubt, originally much steeper; and there were protecting ravines on the east; one against the castle wall, and overlooking another of which the eastern town wall was afterwards erected.\* Along the river bank is a narrow strip of low-lying land on which the quays are formed and the buildings facing them erected; but the greater part of Newcastle lies on and above the steep slope and facing the similarly-placed Gateshead, with which it is connected by several bridges, notably the remarkable two-storied one which, built on lofty stone piers, carries a high-level roadway between the girders, and the railway above them. It is not, perhaps, a very beautiful object in a strictly architectural sense; but it is an honest, straightforward piece of structural work, without any cast-iron architectural detail or silly stone mask, and, soaring as it seems to do through the air, far above the water level, it is a more than ordinarily striking object.

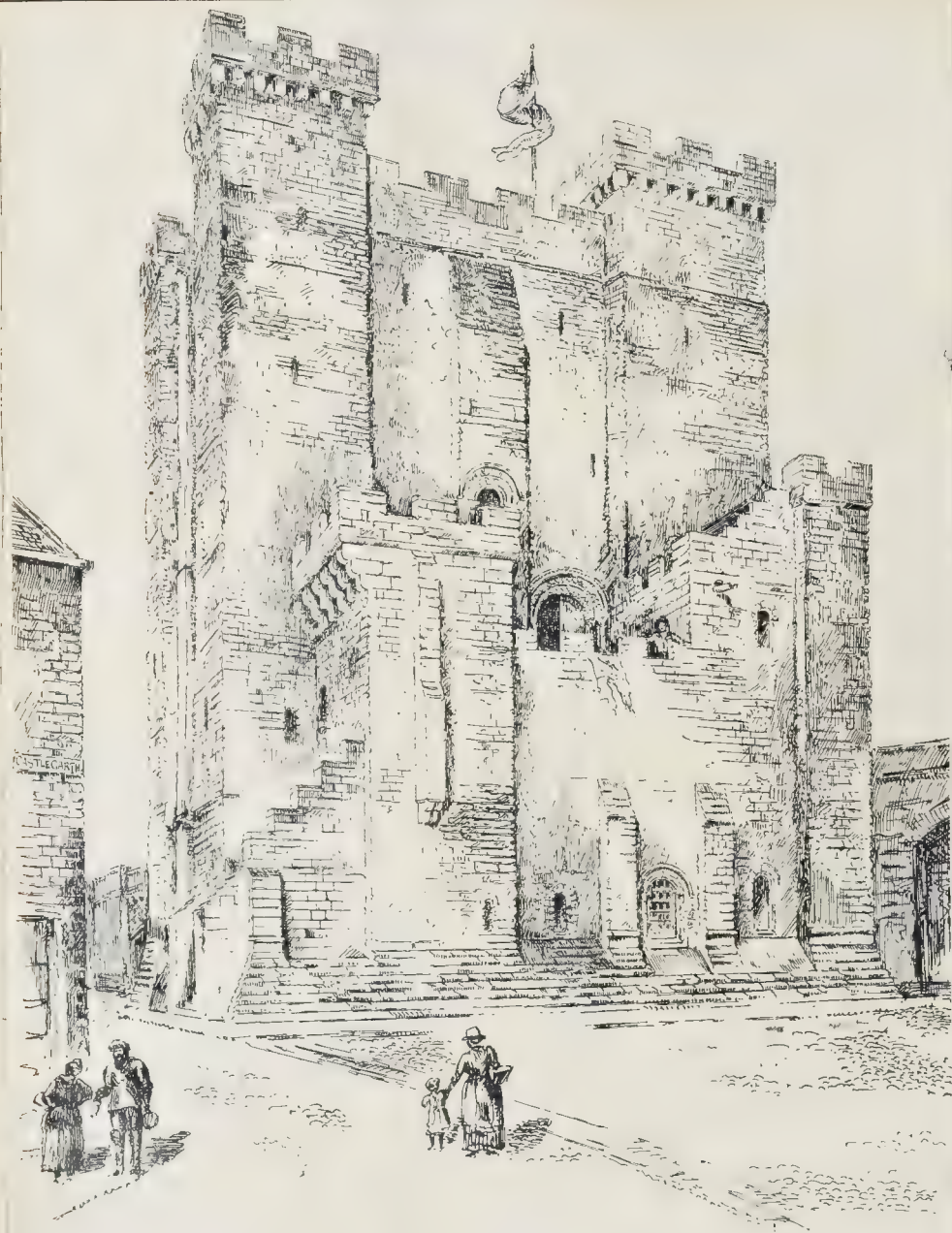
The growth of the town has been, and still is, mainly east and west—west especially. On the north side the open spaces called the Castle Leazes, the Nun's Moor,

and the Town Moor—public parks and recreation grounds—have prevented any large extension in that direction. The principal residential quarters are on the north-east side and in the western suburb of Elswick. Brick of several kinds and a coarse sandstone would appear to be, almost equally, the available local building materials. The principal modern commercial buildings of the central city are stone-faced, with but few exceptions; but the older structures, and domestic and suburban ones, are almost all of brick, with or without stone dressings, while the local sandstone is used for garden and enclosure walls and many old cottages. The common bricks are unusually pale in colour, and white bricks, similar to Suffolks, are largely used in the better class of work; but, whatever their colour, all the bricks are of large size, from 3½ in. to 3¾ in. in net thickness.\*

In considering the buildings of Newcastle in detail one may appropriately begin, as the town itself did, with the Castle. Its remains are a short distance north of the river, in the southern part of the chief business centre. They consist of the keep (Fig. 1), the lower part of the main gateway, and a fragment of the southern garth wall, containing a postern. The keep is of moderate size only, measuring externally about 60 ft. from north to south, and a little less from east to west, exclusive of the slight projection of the angle turrets and the fortified stair and platform giving access to the entrance on the east. The parapets and upper part of the turrets have been badly restored, and their present

\* This second gulch appears to have been cleverly made use of in forming the north-east railway cutting. But at the present time a third, a branch of that in which the Ouse Burn flows, having come within the area of building, is being used as a "pitch" for refuse, apparently with the idea of filling it up eventually and, probably, building upon it!

\* In this connexion it is curious to notice how burnt bricks seem to have a tendency to get thicker as the world grows older. The Roman "testæ," greatly as they varied in thickness, rarely much exceeded 1½ in.; the mediæval bricks ran about 2½ in.; in the seventeenth, eighteenth, and early part of the present century, 2½ in. was the rule; now, at any rate in the Midland and Northern counties, 3½ in. is the commonest thickness.



W. H. Knowles.  
East View  
of the Keep.

Fig. 1.—The Castle: from a Sketch by Mr. W. H. Knowles.

appearance destroys the character of the building; the buttresses in the middle of the north and south faces, which probably only reached to about half the height of the building, at any rate in their full projection, have been built up to the top; and many of the small windows have the appearance of being modern, and probably take the place of still smaller openings. There is a wide, spreading plinth, not, as is often the case, in one slope, but consisting of a series of splayed courses surmounted by a large roll moulding laboriously formed on a stone much thicker than itself. The main entrance is at the level of the third story, and is reached by a steep stairway, which passes through a fortified gateway, and is overlooked by a parapeted platform at the head. The entrance doorway is said to be a careful copy of the original, which in that case was an elaborately carved piece of Norman work of probably later date than that given for the foundation of the building. The great hall of the keep, to which this door gives access, is surrounded by the usual small chambers; the well is in the north-east turret, and the stair in the



BUSINESS PREMISES

MOSELEY'S NEWCASTLE-TYPE.

Armstrong and Knowles  
Architects, Newcastle

Fig. 2.

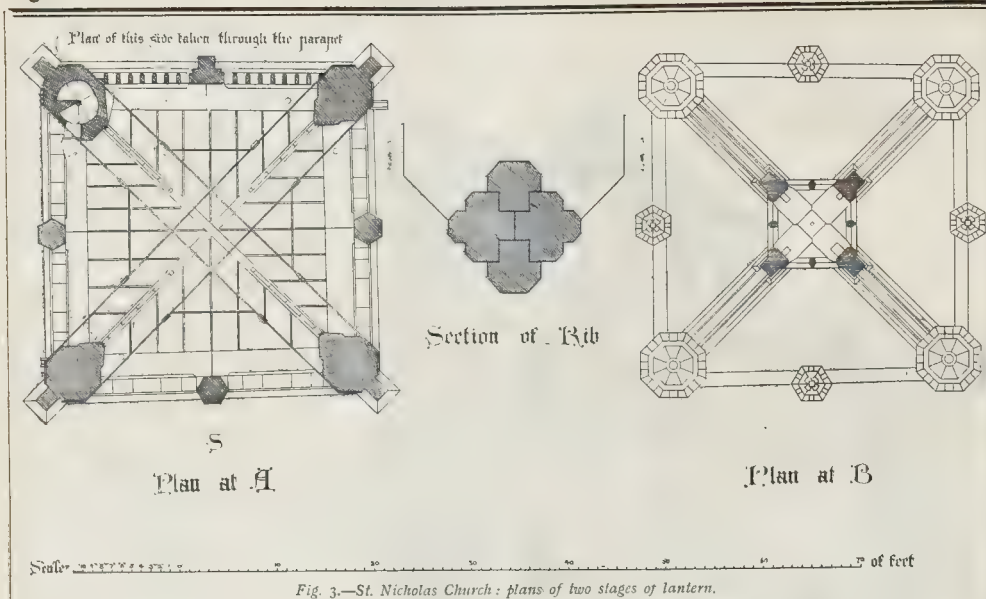
south-eastern one. The hall is now covered with a barrel vault, but was probably originally ceiled at a lower level and had another chamber over it. The bed-chamber or retiring-room has an interesting recessed fireplace which is no doubt original; the one in the hall is modern, but is surrounded by a curious carved wooden chimney-piece of the seventeenth century, from an old house in the town. The floor below the hall is now used as a library; the middle chamber has a

central column supporting two transverse arches to carry the floor above, and in the retiring chamber is another original fireplace. On the walls are hung many plans and engravings of old Newcastle. The lowest floor is perhaps the most interesting. The guard chamber is curiously vaulted from a central shaft which carries four diagonal and four transverse arches of plain section, and all semicircular (or meant to be so) the transverse ones springing, of course, at a higher level than the others. The chapel is formed beneath the entrance

stair and platform and, as usual, is an elaborately ornamented chamber. It consists of what may be called a short nave of two bays, separated by an arch from a chancel of one, rather larger, bay with a side recess. It is all covered with quadripartite vaulting on heavy moulded and carved ribs and the walls are arcaded, the arches being ornamented with rich chevrons; the planning and arrangement of this lowest floor with reference to the water supply, the sally port, and other matters, is very interesting and shows the care and prevision of our ancestors in military matters. The Keep stood within a comparatively small inner court which itself occupied the north-west corner of the greater one, the wall of which followed the outline of the hill, except upon the west, where the ground was comparatively level and where it was protected by an artificial moat. This moat returned a short distance round the north side, and between it and the steep slope of the hill at this point was the main entrance, with three successive gateways, the middle and chief of which was the structure now called the Black Gate. Its pointed arches and general appearance bear out the statement that it was built about 1247, though it has undergone various alterations since it ceased to be useful for defence. The mullioned windows, internal doorways, and fireplaces are no doubt sixteenth century insertions, and the upper part has been entirely rebuilt, while an extra arch has been turned between the buttresses which projected from the front, and on it a bay making recesses in the upper rooms has been formed. The gateway seems to have been arranged for a pair of doors within the portcullis. The masonry is rather more closely jointed than that of the Keep, but the courses are of the same height, averaging, that is, about 8 in. The upper rooms are used as a museum, and contain, besides the usual miscellaneous collection, a number of interesting Roman altars and monumental stelæ. The postern on the south is an arched gateway, about 5 ft. wide, in a wall 11 ft. thick, capable of being closed by a portcullis.

The North-Eastern Railway now passes between the Keep and the Black Gate, and crosses, on a lofty viaduct, the street called the "Side," that hugs the foot of the Castle hill on the east. The triangular space, called the "Sandhill," at the bottom of the Side, was evidently the chief business centre, as it is still an important one, of the old town. Here still stand, between it and the quay, the Exchange, or "Merchants' House," and the Guildhall, at one end of which the Watergate, probably opposite the end of the old bridge over the river, still exists in name; and in the Side and the Sandhill are still a number of old timber house fronts, with overhanging stories and ranges of windows of the whole length of the front. Most of these have an unusual appearance, from the fact that the ends of the floor timbers show instead of being cased, and, although they are great baulks of from 9 in. to 12 in. square, are set close together, and look like a row of very solid corbels. The projection of the stories is much slighter, too, than is often the case, and the long window frames being only separated by a pilaster here and there, the wall is largely composed of glass. It is not so picturesque or pleasing an arrangement as one often sees, but the long horizontal lines give considerable breadth, and the large amount of light was no doubt as much a desideratum in offices when they were built as it is at present. The picturesque Jacobean Exchange and Guildhall shown in old engravings have been cased with plain stonework; the tower has been taken down, and a one-story annexe built against the Guildhall arcade. The exterior has now no more interest than can be found in a very simple Greek Ionic portico of three quarter columns; but the upper floor inside remains much as it was. The Guildhall is a long, rather low room, with a Jacobean hammer-beam roof and a curious little clearstory gallery of small arches ornamented with





baby rustications and a heavy and rather grotesque balustrade; altogether a quaint and interesting interior. At one end of it there is a large square room, called the Merchants' Court, with a very rich, heavy, plaster ceiling, a quaint carved wooden chimney-piece, of similar date, and high, delicately-moulded oak panelling, with a very richly and deeply carved frieze and cornice. The Mayor's room, a long, low apartment beside the Guildhall, is also very interesting, with its lighter modelled ceiling and panelled walls, on which are painted views of the town as it may have been 250 years ago.

The west side of the Sandhill has been almost entirely rebuilt. There are in it six new lofty stone fronts, all of more or less merit, from the Royal Insurance Company's block at the top, by the late Mr. Parnell, which has the dignity of large scale, though some of the details are questionable, to the picturesque gables of the two narrow buildings at the other end. The most refined and pleasing of the six is the front next to the Royal Insurance; its only fault being a slight hardness in some of the carved work. Carved ornament is, however, a frequent source of failure in modern architecture, even where the rest of a design is excellent. It is to be feared that many architects leave it entirely to the carver, and that few architectural carvers are enough of artists to be so trusted. The foliage panels on the building at the south end of this row are an example of the commonest kind of fault, a lack of the emphasis of line or of contour that would give some little interest. These panels, even at quite a short distance, show only a quantity of small, neatly finished work, all of one depth and size, that would make an excellent background for ornament, but is not really ornamental in itself. In the side there are no modern buildings of much interest, but the very neat little "Crown" licensed premises, which faces the florid, heavy Gothic front of the Tyne Printing Works, is worthy of notice. At the top of Dean-street, which is also without architectural pretensions, there is Mr. Waterhouse's red stone and brick Prudential Assurance buildings; a large block, which is a strange mixture of Gothic feeling and rather heavy corbel tables, with refined classic details. There is much skill shown in proportioning the stories and drawing together the upper windows, and especially in



Fig. 4.

the way in which the first and second floors are brought together; but we think a much heavier cornice over the ground-floor windows is wanted. The refined and dignified National Provincial Bank, opposite, a design of the late John Gibson's, is the only building which we remember to have seen in which the introduction of polished red granite shafts seemed to be an improvement, by giving a touch of life without destroying the repose of the composition. The grilles in the heads of the ground-floor windows are a graceful detail, in keeping with the architecture and purpose of the building. "Mosley Chambers," next door, is a clever piece of more recent design, very carefully detailed; but there is rather too much striving for effect in it, and it wants a heavier cornice and deeper architrave to the order. The block at the corner by the old church is a fair example of Renaissance of the old-fashioned sort, with an effective crowning cornice. The little new front of the Royal Exchange Assurance, near the east end of Mosley-street, is also worthy of note.

Grey-street, the continuation of Dean-street, affords a probably unique example of a grand architectural effect resulting from the labours of the much-abused speculative builder. Its series of handsome stone buildings owe their existence to the successful carrying out of the gigantic schemes of Richard Grainger, a speculator

of the second quarter of this century, whose broad views included the employment of the best available architectural talent, thereby placing Newcastle architecture on the high level it has since on the whole well maintained. Grey-street is laid out on a curved line, and rises rather rapidly, circumstances which probably save it from the too great monotony that would otherwise have resulted from the very long frontages and similarity in design of the blocks. It was a mistake, however, under the circumstances, to design long frontages at all, for architecture of the strict classic type then in vogue does not admit of breaks in the levels without losing its unity, and the steep rise necessitates many such breaks, producing the effect of a number of separate buildings that seem as if they might just as well have had the added interest of a little more variety. The first block on the west side of the street consists of seven sections, alternately plain and ornamented with a large order of three-quarter Corinthian columns, the longest of the latter being occupied by the Bank of England (see lithograph). Opposite to this, above the rather weak little Scottish Widows' Fund premises, is a similar block with the same order in a middle section, flanked by coupled pavilions with corresponding pilasters on the angles, and, beyond them, long plain wings terminating in pavilions similar to the others but with Greek antæ



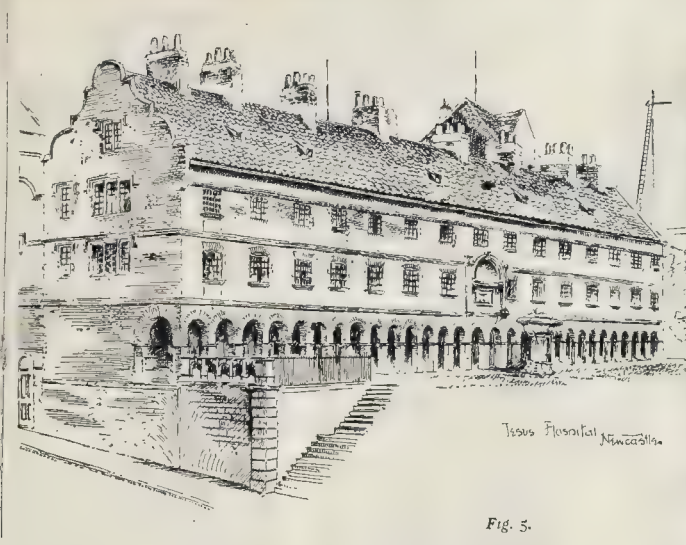


Fig. 5.



caps to the pilasters. There is a very charming little new stone shop front to Messrs. Pullar's premises in the first-named block. The upper part of the street is broken up into rather shorter frontages, especially on the east side, on which are situated the Theatre Royal and Lambton's Bank (see lithograph), while on the other side are the Royal Exchange Buildings, which have circular pavilions at the angles surmounted by domes. All these structures, including, of course, their return fronts in Shakespeare-street, Market-street, and Hood-street were erected by Grainger and designed by one of the four architects he employed—Benjamin Green, John Dobson, John Wardle, and John Walker; most of them by the first named. They are all, though varied in grouping and details, of similar character, four stories high, the lowest consisting of shop fronts and the top one an attic, with an order between, running through two stories. The theatre alone has, on its main front, an order of the whole height of the building and a pedimented portico extending over the pavement. They are not calculated as designs to satisfy any craving for originality or the picturesque, but neither are they paltry, strained, or fussy. They are the learned and self-restrained product of a time when learning and self-restraint were held in more esteem than originality; and if they do not greatly interest us, we cannot but admit their excellent qualities, and they are certainly effective in the mass. At the top of Grey-street, at its junction with Grainger-street, is the great Doric column surmounted by a statue of Earl Grey, which was erected to commemorate the passing of the Reform Act of 1832. The absurdity of such monuments is so obvious, and now so generally acknowledged, that one need not insist on it; but it is only fair to say that the position chosen for so striking an object, on the summit of the hill, facing down two long main streets, makes it an important ornament of the town that could ill be spared. All the upper part of Grainger-street is similar in its main features to Grey-street, having been also built by the man from whom it takes its name; but there is a new stone front to the ground story of the London and Midland Bank, opposite the end of Market-street, that is well worthy of notice. Nuns-street also evidently dates from Grainger's time, and shows how passable an effect may be obtained by merely a few well proportioned breaks and a good cornice.

The Bigg Market is chiefly surrounded by old brick buildings, and among the modern

and, some of them, ambitious stone fronts the only one that calls for notice is "Central Buildings," a broad gabled wall containing two large two-storied oriels, above which there is a long range of windows, separated by little columns. The detail is unfortunately not equal to the general arrangement. At the bottom of Bigg Market, between the Cloth Market and Groat Market, is the block containing the Town Hall, corporation offices, corn exchange, &c. The narrow upper end is surmounted by an ill-shaped turret, and looks altogether uninteresting; but on the broader front in Mosley-street the same rather common-place features (without the turret) have a far from bad effect, a result that seems almost entirely due to the greater breadth. The front of the Collingwood Restaurant in the Groat Market is designed in a style that seems to be a modern variation of the Elizabethan, and would be very charming if the upper part were as good as the ground story, and if the windows had stone mullions instead of thin wooden ones. Opposite to the Mosley-street front of the Town Hall is the old church of St. Nicholas, now the Cathedral, with its well-known tower surmounted by a sort of crown formed of four flying buttresses that rise from inside the lofty angle pinnacles to support a central stone lantern (see lithograph and Fig. 3). This crown was erected about the middle of the fifteenth century, and is said to be the original from which the similar ones at Edinburgh and Aberdeen were imitated; the pinnacles and parapets of the tower were no doubt re-built at the same time, if not the whole belfry stage. The body of the church, though large, consisting of a long nave and chancel with very broad aisles, transepts, and the rather unusual feature in an English church of a south chapel near the west end, is a very plain specimen of late Middle Gothic, the richest piece of old work being the lierne vault of the lowest stage in the tower. There is also a rich wooden font-cover of very late date and poorly carved, surmounting a plain, purbeck vase-shaped font—ornamented with coats of arms! The modern reredos would have been better higher and rather larger in scale, and the very rich wooden screens and bishop's throne are much better in execution than in design. In the retro-choir is a large picture ascribed to Tintoretto, and a very good modern triptych. There is a very pleasing seventeenth century building in the churchyard, chiefly used as vestries. The narrow corner building occupied by Lockhart's café, opposite the west end of the

church, is nicely designed, and the large block by the late Mr. Parnell, called High Level Buildings, though otherwise rather commonplace, acquires a great deal of character from the broad arched bays introduced near the end. Very much finer, and more effective, however, is the old Post Office, built in 1876 by Mr. J. Williams. It is a building of three bays, four stories high, with two large orders superimposed, elements which, combined with coarse detail as they are, would not usually be exceptionally pleasing; the effect seems to be due to the deep recessing of the middle bay of the two lower stories, the reduction of the lower entablature to a minimum, thus giving prominence to the crowning one, the marked treatment of the middle window over the recess, and the strengthening of the angles with heavy rustication; its lesson seems to be that style and detail are second in importance to the way in which they are used. The weak, lifeless, uninteresting, new Post Office buildings in the rear, facing Westgate-road, are a sorry contrast to the old one.

There are two large and very satisfactory buildings in Collingwood-street; Messrs. Hodgkin & Company's Bank on the south side, by the late Mr. R. J. Johnson, especially, is a composition of the highest excellence; extremely simple in its elements, depending solely on the treatment of its doorway and windows and a crowning entablature, it owes its success mainly to good proportion and detail and a judicious distribution of solids, voids, and enrichment, the latter consisting chiefly of rustication and a swag ornament in the frieze. It is not too much to say that, without being too close an imitation of any of them, it is equal in beauty to the best of the Florentine palaces on which it is founded. The Northern Assurance Company's building by the same architect (see lithograph), though not equal to the other, is also pleasing; it has a Roman Ionic pilaster order in the upper part and a good crowning cornice, the pilaster caps are heavy and not very well carved, and the rather poor dormers and one or two other weak details a little spoil it. The Wood Memorial Hall, at the corner of Neville-street, by Mr. Archibald Dunn, is designed in the now abandoned heavy French Gothic style, and is a clever piece of work of its kind, but it is interesting to note some of the difficulties the architect had to contend with in trying to adapt the style to modern requirements; how the window arches had to be filled up to get a square head, and how even then the wide spreading caps of the shafts in the jambs would overlap the window and necessitate a distortion of



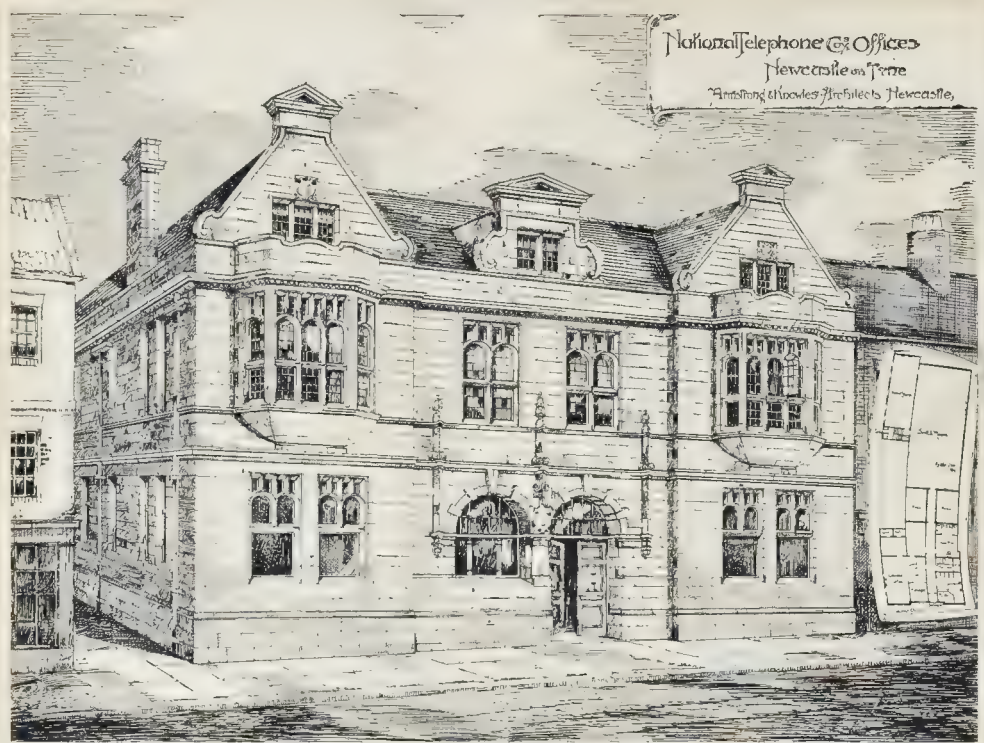


Fig. 6.

the frame, and how the wall had to be set back to get something in the shape of the supposed necessary buttresses. As far as adaptability is concerned, there is at least as much to be said for the Greek style of the little Literary and Philosophic Society's building next door. The Station Hotel is not more successful architecturally than most large hotels; but the Union Club, opposite, which was illustrated in the *Builder* some few years ago, is a very pleasing composition; it is a pity that the details of the François I. style, in which it is designed, were not more closely followed; the general handling is so skilful, one regrets the more the lack of refinement here and there. Not much can be said in favour of the statue of George Stephenson, but the quaint little gabled building facing it on the west is interesting; one wonders how the date 1856 comes to be affixed to it; it cannot be a modern design one would think. The front of the Central Railway Station is one of the great ornaments of the town; it was erected by the late John Dobson at the end of the forties in the broad, simple, and scholarly style he was accustomed to, and the long wings and end pavilions are as appropriate and effective as any railway station architecture we remember to have seen (fig. 4).

Close to the railway station, at the corner of Bewick-street, is another very successful, though smaller, building, the offices of the Tyne Improvement Commissioners, erected in 1885. It is a rectangular block of Renaissance character, with a rusticated ground story and a good cornice over the first floor, the three middle windows of which are deeply recessed and circular-headed, while those in the wings are square. It is all good work, but what gives the building character especially is probably the treatment of the attic to the wings, which is ornamented with large shields and coats of arms on the angles and between the windows. Nearly opposite

is Pugin's Roman Catholic Cathedral, a long, low, three-aisled church, with the nave and choir under one roof, and not much wider than the aisles. The roofs are of soft wood with arched principals, and look very thin and light; that over the choir is heavily painted and gilded. The detail throughout is of the Decorated period, and very carefully carried out, especially as regards the tracery of the smaller windows, which are all different, and nearly all good; the large east and west windows, the west one particularly, are poorer, and the stained glass, with which all are filled, is nearly all very bad. The stone rood screen with its marble shafts, though rather thin, is as nice as anything in the building, and is, we take it, part of the original work. The tower and spire, which are later additions, are ill-proportioned and badly detailed, which is a great pity. Pugin's work, though far beyond anything else of his time, is not so good but that a little care might have produced a steeple at least worthy of it.

The first noticeable building in the lower part of Grainger-street is St. John's Church, a plain little edifice very similar, on a smaller scale, to St. Nicholas; there are the same plan, the same thin octagonal piers with no caps, the same groined chamber under the tower, and an almost identical font cover. The church is said to date from the reign of Henry III., and there is one early capital in the north transept, but most of the recognisable detail is Perpendicular (except such as is modern). The Savings Bank opposite is a dignified little old-fashioned structure, with a rusticated ground story, and an order of pilasters above, which become Ionic columns in the middle of each face and support a pediment. The gas company's offices, to the north of the church, make a very picturesque block, with their high roofs and François I. dormers and forest of elaborate finials, and the gabled front next to them has

a great deal of character; but most of the buildings in this part of the street seem satisfied to depend on their importance and great elaboration; the best, after those already named, is, we think, the first Gothic one; its large crocketed gable does, at any rate, give it some distinction, and its detail is in character. On turning into Newgate-street one cannot quite pass over the new Empire Theatre; poor as it is in the lower part, its stepped gables and flanking turrets are not without merit; neither is the queer little Gothic revival castellated block opposite likely to escape notice. At the top of the street is St. Andrew's church, said to have been built by King David during the Scotch occupation of the town; it has a Norman chancel arch and other traces of early work, but has been so often altered and restored that its history is obscure. A part of the old town wall, including a bastion, forms the north boundary of the churchyard, which possibly accounts for the church having suffered a good deal and required much rebuilding. In the neighbourhood is Eldon-square, another of Richard Grainger's speculations; it is surrounded by very plain three-storied stone houses with slightly-projecting blocks at the corners and a lofty one in the middle of the end; the top story is an attic above a plain block, cornice. The whole quiet, simple, solid composition looks like a bit of old Bath dropped down in Northumberland. It is now on the borders of a rather poor quarter, on one side, and most of the houses have been turned into offices. A little east of the square, on the other side of Blackett-street, there is an interesting little building of about the same period with a recessed centre and Greek detail; and next to it a lofty new block, with mullioned windows and large dormers, that is well detailed and looks as if it would be a success when complete. The little old Presbyterian church opposite is a reasonably good example of revived Gothic, and there are several important new stone





Fig. 7.—Durham University Medical College, Newcastle-on-Tyne. (Messrs. Dunn & Hansom.)

buildings between this point and the top of Pilgrim-street, but most of Blackett-street is taken up with very plain brick fronts.

The Central Police-courts in Pilgrim-street is a florid, and not too successful, composition in a sort of Venetian Renaissance manner, with a large octagonal lantern. St. Andrew's Roman Catholic church behind them in Worsfold-street, is a modern Gothic structure of good Decorated detail, with one narrow aisle and a short apsidal sanctuary. Close to this is the gaol, which has a boldly and originally designed entrance gateway, with battered walls and a huge roll and cavetto cornice, rather resembling a pair of Egyptian pylons, but much spoilt by one side being pierced with windows. Nearly opposite the police-courts is the New Masonic Hall, by Mr. John Johnson: as a composition it has rather too much in it, and, although it probably looked fairly well on paper, it appears thin in execution, owing to the very slight projection of the parts. The new offices of the Water Company, and particularly the business block next to it, are excellent examples of recent Renaissance work; the former has a large Corinthian pilaster order in the upper part, with a deep ornamented frieze and good cornice; the front is pleasantly broken by little stone balconies to the second floor windows, and the dormers are cleverly treated, but the doorway is rather weak and the rusticated ground story is too thin and small in scale for the large order above. The building next door, by Mr. F. W. Rich (see lithograph), suffers even more than usual in appearance from the glass shop fronts on which the wall stands; perhaps because the upper part is so solid and good. There is no order, but the necessary windows are made the most of, being carefully proportioned and treated according to their importance, from the rich architraves and rustications of the first floor to the plain squares and circles of the top ones, a good and very original cornice surmounting the whole. Nearly opposite is a rather interesting old brick building with small projecting wings, formerly the "Queen's Head Inn" and now occupied by the Liberal Club. The Royal Arcade, facing the end of Mosley-street, another of Grainger's works, is a building of Greek detail with a Doric order to the ground story, and a Corinthian one running through the first and second, which has very beautiful caps to the columns; the upper floors are recessed between small wings and have a fine frieze and modillion cornice of unusual design, above which is a plain attic story and high balustrade—the latter very much out of keeping with the Greek details.

Near the east end of the Arcade, and now partly buried by the viaduct carrying

the City-road, is a block of seventeenth century almshouses, called the Holy Jesus Hospital (fig. 5), a three-story brick building with quaint end gables, very small windows, and a ground story set back behind an arcade of small arches formed of curious round-edged bricks: there is a very large stone fountain in front of the centre, opposite to the old wooden staircase which has a solid characteristic balustrade. The little hospital for sick children facing the almshouses is a new building of good design, but faced with red pressed bricks with black joints that give it a hard appearance. The National Telephone offices in the lower part of Pilgrim-street (fig. 6), a new red stone structure by Messrs. Armstrong & Knowles, is carefully designed, and has some interesting features, among which the double-arched entrance is the best; the lights of the principal windows are rather too wide, and suffer from being filled with large undivided sheets of glass. There are a number of old brick buildings of the late seventeenth and eighteenth century one exactly opposite, which has a wide projecting and beautifully carved wooden cornice. At the bottom of the street, on a spur of hill, in the midst of a low-lying and squalid quarter of the town, is All Saints' Church (see lithograph), a building which has several times been illustrated; it has a curious elliptical shaped nave and no chancel. It was erected in 1789 on the site of an older church which tradition asserts had succeeded a Roman pantheon. The plan is really almost circular, and with the two semicircular recesses is not unlike a Roman one; probably the tradition put it into the head of the architect to adopt so unusual a form. The tower rises to a considerable height, a circular vestibule being formed in its base and a characteristic Wren-like spire erected upon it. The detail generally is delicate and resembles the work of Adam and Wood, and it need hardly be said that the spacious interior has a rather impressive effect.

Between the shabby neighbourhood round the church and the quays are Queen-street, King-street, and Lombard-street, bordered by lofty new stone commercial buildings of imposing appearance, but mostly suffering, like similar buildings elsewhere, from the difficulty most architects find in grappling with the demand for a maximum of window, ill-judged effort to make the most of the remaining wall space by cutting it up as much as possible. The buildings in these streets are above the average of such work, but there is none that one can pick out as quite successful except the Tyne Steam Shipping

Company's offices, by the late Mr. R. J. Johnson, a composition with a small pilaster order to each story, carefully spaced mullioned windows and large dormers, that is entirely charming. The Custom House on the quays has a satisfactory little well-proportioned Classic front, but is of no great importance; between it and the Broad Chare—chare being the Newcastle equivalent for alley—is the old Trinity House, surrounded by a maze of almshouses, mostly built about the end of the eighteenth century. The entrance is used as a kind of museum, and in the Board-room and Hall, which has some good oak panelling, are a number of pictures mostly connected with naval matters, and several of them very good. The interesting fifteenth-century chapel is fitted up with Elizabethan woodwork, and its ceiling is intended to represent the underside of a ship's deck, presumably that the pensioners might feel themselves at home. There are a number of eighteenth-century brick houses about this neighbourhood, some with moulded brick and stone work about them, one, in Broad Chare, with elliptical window arches, but most are in an advanced state of dilapidation, and given over to a very poor class of inhabitants. The old Keelmen's Hospital, dated 1701, in the City-road, is hardly more presentable; one of its curious dormer gables is gone, the central turret with its sundial is stuccoed over, and the front is provided with wooden eaves, gutters, and down-spouts. It stands next to an enormous modern Board school with crows'-foot gables, which, though it could never be very ornamental, might have been greatly improved if the turret had received more careful consideration. Passing from this point towards Trafalgar-street, one passes near St. Cuthbert's Church, a new red-brick edifice of good lancet style by Mr. A. Gibson, with a tall tower surmounted by a short square spire, and a circular apse. In the choir is some very good stall-work and colour decoration, and an excellently-designed reredos by Messrs. Hicks & Charlwood.

Trafalgar-street lies close to the line of the old town wall, and just before coming to Melbourne-street, and at the corner of Carlisle-street one sees two of the bastions which have been retained, with the rather interesting little classic structures that surmount them, one of which seems to be used as a dissenting chapel. St. Peter's Church, in Oxford-street, built in 1843, is an excellent example for its date of a modern Decorated Gothic church and has a very well-proportioned tower and spire. The Public Library, in Bridge-street, is a very ornate stone building with a long front in Modern Renaissance style, with a projecting portico and a raised





Fig. 8.—Durham College of Science. (The late R. J. Johnson and Mr. F. W. Rich.)

centre consisting of a caryatide order supporting a pediment. The projecting wings, one of which is occupied by the Mechanics' Institute, do not correspond; and the whole design, though it has the dignity given by a good deal of blank wall space, is but a moderately successful piece of architecture. A little west of the Library, on the same side, there is a new business building which has some effectively designed dormers. In Northumberland-street a wall-paper maker has planted rather wildly designed, but not ineffective, wooden features on the old brick front of his premises; and Messrs. Armstrong & Knowles have no doubt done all they could to make the best of Messrs. Coates & Sons' premises—the lower part of which is all plate glass—by the use of excellent detail and putting only a row of quiet but well-designed gables to the upper part. The pilasters on the new stone front, two houses further on, are sadly spoiled for want of a little entasis. There is a group of very good buildings at the end of Northumberland-road, of which the most important is the Medical College (fig. 7), a red brick building with stone and terra-cotta dressings by Messrs. Dunn & Hansom; it is of Late Gothic design with crenellated parapets, mullioned windows, and a lofty central tower over the entrance, in the manner of the Oxford and Cambridge colleges, and is well carried out. Opposite to it is a school and master's house in Queen Anne style, which it is difficult to believe is not old work. They are built of thin bricks with stone quoins, and have wooden bays and oriels, and a heavy wooden cornice. The entrance is flanked by two little square towers with ogee roofs; the detail throughout is remarkably good, and the character preserved without a flaw. The Congregational church which stands next to the school has a large octagonal central lantern and spire, and, though rather thin and weak looking, is reasonably well detailed and a very fine piece of grouping. The Presbyterian church, opposite, is also very good, with the exception of the

belfry stage of the tower, which wants boldness. Messrs. Brady & Martin's premises, and the Pitman's Institute, in the same group are both, also, worthy of notice.

The Durham College of Science (fig. 8) in the north of the town, near the Leazes, is a very large block of building in red brick and stone, with mullioned windows of late character and Elizabethan detail, by Messrs. R. J. Johnson and F. W. Rich. It has a lofty tower over the main entrance, flanked by very prettily finished octagonal turrets, and, though comparatively plain, it would be exceedingly effective but for the undivided glass in the windows, which much injures its character. The Hancock Natural History Museum, in the same neighbourhood, is a dignified, but plain, old-fashioned edifice with an order of square piers and a plain cornice and high blocking course.

At the commencement of the Westgate-road there are several old classic buildings, including the County Court and old Assembly Rooms, and especially a building opposite the County Court, that are worthy of notice; and just beyond Clayton-street, are two new stone commercial buildings with Ionic pilaster orders, the first of which, we believe, is by Messrs. Armstrong and Knowles (see lithograph); and a very good piece of work; a little spoiled, perhaps, by its staring, polished red granite ground story, and by some rather weak carving, but with good architectural detail and pleasant proportions; the little round turret that surmounts the rounded corner is an especially charming incident. The Co-operative Printing Society's building, by Mr. Rich (see lithograph), and Rutherford College in Bath-lane, are also noticeable; the latter, though very plain generally, has some original treatment and good late Gothic character in its front. Close by Bath-lane another section of the old wall is to be seen. Beyond this there is nothing in Westgate-road of architectural interest until St. Matthew's Church is reached. This is a late Decorated Gothic building of exceptional

excellence, by the late Mr. R. J. Johnson (see lithograph), the tower being particularly good, especially the belfry stage and the graceful angle turrets surmounting it; all the detail, even where some originality is shown, is in character and carefully designed and executed. St. Mary's, Rye Hill, an older Gothic church, by the late Benjamin Green, is a cruciform Decorated Gothic edifice, with a well-proportioned tower and spire at the crossing, and is fairly well detailed for the period when it was built, though hardly interesting now. All around, and west of this church, the neighbourhood is residential, mostly consisting of small brick houses, not architecturally interesting, but pleasantly situated in wide streets and among well-kept gardens. The places of worship of various denominations are numerous, but it will suffice to mention the new Congregational Church at the corner of Elswick Park,\* an early Gothic composition of much better design and detail than most, and Messrs. Dunn & Hansom's lofty and original Roman Catholic Church of St. Michael, a cruciform building of Flowing Decorated style with a large stone octagonal lantern at the crossing (see lithograph); the detail of which is learned and the vertical character very impressive. We give illustrations of three of the Board Schools; the Royal Jubilee Board School (fig. 9), by Messrs. Dunn, Hansom, & Fenwick; the Ouseburn Schools, by Mr. Rich, and the Sandford-road School, by Messrs. Armstrong & Knowles (see lithographs). Among other buildings illustrated which we have not had space to describe specially are the two large blocks of building by Messrs. Oliver & Leeson, the Home for Incurables, by Mr. Shewbrooks, and two street fronts by the same architect; one of which, Guildhall-chambers, is an exceedingly pleasing and refined elevation.

There is so much of architectural interest in Newcastle that it is not possible to notice every building, especially in the outskirts,

\* See the Builder of the 24th ult.





Fig. 9.—Royal Jubilee Board School. (Messrs. Dunn, Hansom & Fenwick.)

that is worthy of criticism. Public, commercial, and ecclesiastical architecture are all on a high level; in domestic work alone there is a failure. Neither in Jesmond nor the Elswick quarter do we find any examples of houses or villas of more than low average merit as architecture; in this direction Newcastle architects must look to their laurels; a community that could produce and appreciate the late Mr. R. J. Johnson should be able, without much difficulty, to find a good domestic architect; and when he is found, let him be well supported, that Newcastle architecture may hold its own in all departments.

#### NOTES.

In the last issue of the "Bulletin de Corr. Hellénique" (XII, 1898, August, p. v.) M. Edmond Pottier publishes an archaic terra-cotta found in the excavations on the Acropolis at Athens, which is of considerable interest in relation to a group of seated divinities in the east frieze of the Parthenon. The terra-cotta plaque in question is one of six replicas all representing the same subject, *i.e.*, a woman seated on a *diphros*, or stool with room for two persons, her feet resting on a footstool. The design is worked in very low relief, and is in the style of the late sixth or very early fifth century B.C. The plaque is pierced with a hole for suspension, and was evidently an

*ex-voto*. Its interest consists in its close analogy to the figure usually known as Peitho in the Parthenon frieze, a figure seated next, it will be remembered, to the undoubted Aphrodite. It has been urged that Peitho (Persuasion) is too feeble and allegorical a personality to claim a place among this assembly of august Olympians. M. Pottier points out that she was from very early days the object, conjointly with Aphrodite, of a definite cultus, a cultus imported according to Pausanias by Theseus. Her sanctuary stood immediately in front of the Propylæa. The terra-cotta he believes to be one of the many *ex-votos* suspended there.

Discoveries  
at Delphi.

The same number of the "Bulletin" contains the first published account of the interesting bas-reliefs discovered in the theatre at Delphi. These bas-reliefs are sculptured in long plaques, each of which is carefully numbered or rather lettered; they must obviously have decorated the proscenium in similar fashion to the Dionysiac reliefs at the Athenian theatre. The style is late, the execution somewhat coarse; on the whole it seems likely that the reliefs were executed in the second or at latest the first century B.C., the subjects represented are the Labours of Hercules, a subject not at first sight specially appropriate to a theatre of Dionysos. It is known, however, from an inscription, that Eumenes of Pergamos gave in 159 B.C. a large sum of money to be

employed in part in the restoration and embellishment of the theatre. Pergamos boasted descent from Heracles, through Ange and Telephos. The Delphians had a feast, "Eumeneia," in the month Heracleios, and it seems highly probable that they decorated their theatre with a subject complimentary to the donor. Such is the opinion of M. Perdrizet, who publishes the account.

New Crystal  
Palace  
Company.

THE prospectus of a new Crystal Palace Company, with a capital of considerably over half a million, is to be issued in the course of the present month. The Crystal Palace has been such a valuable institution in connection with public recreation, not unmixed with instruction, that its continued existence is a subject of almost national interest, and it is to be hoped that with the new company it will enter on a new and prosperous career. If there is capital to lay out in the first instance, there is room for a great deal of initial improvement in staircases, approaches, sanitation, and putting the whole vast structure in a state of thorough repair. Among the many improvements of various kinds which might be made in the arrangement of attractions of the Palace, we would suggest that, in connexion with the more serious and intellectual class of recreations, the new company should endeavour to bring its exhibits of works of art up to a higher mark. In the art of music the Crystal Palace occupies an important position; its Satur-

\* This series of illustrated articles was begun in our issue of September 26, 1896. A list of those towns already dealt with, and particulars of future arrangements, will be found in our advertisement pages of last week.



day concerts, which arose from small beginnings, have become of European fame. The Palace had the credit of having made the first large collection of casts of antique and modern sculpture available for Londoners (though they are not grouped together as a collection); the models of architectural courts of various styles are of considerable educational value. But its occasional collections of pictures have almost always been bad, consisting generally, one may say, of pictures which it was not worth while to exhibit anywhere else. Such collections are neither of value for recreation or education. To secure some really good art-exhibitions would add an important attraction, and keep this branch of Crystal Palace culture on a level with its musical reputation.

#### Drought and Water Supply.

THE continued drought still forms the subject of vehement, apologetic, and scientific letters in the daily newspapers. The question as to what is and what is not a "water famine" especially exercises much ingenuity on the part of the writers. One remarks, rather sarcastically, that Nottingham and Leicester are not suffering from any scarcity with 19 and 20 gallons per day per head—in fact, that those cities have "abundance"—whilst in East London 25 gallons per head per day is a "water famine." Mr. Chaplin, who ought to know better, acted the part of Job's Comforter last Saturday, in a public speech reminding people that there are many parts of the country which are worse off for water than the East End—as though that could make amends for the recurring failure of the supply in that part of the metropolis. Not to be beaten, a Berkshire writer explains that he has been told that on the Oxfordshire hills people are paying for water by the pailful. Many of these writers seem to forget the one important point, so far, at least, as London is concerned. People here are called upon to pay a very heavy rate for what they do not get. They have practically no redress, as the control of the supply is not in their own hands. It has been conclusively proved that plenty of water is obtainable by those who fail to supply it, if they will only go to the expense of getting it. Instead of doing that, a patchwork compromise is suggested, which Londoners do not like, and Bills bolstering up the patchwork are, therefore, blocked. Stubborn as ever, the suppliers wait events. The inevitable comes, and the people are reminded (in a way) that the failure is their own fault. It is simply absurd to suggest that there is not enough water in England for its inhabitants—as some have maintained. The fact is that, in spite of the assertion that Nottingham and Leicester find 19 to 20 gallons per head per day "abundance," people want more and more water every year. The demands of sanitation compel this, and the natural instincts and requirements of the average citizen are in its favour. The quantity per head demanded by the Duke of Richmond's Commission—so fondly quoted by the up-to-date "authority"—must be reconsidered. The prophets have not been missing during the drought, and they have written letters enough; would they have written so much had their predictions not been fulfilled? Finally, we have the Mayor of Lyme Regis, who informs us that what Sir J. Fyner told the Sanitary Institute at Birmingham respecting the water supply to his village is

incorrect. "Our water supply," he says, "is one of the very best, if not the best," in England; and so the President of the Sanitary Institute is set at naught.

#### The Workmen's Compensation Act.

THE question which has arisen in the Liverpool County Court upon the construction of the Workmen's Compensation Act, as to whether it is necessary for a widow to take out Letters of Administration before compensation can be paid to her, is one of great interest. We think, however, that there is not really much difficulty on the point, and the County Court judge seems to have been rather hypercritical. Section 5 clearly contemplates the case of there neither being an executor nor administrator of the deceased workman. Then the compensation under the Act is to be paid "to or for the benefit of his dependants." A wife is a dependant, so, therefore, is a widow, and so she can receive some part, at any rate, of the compensation. It is only in regard to the division of the compensation that there is any difficulty. For the words which we have quoted above seem to introduce an ambiguity. If a hundred pounds is awarded to a widow and her three children there must apparently be some kind of agreement among them, or else an arbitration, unless the judge, apparently extra-judicially, can induce the family to agree to such division as he may think desirable.

#### Tests of Fire-resisting Materials.

WE are informed that "owing to the unreliability of many private and so-called exhibition tests of inventors or traders in fire-resisting materials and systems," the British Fire Prevention Committee have made arrangements for a series of tests of an entirely independent character. A suitable testing station has been obtained near Regent's Park, within easy reach of the West End, and the necessary arrangements are already being made to inaugurate the first series of tests. Systematic research work in the question of fire resistance has as yet only been commenced in the States, and the testing station in question will be the first of its kind in Europe. The preliminary arrangements have been in the hands of Mr. Edwin O. Sachs, acting for the Executive, and Mr. Frederic R. Farrow, acting for the Commercial section. The tests in each case will be undertaken by the Executive in conjunction with representatives of the Council and the general body of members, and the reports will take the form of statements of facts, supplemented by diagrams and photographs, duly attested. If this proposal is adequately carried out in a scientific manner, as we have reason to think it will be, the results ought to be of great value to architects.

#### Manchester Electric Wiring Rules.

THE revised regulations issued by the electricity department of the Manchester Corporation are worthy of the serious attention of all interested in electric lighting. The rules have evidently been most carefully prepared, and the originality displayed reflects great credit on Mr. Wordingham, the head engineer. They contain, however, an innovation in electric lighting practice, the working of which will be watched carefully by other corporations. According to the rules, no switch, fuse, fitting, or other apparatus must be used by a consumer which has not

been certified in writing by the station engineer to be of approved pattern. Consumers, therefore, must submit any new fitting they may desire to use for the approval of the engineer, and "if approved, the certificate issued will apply only to the individual article." If manufacturers wish to have their wares "approved" they must send two samples of each fitting to the Corporation works. If the tests are satisfactory the engineer issues a certificate which gives the manufacturers permission to supply fittings of exactly the same pattern for one year. If they succumb to the temptation of using this certificate for advertising purposes, or alter the design of their fittings, then we are told that the certificate will be cancelled and their wares cease to be "approved." The samples become the absolute property of the corporation, and if approved they will be kept for inspection at the electric light station. The testing and arranging of all the samples that will now come pouring into the Corporation works will entail a great deal of labour on the electrical staff, and if they intend testing glow lamps a great increase in the staff will be necessary. It will be interesting to see whether the corporation will be able to stamp out "jerry" wiring by enforcing these novel rules.

#### Workshops for Injured Workmen.

THE Municipal Council of Paris is occupied with an important scheme for organising, in the suburbs of the city, a series of special ateliers where working-men who have sustained injuries in the course of their work, which would preclude their entering again on the ordinary work on buildings or in manufactories, may find employment in which they could turn to advantage their special training as artisans. The scheme is still in an initial stage, but if successful it will no doubt be a very beneficial project and may have imitators elsewhere.

#### Memorial to Keats at Shanklin.

It is proposed to erect a memorial to Keats in the Church of St. Saviour on the Cliff at Shanklin, and the Town Council will give the name of "Keats' Green" to that part of the promenade on the cliff which extends to the "look-out." In 1819 Keats quitted "Lawn Bank," Hampstead, to join Rice at Shanklin, where, in a cottage (since demolished) near the Cliff Green, he set to work, in July, with Charles Armitage Brown on the tragedy of "Otho the Great," and began his own "Lamia."

#### Wesleyan Centenary Hall, Bishopsgate-street.

WE learn that the Trustees of the Wesleyan Centenary Hall, Bishopsgate-street, and Mission House, Bishopsgate-street Within, have finally decided to retain the present site for their new buildings to be erected at an estimated expenditure of 70,000*l.* It is proposed to let the ground floor as commercial offices, and to use the rest of the new buildings for the purposes of their home and foreign missions and various other departments. The existing hall was erected in 1838-9 to commemorate the first centenary of the Wesleyan Methodists; in 1842 was built the Missionary Society's House as a depot for missionaries' foreign outfits. The premises have a frontage of about 66 ft. and a depth of about 125 ft., covering 8,200 superficial, the classical façade rises to



height of 80 ft. Eleven years ago the trustees entered into negotiations—but the project was ultimately relinquished—for taking a site on the Victoria Embankment, and offered their Bishopsgate-street property, which is freehold, for public sale, having already refused, it is said, 200,000*l.* for it. At the auction on May 11, 1887, at the Mart, the property was bought in at 135,000*l.*, the highest bidding being for 119,100*l.*

WE have received a demand from the legal representative of the architect and the contractor concerned in this building, that we should withdraw the remarks in our issue of September 24 (page 264), as being not warranted by the facts of the case. Two statements, viz.: that the buildings were about to be pulled down, and that the foundations were giving way, appear on inquiry to be incorrect, and we regret having circulated them; but they did not originate with us; both statements were made in more than one daily paper, by which we were misled. As far as regards the contractor, we have never imputed any special blame to him; on the contrary, in our article of May 28 commenting on the evidence at the Coroner's Court (which was referred to in our Note of September 24) we said that though it seemed probable that some bad material had got into the building, there was no evidence to show that this was the case to such an extent as to cause its failure. Apart from these points, we have nothing to withdraw. The evidence in the recent case before the magistrate showed that the Surveyor of the Office of Works stated that the building "was unfit for occupation from a substantial point of view"; the District Surveyor stated that "for the safety of the public the building must be shored up," and that "he was afraid that the part of the turret between the second and third floors would give way and let the whole down"; and it is admitted that this turret (in a perfectly new building) has had to be tied round, at the requirement of the District Surveyor, with a series of steel bands over a great part of its height. Such results imply a carelessness in designing and erecting a building which is not only most reprehensible in itself, but which constitutes a grave public danger, and it is no more than our duty to speak plainly on the subject. As things now stand, the architectural arbitrator appointed at the direction of the magistrate has given orders for the work he thinks necessary for the security of the turret, and we presume it will be made safe.

#### EAST HAM PUBLIC BUILDINGS COMPETITION.

THIS competition has produced eleven sets of designs which were exhibited in the East Ham Public Hall on Monday last. Unfortunately, the conditions governing the competitors were not to be had. The scheme is a large one, comprising a Public Hall, Council Chamber, Municipal Offices, Court House, Reading and Reference Library, Librarian's house, Technical School, Swimming Bath, Sanitary Offices, and Fire Station.

The first premium has been awarded to Messrs. Cheers & Smith, of Twickenham and Blackburn. Their plan is to divide the requirements into three separate buildings and place the Librarian's house in the courtyard. The main building has a frontage to Barking-road on the north and to High-street South on the west, and consists of the public hall, council chamber, municipal offices, and court house,

against which the fire station abuts; east of this block are the library and the technical school. South are the baths and sanitary offices. The ground floor of the main building is occupied by municipal offices entered from the High-street South, and also from the courtyard on the east; entering from the High-street on the right is the Town Clerk's office and the Councilors' staircase. The hall is far too small, and is badly lit; beyond the hall is the small public hall with service accommodation on the left are the Surveyor's offices with the Accountant's department beyond, with its own entrance. The corridor is badly lit by borrowed light from the offices. The court house has a separate entrance in High-street South, and occupies the ground floor of this wing of the building. The public and prisoners' entrance are in the courtyard at the back, but are too close together. The public hall on the first floor has a separate entrance in Barking-road, reached by a flight of steps, passing lavatories and cloak-rooms, to a vestibule out of which is a corridor on the right connecting the council chamber with the public hall. The hall itself occupies the full length of the Barking-road front, and is capable of seating 1,200 persons; the platform and retiring-rooms have a separate exit at the east end of the hall. Private exits are necessary, but so many entrances are a weakness, taking the place of a grand portico or principal entrance such as one would expect in so important a building. The library and technical school is a compact building; a well-lit porch and lobby leads right and left to the reference library and reading-room and a top-lit central library with a gallery. The entrance to the technical school is in Barking-road, with lavatories and committee, needlework, and cooking rooms on the ground; the school of art, chemical laboratory, and lecture-room are on the first floor.

The engine-house and swimming-bath front west and south and are entered from the High-street. The latter is set back from the road and approached through a garden. There is a well planned entrance hall for men and another for women, with a central office with a hatchway to each hall for distribution of tickets and towels. There is no distinction of class. The bath is shown with rounded corners, a good constructional feature, but it would disqualify it from use by clubs for swimming matches or polo. On the south again of the bath are the sanitary offices, washhouses, and mortuary; the coroner's court is on the floor over.

The author has repeated the same trick which he adopted in his design in the Cardiff competition, of cutting out the elevations and mounting them on tinted paper; this pleases the public, but it cannot hide the discrepancies of a weak elevation. The materials are presumably brick, stone, and slate. There is a square tower, and a number of features that leave no impression on the mind; in the elevations the buildings look connected, in reality they are too much broken up and too fussy in detail to ever impress the public as the buildings of a large municipality.

The second premium has gone to Messrs. Spalding & Cross. Their plans are also much broken up. There are three buildings each allowing of future extension; the arrangement of the requirements is similar to that in the first design. The main block has the advantage of a fine central hall and grand staircase leading to the public hall; except for this feature the ground plan is dictated by utilitarian motives, and is used for public offices and the police-court. The police-court would have been better for the public had the entrance been nearer the court; as it is, the public would collect in the corridor before the private offices. The council chamber and offices have a well-planned staircase next the square tower at the corner of Barking-road and High-street South. The library and technical school is nicely planned. The library has a square hall top lit off which open the various reading rooms, and next the entrance, the librarian's house is cleverly contrived as part of the building. The technical school has its workshops on the ground floor and the school of art over them and the reading rooms. The swimming bath is well contrived, but the entrance arrangements are not so good as in the first design. The buildings were to be executed in red brick and stone dressings and red tiles, though not imposing and with some unsightly gables it would have formed a picturesque group.

The most dignified design sent in is by

Messrs. Baggallay, Ashley, & Armstrong; their scheme has breadth and an architectural treatment entirely lacking in the premiated designs. The first premiated design is a collection of buildings admirably adapted to the working requirements; the rest and restraint of the better proportioned design has been passed over by a public body whose requirements are so multitudinous. The block plan was so badly hung it was impossible to see the exact arrangement of the scheme. The main elevation is treated as one façade, the central part devoted to the public hall and offices on the left, the library and technical school balanced on the right by the court house and council chamber. The elevations are dignified and simple, the ground floor of the central block is a plinth on which rests the Ionic Order, whose well-proportioned cornice extends round the whole building.

Another design on symmetrical lines is that by Messrs. Lanchester, Stewart & Rickards. It has an interesting exterior, but the planning is not so good; moreover, the design depends for its effect on rather extravagant features in a tower and cupolas that would be difficult to include in the money limit.

Mr. Hatchard Smith's design looks well in perspective, but the plan is not good, and suffers from narrow, ill-lit corridors and inadequate staircases.

#### THE SANITARY INSTITUTE CONGRESS BIRMINGHAM.

THE proceedings of the three sections in connexion with this Congress commenced on Thursday last week, in Mason University College, Birmingham. Section II. (Engineering and Architecture) met in the Medical Lecture Theatre, and the President, Mr. W. Henman, delivered the address which was printed in our last issue, page 285.

On the motion of Major Lamorock Flower, seconded by Mr. Lewis Angell, a vote of thanks was accorded to the President, who briefly replied.

#### The Construction and Ventilation of House Drains.

The following paper, by Professor A. Bostock Hill, was then read by Mr. T. R. Lowcock:—

"It might at first sight be thought that a subject like this in the present state of sanitary science had been definitely settled, but as a matter of fact we find that on some points authorities still hold divergent views. The question of amount of fall, materials of pipes, &c., no doubt are agreed upon, but certain other points give rise to controversy on different forms of procedure in different districts. I have not the least intention to occupy your time by reiterating those parts of the subject upon which all are agreed, but I desire for a few moments to call attention to certain points, especially in connexion with what are known as compound drains, more particularly as this subject has had of late a local interest. This question of the relation of house drains to so-called compound drains and sewers has been forced on public attention by certain well-known decisions of the High Court; decisions given mainly to settle the point—what is a drain and what is a sewer? The subject is of importance because sewers by Section 13 of the Public Health Act are vested in the local authority, while drains, of course, are the property of the private individual.

In the past, at all events in the Midlands, it has been customary for the small contributory drains from a row of houses to join a larger one which connects with the public sewer. Most of the difficulties have arisen in cases of this kind. As regards the construction of these drains, the size and methods of disconnection and ventilation are the chief points to be considered. As to size of drains, the smallest which will convey the necessary quantity of liquid is certainly best for reasons of cleanliness. From a single house a 4-in. pipe is ample; yet I have been very surprised to find that in cases of recently-erected cottages a 6-in. pipe has been insisted upon by some surveyors, and, as far as I can understand, the only reason urged for this is the less likelihood of the pipe becoming blocked. But, even if this be true, which I take leave to doubt, there are many corresponding disadvantages. From small houses the soiled water chiefly comes down in gushes; the pipe itself, if it be as much as 6 in., is never nearly filled, but the sides get splashed, and they are in a very short time dirty, and have on their surfaces matter in a state of



putrefaction. Again, it is impossible to flush a pipe as large as 6 in. coming from a single small house, so that, although such a pipe may not become so frequently stopped up, still, it is in a condition in which sanitary science has conclusively proved a house drain should not be. It is, however, on the questions of disconnection and ventilation that the greatest differences occur. The by-laws in many towns state that every drain shall be cut off by an intercepting trap from the sewer. The judges have decided that a so-called compound drain on private property is a sewer; therefore, say certain authorities, we must insist on the presence of an intercepting trap between each of the contributory drains, and the common drain which has become a sewer.

Let us suppose for the sake of argument that legally a compound drain, though on private ground, is a sewer. As the by-laws were formulated some years previous to the legal decision, we may take it as at least doubtful whether the compound drain was intended by the sanitary advisers of those who framed the by-laws to be so considered; and we may also consider whether though legally a sewer it is desirable from a sanitary point of view, to treat it as such, as regards our methods of interception and ventilation. Let us consider this for a few moments. The object of a drain is to remove, as quickly as possible, from the neighbourhood of the dwelling, foul water which has passed into it. The law here steps in, and those who choose to consider it binding insist that at each junction of the sub-drain with the compound drain (legally a sewer) there shall be a disconnecting trap between the house drain and the compound drain, so that in a row of six houses we shall have six intercepting traps between the various sub-drains and the compound drain. Each of these traps holds a considerable quantity of liquid and solid matter, and as a trap is an obstruction to the regular flow of the liquid passing through the drain, each of these syphons becomes for the time being a small depositing tank where solids in suspension precipitate themselves. The compound drain is treated in one of two ways: either it is made to discharge into the street sewer without an intercepting trap at all, and connected with a ventilating shaft running up to the roof of one or more houses, or else an intercepting trap is put just where it enters the road, an air inlet as in the case of the other traps being provided, and a ventilating shaft being taken from it at or near its highest point. In the latter case we ventilate only that part of the sewer which is on private property. In the former case we utilise private property for the ventilation, to some extent at least, of the public sewer.

Under this system, which I regret to say is becoming common in many instances in the Midlands in new property, the following must of necessity occur. Each of the syphons on the branch drain holds foul water; in the case of the house having a water-closet, which is the rule at the present time, the trap holds fecal matter as well. The inlet which is on the drain just on the house side of the intercepting trap, and which when no water is coming down may act as such, becomes an outlet every time a flush of water is sent down, and the fouled air which the length of house drain contained, coupled with the gas which has been given off by the fouled matters in the trap, is discharged into the air in close proximity (in some instances not more than 6 ft. or 7 ft.) to the back-doors of the houses. My experience, then, is that from these so-called inlets, acting frequently as outlets, constant smells from foul gases arise, and I have had ample evidence that the tenants complain loudly of the existing state of things. The diagram which I have here shows an actual occurrence observed by a sanitary official in Birmingham, where it will be seen that the so-called inlet is being used as an outlet, while the flushing of the closet is performing the function of a bellows, and thus enabling the children of the cottages to amuse themselves by utilising the soiled air from the house-drain for the purpose of blowing up their miniature bonfire. In a close and crowded neighbourhood such a condition of things is undoubtedly bad, even if there be no specifically contaminated matter in the drains; but in the case, say, of typhoid fever existing in property drained in this way, it seems to me that even if disinfection of stools had been carried out in the best known possible way, there would be considerable risk of further dissemination of the disease. It is certainly undesirable to store the sewage even for

a short time near premises; and I am strongly of opinion that the method which I have described, while no doubt complying with the letter of the law, induces a state of things, from the sanitary point of view, very much worse than the system which it superseded. I have known of instances where, to avoid the odours arising from these so-called inlets in front of the intercepting trap, tenants have on their own account stopped up the opening, and under the circumstances, in my opinion, they are quite justified in doing so.

Closely connected with this question is that of the ventilation of drains and sewers. I have been somewhat surprised to find that many surveyors at the present time are recommending the ventilation of sewers up houses on private ground. Such a proceeding is—as, I believe, I have shown on other occasions—attended with considerable danger to health; and I wish to enter here a protest against a method which I believe to be utterly wrong in principle, and which tends to attract public attention from the real source of the nuisance, and which palliates an evil instead of removing it.

It is common knowledge that nearly all newly-laid sewers on the separate system, if they be ventilated by ventilators at the crown of the road, are, when first put into operation, a nuisance to the public. It is equally well known, I believe, that the cause of this nuisance is the stagnation of sewage, the deposition of solids in some portion of the sewer, consequent putrefaction, and the production of offensive gases, so that when a sewer gives offence to the nose it is a sign that it is not doing what it was intended to do, viz. carry fresh sewage, which in itself is always inoffensive. When this state of things occurs the public demands that the nuisance be abated. Owing to the very large number of schemes which have been completed of late in the smaller towns and rural districts these complaints have become quite common, and there has been a tendency, which I consider to be unscientific, to endeavour to remove the nuisance from the nose, instead of removing the cause which produces it.

It is no part of my subject to-day to deal with this question as it refers to public sewers, but I do wish to take this opportunity of entering my protest against some of the systems which are officially being carried out, and notably that which, instead of preventing the formation of noxious gases, tends to bottle them up, and discharge them some few feet above the roofs of private houses. I have on a previous occasion shown instances where, I believe, a system similar to this has been productive of suffering and death, and I may say that acting on my advice in a neighbouring town, for which I act as Medical Officer of Health, all ventilators of sewers up private houses have been removed by the Corporation.

It is to be regretted that in considering a question of this kind the matter should be treated as one belonging only to the department of the surveyor. In matters sanitary, as in other professional matters, no doubt there is a tendency at the present time to specialise unduly, but while it is the duty of the sanitary engineer to formulate and carry out a system for the removal of sewage and waste waters, it is no reason why the medical side of the question should be forgotten, and I maintain that this can only be definitely and properly settled by the harmonious working of medical and engineering experts. In this matter of ventilation of sewers it is no doubt comparatively easy to abate the nuisance as far as the nose is concerned, but I think in the past we have been too ready to forget the real meaning of the proverb that the remedy may be worse than the disease.

#### Combined Drainage.

The discussion on the paper was taken at the conclusion of the reading of the next paper, by Dr. Priestley, which was entitled, "Combined Drainage: Its Pros and Cons," and of which the following is an abstract.—There has recently been such difficulty in connexion with combined drains, which are "sewers" in the present state of the law, and for which the Sanitary Authority is liable as to repairing or relaying, owing to the combinations not having received at the time of construction the formal approval, sanction, order, or direction of the Sanitary Authority concerned, that there is a tendency to-day to look askance at and refuse all plans of drainage showing a combined system. Of recent years, too, Sanitary Authorities have had to expend thousands and thousands of

pounds upon combined drains, so that they felt justified in insisting upon a separate drain to each house or building. Such an extreme view is unwarranted, as all sanitarians are agreed that a first principle in drainage is to keep the drains as far as possible outside, so that, in the event of defects in connexion with the drains, no harm shall result to the occupiers by the escape of sewer or drain gas—a condition of things which may and does arise even in these days of expert drain laying, farm settlements, &c. Detached and semi-detached houses can have a separate drain to each house, the drains being kept easily outside. In the case of a row or terrace of houses, a back line of drainage can be provided, discharging into a branch sewer in a side roadway, or be turned into the sewer in the roadway in front, either through an open uncovered passage-way between two adjacent houses (and not less than 5 ft. for the width of such passage-way), or by the side of one house, or even, where necessary, through and under one of the houses. By branching each house separately into this back line of drainage all drains are kept outside, or, at the most, one house only has a drain running under and through it; whereas, if a separate drain and separate connexion into the main sewer is insisted upon, each house has to have a drain underneath and through it. How many houses ought to be allowed in a combined drain? In practice I would restrict the number to six (or less), and have the combined drain intercepted and ventilated *separately*; but with more than six houses, the main drain might be regarded as a "sewer," and treated accordingly—each house drain being separately intercepted therefrom and ventilated. In the exceptional cases, where the combined drain has to pass under a house, great care must be taken in laying the same, e.g., manhole back and front, joints absolutely air-water-tight, drain (if not iron) embedded in concrete, intercepted trap provided, &c. As to the law: in the metropolis, with which I am concerned officially, the recent case of Appleby v. the Lambeth Vestry has laid down the law very simply. Section 74 of the Metropolitan Local Management Act, 1855, allows a combined system which has, previous to laying, received the formal order of the Vestry or District Board concerned; whilst Section 17 of the Metropolitan Local Management Amendment Act of 1862, extends the powers of the previous Act beyond Vestries and District Boards (which were created in 1855) to Metropolitan Commissioners of Sewers, who came into existence in 1848. Prior to that date, all combined drains constructed are, in London, "sewers," repairable by the Sanitary Authorities—a very large order. The new Public Health (London) Act, 1891, gives no definition of drain. In districts served by the Public Health Act, 1875, a combined drain receiving the drainage of two or more houses is a "sewer," repairable by the Sanitary Authority, but the Public Health Acts Amendment Act, 1890 (Section 19 of Part I), gives the Sanitary Authority power to deal with a combined system, and to recover the expenses incurred in dealing with such combination under Section 41 of the 1875 Act. The 1890 Act is permissive. Conclusions:—(1) Where a scheme of drainage is simplified, and the drains kept outside, by means of a combined system (even in the rare case when the combined drain has to be taken through and under one house), it ought to be allowed, instead of insisting upon a separate drain and passing through and under each house—such a combined system being best hygienically, financially, or otherwise. (2) When six (or less) houses are combined, the combined drain is to be intercepted and ventilated separately as a whole, but where more than six houses join, the main drain had better be treated as a "sewer," and each house separately intercepted therefrom and ventilated—the main drain itself not being intercepted, except in the rare instance where such main drain passes through and under a house or building.

The President, in opening the discussion, said it was gratifying to him to find that those who were taking notes of sanitary matters, especially drainage, were aware of the evils of the multiplication of traps. He always condemned the "model" by-laws of the Local Government Board, which were far from model, and he hoped that the Board would discard them, and substitute new and reasonable ones for them.

The discussion was continued by Messrs. T. J. Perry (Camberwell), Close, T. Longdin (Borough



Surveyor, Warrington), and Councillor A. S. Campkin (Cambridge).

Mr. Lewis Angell said that in West Ham they had succeeded in reverting to the old condition of things—of throwing the cost of repair of private drains upon private owners. He was afraid that could not become general, except by a special Act.

Mr. S. Lowcock said that he agreed that the model by-laws of the Local Government Board should be altered, but he thought that a meeting should be held to decide what was wanted; it did not appear to be at all clear at present. He agreed that the multiplication of traps was to be avoided; but he did not think that they should all be done away with. He thought that the drains of houses should be treated in sections—say of half a dozen houses—and cut off from the sewer. The main sewer should be treated by itself and the section by itself.

Mr. E. Day (Worcester) said that some outlet for sewer gas should be provided. He favoured the use of the exhaust shaft with a destructor at the top to draw vitiated air from the sewer and destroy any microbes which might exist.

The President said he thought they had to direct attention to the fact that it was possible to prevent the formation of sewer-gas. Fresh sewage did not give off gas, but in the traps, one to every house, were many gallons of putrefying matter, which at every flush was thrown into the sewer and produced gas. From what had been said, he thought that they were over-ridden by law. He thought that the house drain should end at the boundary of the site, whatever that boundary might be, and that the rest should be public property.

In his reply, Dr. Bostock Hill said he was opposed to the adoption of the exhaust system. With the hundreds of miles of sewers there were in Birmingham it was impossible to get the necessary draught; the sewers were not air-tight, and the expense would be prohibitory. Moreover, the principle was wrong. They must prevent the formation of the gas, and the rearrangement of the sewers for that purpose was one of the greatest problems which Birmingham and other large cities had to face in the future.

Dr. Priestley also briefly replied.

#### *The Quantity of Water Required for Domestic Flushing Purposes.*

The following paper, by Dr. Charles Porter of Stockport, entitled "The Quantity of Water Required for Domestic Flushing Purposes, and the Influence of Intercepting Traps Thereof," was, in the author's absence, taken as read:—  
The water-carriage system of refuse disposal, which is yearly becoming increasingly prevalent throughout the country, aims at the cleanly and rapid removal, through drains, of excremental matter from the neighbourhood of dwellings. For its successful application and working adequate flushing of water-closets and house drains is absolutely essential, in order to prevent the latter from becoming "nothing better than elongated cesspools charged with foul festering filth," as was shown to be the case at Maidstone. The recent Government report on the typhoid epidemic in that town tells us that half its 6,000 odd houses have water-closets without any mechanical means of flushing, and that the Sanitary Authority's lamentable "failure of duty in this respect has led to the gravest consequences," a large number of the typhoid cases being officially ascribed to soil and air-pollution from blocked and defective drains. In advocating conversion to water-carriage we ought therefore to satisfy ourselves that the public health is protected from the results of such deficiencies, and with this object in view I was directed in April last by the Corporation of Stockport to ascertain experimentally the quantity of water required to efficiently flush a water-closet with drain and intercepting trap. Upwards of 120 experiments were shortly afterwards carried out on the lines adopted by the Sanitary Institute in 1893, the apparatus used being the following:—

- (a) Duckett's wash-down closet, with S-outlet, and afterwards a Unifas wash-out closet.
- (b) Water-waste-preventing cistern graduated for 6, 4, 3½, 3, 2½, 2, and 1½ gallons, and connected to closet by 5 ft. of 1½-in. vertical lead piping.
- (c) 47 ft. of glazed earthenware 6-in. and 4-in. pipe drain, with puddle joints, and having a right-angled curve one pipe's length from closet outlet. In upper surface of each length of pipe was cut a slot 15 in. to 18 in. long and about 2 in. width, for inspection purposes.
- (d) Disconnecting traps (or "interceptors")

of a good type, attached to end of drain, discharging over a weighed pail, and having glass windows inserted in the lowest part or "throat."

Faecal matter and paper, from a "Rochdale Pail," filled by actual use at a mill, were used for charging the closets, 4 ozs. to 6 ozs. being employed in most cases, but 8 ozs. and 12 ozs. were used in a smaller number. In the Sanitary Institute experiments artificial material was used for this purpose.

The First Series of trials (50 in number) were made with a 4-in. drain (fall 1 in 40) and 4-in. disconnecting trap. This trap was filled by 4 pints of water and at the lowest part measured 3½ in. transversely and 4 in. vertically. Flushes of 3, 2½, 2, and 1½ gallons were employed, the result being that 3 gallons invariably sufficed to thoroughly flush closet, drain, and 4-in. trap; a 2½-gallon flush generally failed to clear the 4-in. trap; with 2 gallons the interceptor was not once cleared, and most of the solids were left in the trap. By repeated 2-gallon flushes in rapid succession causing a head of water in the drain, the trap was eventually cleared with a rush, but this did not happen if one flush were allowed to trickle away before the next followed it. A 1½-gallon flush was found to be of little use. The drain was never cleared and became rapidly blocked.

The Second Series included twenty-one experiments, and was made with a 6-in. drain (fall 1 in 60) and 6-in. disconnecting trap, which, it is noteworthy, required 12 pints of water to fill it, and at its lowest part measured 5½ in. transversely and 5½ in. vertically. Flushes of 6, 4, 3½, 3, and 2½ gallons were used, and it is a remarkable fact that though 3 gallons and upwards sufficed to clear the closet and drain each time, the 6-in. trap was cleared by a 6-gallon flush in only 2 out of 4 cases; 4 gallons cleared it in only 1 out of 6 cases, and anything less than 4 gallons altogether repeatedly failed to clear the trap.

The Third Series numbered twenty-two experiments with a 6-in. drain and a 4-in. intercepting trap. With a 3-gallon flush the closet, drain, and trap were efficiently cleansed every time, but a flush of less than 3 gallons failed each time to clear the drain and to reach the trap.

The Fourth Series (eighteen trials) with a Unifas wash-out closet, 4-in. drain and 4-in. interceptor, flushes of 3, 2½, and 2 gallons were used; 3 gallons sufficed to clear the trap in two out of six cases. With smaller flushes, the trap retained a portion of the charge in every case; in five cases the drain was not cleared, whilst in eight the closet trap was not cleared, due evidently to the inherent faults of the wash-out closet. I shall be pleased to supply fuller details of these results to any one interested in the matter, and I venture to submit the following conclusions:—

1. That 3 gallons is the minimum amount that can be relied upon for efficient flushing, i.e., prompt carriage of dejecta through closet, drain, and interceptor to sewer, even with a good form of wash-down closet, well laid 4-in. or 6-in. drain, and good 4-in. interceptor.
2. That if an inferior type of closet be used or if the intercepting trap exceed 4 in. diameter, 3 gallons is clearly not sufficient for effective flushing. The proper remedy then, however, is to correct such structural deficiencies rather than to increase the flush.
3. That if no intercepting trap be employed a flush of 2½ gallons is the minimum amount that can be relied upon to efficiently cleanse the closet-trap and drain.
4. That the invariable employment of a disconnecting trap as recommended by the Model by-laws is far from being an unmixt benefit, and owing to the obstacle the disconnecting trap presents to the cleansing of house drains, its use should be strictly limited to those dwellings inside which a drain opening exists, e.g., in the cellar, and that if such drain-openings inside houses were prohibited in new dwellings disconnecting traps might, with great advantage, be entirely dispensed with.

There is much reason to believe that we have hitherto exaggerated the potency of sewer air; assuming, however, that it is noxious in its effects the object of a disconnecting trap is wholly gone if we keep all drain openings outside our dwellings, and, having done this, it is absurd to continue to insist on disconnecting traps which only diminish the efficiency of the flush of water.

*Is Economy in Water Effected by the Use of Waste-Water-Closets?—*In order to elucidate

this question two blocks of exactly similar houses were recently selected in Stockport. At the request and expense of the Sanitary Committee the water supplied to each block between 7 a.m. on October 28, 1896, and 7.30 a.m. on May 13, 1897, was metred by the water company, with the following results:—  
Lot A. Ten houses with waste-water-closets used 65,720 gallons, or 33½ gallons per house per day. Lot B. Fourteen houses with ordinary water-closets used 151,320 gallons, or 54½ gallons per house per day. Showing a saving of exactly 21½ gallons per house per day in slop-water houses. In a similar and more recent experiment in Manchester, the City Surveyor, Mr. T. de Courcy Meade, M.Inst.C.E., has curiously enough obtained an exactly identical result.

#### *Sewage Disposal in Connection with Tidal Estuaries.*

This was the title of a paper by Mr. H. Bertram Nichols, who gave some particulars of and statistics relating to what has been done in some of the principal seaside towns. The author showed, from a tabulated statement, that the towns on tidal waters generally discharge the crude sewage into the sea or tidal river, with the outlet at or below low water of ordinary spring tides. In several cases the sewerage schemes have been carried out many years ago, and the probability is, in some instances, if the same schemes were placed before the Local Government Board for sanction at the present time, they would be rejected in consequence of provision not being made for satisfactory treatment of the sewage before its discharge. It was always necessary that float experiments should be made to define as nearly as possible the set of the currents near the shore in connexion with sewerage schemes for all towns and districts situated on tidal waters; and it was becoming now a question as to whether it was not desirable to at least clarify the sewage before its discharge. Where the currents had a tendency to set back and leave floating matter on the foreshore some provision should be made both for storage and treatment, and the question arose as to what form the storage should take, under what system the sewage should be treated, and under what conditions it should be treated into tidal waters. Many towns adopted the method of storing the sewage in a culvert or intercepting sewer, but local conditions to a great extent affected this question, it being advisable in some cases to store the sewage in an underground storage tank. The crude sewage in most seaside towns was let out at points a little below low water on the receding tides, and the principal towns on tidal waters were so situated that the sewage was discharged and carried well out to sea before the tidal return. Clarification of the sewage was not enough where the volume of the sewage was great in comparison with the flow of a tidal river. Under such conditions it was advisable that the sewage should be specially filtered through coke breeze, clinker, or other suitable materials of sufficient area and capacity, or passed through land before final discharge. The removal of the sludge became an important factor where there was a likelihood of any sewage matter returning to the beach, and in some cases this was accomplished by interception in large catchpits before entering the outfall culvert or tank. In other cases it could be taken out to sea, as at Falmouth, where the sludge was taken by hopper into the bay. Seaside watering places and health resorts, of course, had to be particularly careful as to the point of discharge of their sewers, especially where sea-bathing was participated in, and it had become essential that the sewer outlets should be carried to low water of spring tides and to points where the currents set out to sea. The author had arrived at the following general conclusions: That only where there was a rapid seaward current was it permissible to discharge the crude sewage into tidal waters, and then only on the receding tides. Where float experiments, over a lengthened period, showed that there was a likelihood of sewage matter returning to the point of outlet, or being carried on to the foreshore, it was advisable for the sewage to be treated. In the majority of cases, clarification was all that was necessary, and this would be accomplished by precipitation in tanks, or on the biological principle as adopted at Exeter and other places. To ensure perfect immunity from danger, however, the outlets should always be carried to points where the currents tend seaward.



A discussion followed, in which the following gentlemen took part—Dr. Vacher, Messrs. Baker (President of the Clerks of Works Association, Portsmouth), Lowcock, A. J. Martin (Exeter), Moss Flower (Bristol), C. J. Jenkin (Willenhall), E. Rushton (Cleethorpes), W. J. Gilliland (Belfast), T. H. Smith (Blackpool), J. Munce (Belfast), A. S. E. Ackerman (Westminster), and the President.

Mr. Nichols having replied, and a vote of thanks having been accorded to the readers of papers, the proceedings were adjourned until Friday.

In the afternoon a Congress garden party was given by the members of the Health Committee of the Corporation at the Egbaston Botanical Gardens, and in the evening Dr. Christopher Childs lectured to the Congress in the Medical Theatre, Mason College, on the "Prevention of Pollution of our Streams and Rivers."

On Friday, the Engineering and Architecture section again met in the Medical Lecture Theatre of the College, Mr. Henman presiding.

#### Some Sanitary Defects in Rural Districts.

Mr. G. H. Smith read a paper on this subject, in the course of which he made suggestions for the remedy of the defects. He placed the difficulty of obtaining a pure water supply first. The supply, being drawn chiefly from wells and watercourses, was liable to serious pollution. It was nothing uncommon to find the well and the cesspool in close proximity, and the well consequently suffered. Rivers and watercourses were other sources of water supply in country districts which were liable to easy pollution—for instance, farmers turned streams into washing places for sheep. As a remedy for this state of things he advocated an increase of the powers of Rural Authorities. Another sanitary defect which he dealt with was the condition of many village cottages. The insanitary state of such houses arising from bad buildings and insufficient repairs was added to by sanitary conveniences of the most primitive type. Under such conditions existed many of the agricultural labourers of the country, and one wondered that they were not more subject to disease and early death. It was only their outdoor life which saved them from this. The most practical remedy was to grant power to the Parish and Rural Councils to obtain land and build cottages wherever it was considered necessary, and the money to do this should be raised on the security of the local rates. In conclusion, he contended that all inspectors of nuisances should hold certificates granted by that Institute, and, in addition, they should not be allowed to hold any other office.

Mr. A. Davenport described what had been accomplished in an essentially rural district covering about forty townships. A proper water scheme had been inaugurated by voluntary effort on the guarantees of the owners of property and of residents.

Mr. H. Denham thought there should be no distinction between the powers of Rural and Urban Authorities with relation to the water supply.

Mr. R. E. Smith (London) suggested that the dwellings difficulty might be overcome if the erection of wooden cottages was permitted.

Mr. W. Bland (Manchester) however, deprecated the relaxation of the sanitary laws so as to allow of the erection of wooden buildings by private enterprise.

Mr. J. D. Watson (Aberdeen) spoke of the Scottish experience of wooden dwellings as unsatisfactory.

The President said that matters of water supply for country places were dealt with in too small a manner. If it were compulsory for large cities drawing their water supply from a distance to make provision for the supply of water to villages on the way, the difficulty as to the water supply of those villages would be largely removed. No doubt there were districts where wooden houses might be erected, but they should always be looked upon as of a temporary character.

"The Purchase of the Catchment Areas as a means of protecting the Sources of a Public Water Supply" was a subject introduced by Dr. J. Spottiswoode Cameron (Medical Officer of Leeds). Dr. Cameron pointed out the different ways in which public water supplies might be polluted, and urged that not only should authorities have power to acquire land for water storage, but they should have similar power with regard to the gathering grounds.

Mr. Whittaker (Croydon), the Rev. Dr. Cox (Brixworth) and the President having spoken, Mr. James Mansergh, M.Inst.C.E., read a paper on the

#### Birmingham Water Scheme.

Mr. Mansergh said that the area supplied by the Water Committee amounted to 130 square miles, which was 10 per cent. in excess of the county of London. The development of the area made an increased supply absolutely necessary, and in addition the Committee had to face the possibility of increasing pollution of existing sources. The remedy seemed to be the acquiring of a distant water supply, and the prospects of abundant water and convenience of gravitation made them hit upon the Elan Valley. When they had so decided there was a necessity for prompt action, for the metropolitan authorities were searching for gathering grounds for London. For this reason they found opposition to their scheme when it came before Parliament. There was national opposition, too, for the Welshmen said that this was Welsh water, which should be reserved for Welshmen. The area of the gathering ground to be acquired was fixed after carefully marking the watershed boundaries. The observations of the rainfall on this area satisfied him that they might calculate on obtaining seventy-five million gallons per day for the supply of Birmingham, in addition to the twenty-seven million gallons required for compensation. Mr. Mansergh then described the work of damming up the watercourses so as to transform the valley into lakes, which would submerge houses, such as Shelley's, farms, and a place of worship. These storage reservoirs, he said, would hold sufficient water to provide for a drought of 180 days. From the reservoirs at Elan to the receptive reservoir at Frankley, a distance of seventy-four miles, the water will be conveyed by tunnelling, the extent of which exceeds thirty miles, cut and cover, and iron pipes, and the water will be forty-four hours in completing the journey. He then described the formation of the village for the workmen. The lecture ended with a succession of photographic views of the progress of the work, shown by means of lantern pictures.

Sir Joseph Fayer, President of the Congress, moved a vote of thanks to Mr. Mansergh for his lecture.

The President of the section seconded the motion, and it was adopted with acclamation. Mr. Mansergh briefly replied.

The concluding paper, on "Plenum Ventilation," by Dr. S. Barwise (Derbyshire), described the system of ventilating buildings by admitting fresh air towards the ceilings of rooms, and extracting the foul air by means of outlets near to the flooring—a system which has been adopted at the Birmingham Technical School and the New General Hospital. He explained the system as it has been carried out at schools at Bolsover, Derbyshire, at Leicester, and at Birmingham.

A vote of thanks having been accorded to the readers of papers, the proceedings of the section concluded. In the afternoon Mr. Henman took a party of gentlemen over the new General Hospital and explained the ventilating and warming arrangements.

The two other sections also met in Mason College on Thursday and Friday. Before Section 3 (Physics, Chemistry, and Biology) the following were some of the papers read and discussed—

"Interpretation of Results of Water Analysis," by Dr. S. Barwise; "Recent Progress in the Methods of Water Analysis," by Mr. C. E. Seyler; "Some Observations on the Natural Purification of Sewage," by Dr. H. Kenwood; "The Quality of Sewage as Influencing its Disposal," by Mr. S. Kideal; "The Biolysis of Sewage," by Mr. W. D. Scott-Moncrieff; "Bacterio-Chemical Analysis of Sewage and Sewage Effluents," by Mr. W. E. Adeney; and "The Flora of Sewage," by Professor R. Boyce.

The concluding meeting of the conference was held on Friday afternoon in the Medical Lecture theatre, Sir Joseph Fayer presiding. The Secretary (Mr. White Wallis) reported that 549 tickets had been issued to members, 886 to delegates from 431 sanitary authorities, and 400 to associates. In addition 450 complimentary and other tickets were issued, making a total of 1,979—about 50 per cent. more than the last Congress. The attendance at the sections had also been good. Reports as to the work done in the various sections were considered, and the

resolutions adopted at them passed on to the consideration of the Council.

The President then announced that the next Congress would be held at Southampton on August 30, 1899. Votes of thanks were passed to the Lord Mayor and Lady Mayoress, the Corporation, the Councils of Mason University College and the Midland Institute, to those who had shown hospitality to the local committee and secretaries, the press, and the president, and the meeting ended.

At the invitation of Alderman Baker (chairman of the Birmingham Tame and Rea District Drainage Board), a party of about one hundred members paid a visit to the sewage farm on Friday afternoon. Alderman Baker conducted the party over the works at Saltley, and thence over the farm to Tyburn, where an inspection of the buildings and the produce grown on the farm was made. Excursions were also made by parties to Dudley Castle, Whitacre, and the Croft Granite Works, near Leicester, and, on Saturday, to Stratford-on-Avon and Warwick.

In connexion with the Congress, a popular lecture was given on Friday evening in the large theatre of the Birmingham and Midland Institute, by Dr. Alexander Hill (Vice-Chancellor Cambridge University) his subject being, "Unnatural Deaths."

### Illustrations.

THE illustrations in this issue are all of buildings in Newcastle-on-Tyne, and are all referred to in our leading article of this week, which deals with the architecture of that town.

On the first sheet are given three of the most important buildings by the late Benjamin Green—buildings of the old-fashioned Classic architecture type; and three recent buildings by Mr. F. W. Rich—a printing establishment, a Board school, and a simple but very pleasing street front.

The second plate contains illustrations of the exteriors and interiors of some of the Newcastle churches.

On the third sheet are grouped some smaller buildings of various types—a Board school by Messrs. Armstrong & Knowles, the Home for Incubables, and two street façades, by Mr. Shewbrooks; and the Northern Assurance Company's Offices by the late R. J. Johnson.

The fourth sheet contains measured drawings of the famous lantern of St. Nicholas Church, lent by Messrs. Oliver & Leeson, in whose hands the church was placed some time ago for repair.

The fifth sheet contains a view of All Saints', one of the older churches of the town, and a view of premises in Westgate-road from a drawing lent by the architects, Messrs. Armstrong & Knowles.

The sixth sheet contains illustrations of two large business buildings by Messrs. Oliver & Leeson, from drawings lent by the architects.

We may take the opportunity of expressing our best thanks to the architects who have kindly lent us drawings or photographs to assist in illustrating our article.

#### HEALTH EXHIBITION, BIRMINGHAM.

THE concluding meetings and excursions of the Sanitary Congress at Birmingham took place on Saturday last, but the Health Exhibition held in connexion with the Congress will not be closed until October 22. It was opened on September 27 by the Lord Mayor of Birmingham, and may be said to be one of the most successful exhibitions ever held by the Sanitary Institute; not only are the exhibits numerous and interesting, but the attendance appears likely to be a record one. Up to Saturday last no fewer than 13,000 persons had visited the Exhibition. Bingley Hall, which has been utilised for the occasion, is undoubtedly well adapted for such a purpose as this, having a large and well-lighted area and a wide gallery extending around the four sides. Its condition prior to the exhibition appears to have been far from hygienic, but the removal of about four tons of dirt scraped from the walls and the plentiful use of Dureco on the walls and on panels of canvas fastened to the girders, have made a wonderful difference to its appearance. A word of praise is certainly due to Messrs. J. B. Orr & Co. for the admirable manner in which the decoration





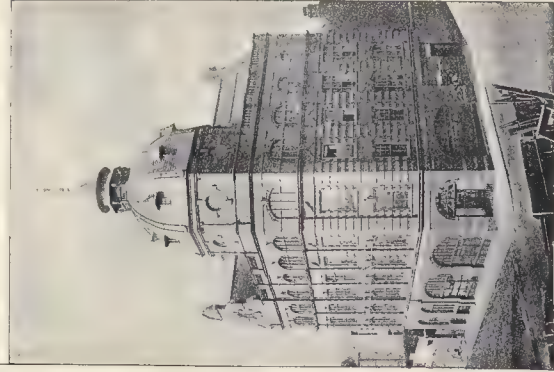
BANK OF ENGLAND (THE LATE BENJAMIN GREEN)



LAMINGTON'S BANK (THE LATE BENJAMIN GREEN)



CENTRAL EXCHANGE BUILDINGS (THE LATE BENJAMIN GREEN)



CO-OPERATIVE PRINTING SOCIETY'S PREMISES  
(MR. F. W. RICH)



THE OUSEBURN SCHOOLS (MR. F. W. RICH)



BUSINESS TRADERS' BUILDINGS  
(MR. F. W. RICH)

NEWCASTLE-ON-TYNE. 1897-1898. 1899-1900. 1901-1902. 1903-1904. 1905-1906. 1907-1908. 1909-1910. 1911-1912. 1913-1914. 1915-1916. 1917-1918. 1919-1920. 1921-1922. 1923-1924. 1925-1926. 1927-1928. 1929-1930. 1931-1932. 1933-1934. 1935-1936. 1937-1938. 1939-1940. 1941-1942. 1943-1944. 1945-1946. 1947-1948. 1949-1950. 1951-1952. 1953-1954. 1955-1956. 1957-1958. 1959-1960. 1961-1962. 1963-1964. 1965-1966. 1967-1968. 1969-1970. 1971-1972. 1973-1974. 1975-1976. 1977-1978. 1979-1980. 1981-1982. 1983-1984. 1985-1986. 1987-1988. 1989-1990. 1991-1992. 1993-1994. 1995-1996. 1997-1998. 1999-2000. 2001-2002. 2003-2004. 2005-2006. 2007-2008. 2009-2010. 2011-2012. 2013-2014. 2015-2016. 2017-2018. 2019-2020. 2021-2022. 2023-2024. 2025-2026. 2027-2028. 2029-2030. 2031-2032. 2033-2034. 2035-2036. 2037-2038. 2039-2040. 2041-2042. 2043-2044. 2045-2046. 2047-2048. 2049-2050. 2051-2052. 2053-2054. 2055-2056. 2057-2058. 2059-2060. 2061-2062. 2063-2064. 2065-2066. 2067-2068. 2069-2070. 2071-2072. 2073-2074. 2075-2076. 2077-2078. 2079-2080. 2081-2082. 2083-2084. 2085-2086. 2087-2088. 2089-2090. 2091-2092. 2093-2094. 2095-2096. 2097-2098. 2099-2100. 2101-2102. 2103-2104. 2105-2106. 2107-2108. 2109-2110. 2111-2112. 2113-2114. 2115-2116. 2117-2118. 2119-2120. 2121-2122. 2123-2124. 2125-2126. 2127-2128. 2129-2130. 2131-2132. 2133-2134. 2135-2136. 2137-2138. 2139-2140. 2141-2142. 2143-2144. 2145-2146. 2147-2148. 2149-2150. 2151-2152. 2153-2154. 2155-2156. 2157-2158. 2159-2160. 2161-2162. 2163-2164. 2165-2166. 2167-2168. 2169-2170. 2171-2172. 2173-2174. 2175-2176. 2177-2178. 2179-2180. 2181-2182. 2183-2184. 2185-2186. 2187-2188. 2189-2190. 2191-2192. 2193-2194. 2195-2196. 2197-2198. 2199-2200. 2201-2202. 2203-2204. 2205-2206. 2207-2208. 2209-2210. 2211-2212. 2213-2214. 2215-2216. 2217-2218. 2219-2220. 2221-2222. 2223-2224. 2225-2226. 2227-2228. 2229-2230. 2231-2232. 2233-2234. 2235-2236. 2237-2238. 2239-2240. 2241-2242. 2243-2244. 2245-2246. 2247-2248. 2249-2250. 2251-2252. 2253-2254. 2255-2256. 2257-2258. 2259-2260. 2261-2262. 2263-2264. 2265-2266. 2267-2268. 2269-2270. 2271-2272. 2273-2274. 2275-2276. 2277-2278. 2279-2280. 2281-2282. 2283-2284. 2285-2286. 2287-2288. 2289-2290. 2291-2292. 2293-2294. 2295-2296. 2297-2298. 2299-2300. 2301-2302. 2303-2304. 2305-2306. 2307-2308. 2309-2310. 2311-2312. 2313-2314. 2315-2316. 2317-2318. 2319-2320. 2321-2322. 2323-2324. 2325-2326. 2327-2328. 2329-2330. 2331-2332. 2333-2334. 2335-2336. 2337-2338. 2339-2340. 2341-2342. 2343-2344. 2345-2346. 2347-2348. 2349-2350. 2351-2352. 2353-2354. 2355-2356. 2357-2358. 2359-2360. 2361-2362. 2363-2364. 2365-2366. 2367-2368. 2369-2370. 2371-2372. 2373-2374. 2375-2376. 2377-2378. 2379-2380. 2381-2382. 2383-2384. 2385-2386. 2387-2388. 2389-2390. 2391-2392. 2393-2394. 2395-2396. 2397-2398. 2399-2400. 2401-2402. 2403-2404. 2405-2406. 2407-2408. 2409-2410. 2411-2412. 2413-2414. 2415-2416. 2417-2418. 2419-2420. 2421-2422. 2423-2424. 2425-2426. 2427-2428. 2429-2430. 2431-2432. 2433-2434. 2435-2436. 2437-2438. 2439-2440. 2441-2442. 2443-2444. 2445-2446. 2447-2448. 2449-2450. 2451-2452. 2453-2454. 2455-2456. 2457-2458. 2459-2460. 2461-2462. 2463-2464. 2465-2466. 2467-2468. 2469-2470. 2471-2472. 2473-2474. 2475-2476. 2477-2478. 2479-2480. 2481-2482. 2483-2484. 2485-2486. 2487-2488. 2489-2490. 2491-2492. 2493-2494. 2495-2496. 2497-2498. 2499-2500. 2501-2502. 2503-2504. 2505-2506. 2507-2508. 2509-2510. 2511-2512. 2513-2514. 2515-2516. 2517-2518. 2519-2520. 2521-2522. 2523-2524. 2525-2526. 2527-2528. 2529-2530. 2531-2532. 2533-2534. 2535-2536. 2537-2538. 2539-2540. 2541-2542. 2543-2544. 2545-2546. 2547-2548. 2549-2550. 2551-2552. 2553-2554. 2555-2556. 2557-2558. 2559-2560. 2561-2562. 2563-2564. 2565-2566. 2567-2568. 2569-2570. 2571-2572. 2573-2574. 2575-2576. 2577-2578. 2579-2580. 2581-2582. 2583-2584. 2585-2586. 2587-2588. 2589-2590. 2591-2592. 2593-2594. 2595-2596. 2597-2598. 2599-2600. 2601-2602. 2603-2604. 2605-2606. 2607-2608. 2609-2610. 2611-2612. 2613-2614. 2615-2616. 2617-2618. 2619-2620. 2621-2622. 2623-2624. 2625-2626. 2627-2628. 2629-2630. 2631-2632. 2633-2634. 2635-2636. 2637-2638. 2639-2640. 2641-2642. 2643-2644. 2645-2646. 2647-2648. 2649-2650. 2651-2652. 2653-2654. 2655-2656. 2657-2658. 2659-2660. 2661-2662. 2663-2664. 2665-2666. 2667-2668. 2669-2670. 2671-2672. 2673-2674. 2675-2676. 2677-2678. 2679-2680. 2681-2682. 2683-2684. 2685-2686. 2687-2688. 2689-2690. 2691-2692. 2693-2694. 2695-2696. 2697-2698. 2699-2700. 2701-2702. 2703-2704. 2705-2706. 2707-2708. 2709-2710. 2711-2712. 2713-2714. 2715-2716. 2717-2718. 2719-2720. 2721-2722. 2723-2724. 2725-2726. 2727-2728. 2729-2730. 2731-2732. 2733-2734. 2735-2736. 2737-2738. 2739-2740. 2741-2742. 2743-2744. 2745-2746. 2747-2748. 2749-2750. 2751-2752. 2753-2754. 2755-2756. 2757-2758. 2759-2760. 2761-2762. 2763-2764. 2765-2766. 2767-2768. 2769-2770. 2771-2772. 2773-2774. 2775-2776. 2777-2778. 2779-2780. 2781-2782. 2783-2784. 2785-2786. 2787-2788. 2789-2790. 2791-2792. 2793-2794. 2795-2796. 2797-2798. 2799-2800. 2801-2802. 2803-2804. 2805-2806. 2807-2808. 2809-2810. 2811-2812. 2813-2814. 2815-2816. 2817-2818. 2819-2820. 2821-2822. 2823-2824. 2825-2826. 2827-2828. 2829-2830. 2831-2832. 2833-2834. 2835-2836. 2837-2838. 2839-2840. 2841-2842. 2843-2844. 2845-2846. 2847-2848. 2849-2850. 2851-2852. 2853-2854. 2855-2856. 2857-2858. 2859-2860. 2861-2862. 2863-2864. 2865-2866. 2867-2868. 2869-2870. 2871-2872. 2873-2874. 2875-2876. 2877-2878. 2879-2880. 2881-2882. 2883-2884. 2885-2886. 2887-2888. 2889-2890. 2891-2892. 2893-2894. 2895-2896. 2897-2898. 2899-2900. 2901-2902. 2903-2904. 2905-2906. 2907-2908. 2909-2910. 2911-2912. 2913-2914. 2915-2916. 2917-2918. 2919-2920. 2921-2922. 2923-2924. 2925-2926. 2927-2928. 2929-2930. 2931-2932. 2933-2934. 2935-2936. 2937-2938. 2939-2940. 2941-2942. 2943-2944. 2945-2946. 2947-2948. 2949-2950. 2951-2952. 2953-2954. 2955-2956. 2957-2958. 2959-2960. 2961-2962. 2963-2964. 2965-2966. 2967-2968. 2969-2970. 2971-2972. 2973-2974. 2975-2976. 2977-2978. 2979-2980. 2981-2982. 2983-2984. 2985-2986. 2987-2988. 2989-2990. 2991-2992. 2993-2994. 2995-2996. 2997-2998. 2999-3000. 3001-3002. 3003-3004. 3005-3006. 3007-3008. 3009-3010. 3011-3012. 3013-3014. 3015-3016. 3017-3018. 3019-3020. 3021-3022. 3023-3024. 3025-3026. 3027-3028. 3029-3030. 3031-3032. 3033-3034. 3035-3036. 3037-3038. 3039-3040. 3041-3042. 3043-3044. 3045-3046. 3047-3048. 3049-3050. 3051-3052. 3053-3054. 3055-3056. 3057-3058. 3059-3060. 3061-3062. 3063-3064. 3065-3066. 3067-3068. 3069-3070. 3071-3072. 3073-3074. 3075-3076. 3077-3078. 3079-3080. 3081-3082. 3083-3084. 3085-3086. 3087-3088. 3089-3090. 3091-3092. 3093-3094. 3095-3096. 3097-3098. 3099-3100. 3101-3102. 3103-3104. 3105-3106. 3107-3108. 3109-3110. 3111-3112. 3113-3114. 3115-3116. 3117-3118. 3119-3120. 3121-3122. 3123-3124. 3125-3126. 3127-3128. 3129-3130. 3131-3132. 3133-3134. 3135-3136. 3137-3138. 3139-3140. 3141-3142. 3143-3144. 3145-3146. 3147-3148. 3149-3150. 3151-3152. 3153-3154. 3155-3156. 3157-3158. 3159-3160. 3161-3162. 3163-3164. 3165-3166. 3167-3168. 3169-3170. 3171-3172. 3173-3174. 3175-3176. 3177-3178. 3179-3180. 3181-3182. 3183-3184. 3185-3186. 3187-3188. 3189-3190. 3191-3192. 3193-3194. 3195-3196. 3197-3198. 3199-3200. 3201-3202. 3203-3204. 3205-3206. 3207-3208. 3209-3210. 3211-3212. 3213-3214. 3215-3216. 3217-3218. 3219-3220. 3221-3222. 3223-3224. 3225-3226. 3227-3228. 3229-3230. 3231-3232. 3233-3234. 3235-3236. 3237-3238. 3239-3240. 3241-3242. 3243-3244. 3245-3246. 3247-3248. 3249-3250. 3251-3252. 3253-3254. 3255-3256. 3257-3258. 3259-3260. 3261-3262. 3263-3264. 3265-3266. 3267-3268. 3269-3270. 3271-3272. 3273-3274. 3275-3276. 3277-3278. 3279-3280. 3281-3282. 3283-3284. 3285-3286. 3287-3288. 3289-3290. 3291-3292. 3293-3294. 3295-3296. 3297-3298. 3299-3300. 3301-3302. 3303-3304. 3305-3306. 3307-3308. 3309-3310. 3311-3312. 3313-3314. 3315-3316. 3317-3318. 3319-3320. 3321-3322. 3323-3324. 3325-3326. 3327-3328. 3329-3330. 3331-3332. 3333-3334. 3335-3336. 3337-3338. 3339-3340. 3341-3342. 3343-3344. 3345-3346. 3347-3348. 3349-3350. 3351-3352. 3353-3354. 3355-3356. 3357-3358. 3359-3360. 3361-3362. 3363-3364. 3365-3366. 3367-3368. 3369-3370. 3371-3372. 3373-3374. 3375-3376. 3377-3378. 3379-3380. 3381-3382. 3383-3384. 3385-3386. 3387-3388. 3389-3390. 3391-3392. 3393-3394. 3395-3396. 3397-3398. 3399-3400. 3401-3402. 3403-3404. 3405-3406. 3407-3408. 3409-3410. 3411-3412. 3413-3414. 3415-3416. 3417-3418. 3419-3420. 3421-3422. 3423-3424. 3425-3426. 3427-3428. 3429-3430. 3431-3432. 3433-3434. 3435-3436. 3437-3438. 3439-3440. 3441-3442. 3443-3444. 3445-3446. 3447-3448. 3449-3450. 3451-3452. 3453-3454. 3455-3456. 3457-3458. 3459-3460. 3461-3462. 3463-3464. 3465-3466. 3467-3468. 3469-3470. 3471-3472. 3473-3474. 3475-3476. 3477-3478. 3479-3480. 3481-3482. 3483-3484. 3485-3486. 3487-3488. 3489-3490. 3491-3492. 3493-3494. 3495-3496. 3497-3498. 3499-3500. 3501-3502. 3503-3504. 3505-3506. 3507-3508. 3509-3510. 3511-3512. 3513-3514. 3515-3516. 3517-3518. 3519-3520. 3521-3522. 3523-3524. 3525-3526. 3527-3528. 3529-3530. 3531-3532. 3533-3534. 3535-3536. 3537-3538. 3539-3540. 3541-3542. 3543-3544. 3545-3546. 3547-3548. 3549-3550. 3551-3552. 3553-3554. 3555-3556. 3557-3558. 3559-3560. 3561-3562. 3563-3564. 3565-3566. 3567-3568. 3569-3570. 3571-3572. 3573-3574. 3575-3576. 3577-3578. 3579-3580. 3581-3582. 3583-3584. 3585-3586. 3587-3588. 3589-3590. 3591-3592. 3593-3594. 3595-3596. 3597-3598. 3599-3600. 3601-3602. 3603-3604. 3605-3606. 3607-3608. 3609-3610. 3611-3612. 3613-3614. 3615-3616. 3617-3618. 3619-3620. 3621-3622. 3623-3624. 3625-3626. 3627-3628. 3629-3630. 3631-3632. 3633-3634. 3635-3636. 3637-3638. 3639-3640. 3641-3642. 3643-3644. 3645-3646. 3647-3648. 3649-3650. 3651-3652. 3653-3654. 3655-3656. 3657-3658. 3659-3660. 3661-3662. 3663-3664. 3665-3666. 3667-3668. 3669-3670. 3671-3672. 3673-3674. 3675-3676. 3677-3678. 3679-3680. 3681-3682. 3683-3684. 3685-3686. 3687-3688. 3689-3690. 3691-3692. 3693-3694. 3695-3696. 3697-3698. 3699-3700. 3701-3702. 3703-3704. 3705-3706. 3707-3708. 3709-3710. 3711-3712. 3713-3714. 3715-3716. 3717-3718. 3719-3720. 3721-3722. 3723-3724. 3725-3726. 3727-3728. 3729-3730. 3731-3732. 3733-3734. 3735-3736. 3737-3738. 3739-3740. 3741-3742. 3743-3744. 3745-3746. 3747-3748. 3749-3750. 3751-3752. 3753-3754. 3755-3756. 3757-3758. 3759-3760. 3761-3762. 3763-3764. 3765-3766. 3767-3768. 3769-3770. 3771-3772. 3773-3774. 3775-3776. 3777-3778. 3779-3780. 3781-3782. 3783-3784. 3785-3786. 3787-3788. 3789-3790. 3791-3792. 3793-3794. 3795-3796. 3797-3798. 3799-3800. 3801-3802. 3803-3804. 3805-3806. 3807-3808. 3809-3810. 3811-3812. 3813-3814. 3815-3816. 3817-3818. 3819-3820. 3821-3822. 3823-3824. 3825-3826. 3827-3828. 3829-3830. 3831-3832. 3833-3834. 3835-3836. 3837-3838. 3839-3840. 3841-3842. 3843-3844. 3845-3846. 3847-3848. 3849-3850. 3851-3852. 3853-3854. 3855-3856. 3857-3858. 3859-3860. 3861-3862. 3863-3864. 3865-3866. 3867-3868. 3869-3870. 3871-3872. 3873-3874. 3875-3876. 3877-3878. 3879-3880. 3881-3882. 3883-3884. 3885-3886. 3887-3888. 3889-3890. 3891-3892. 3893-3894. 3895-3896. 3897-3898. 3899-3900. 3901-3902. 3903-3904. 3905-3906. 3907-3908. 3909-3910. 3911-3912. 3913-3914. 3915-3916. 3917-3918. 3919-3920. 3921-3922. 3923-3924. 3925-3926. 3927-3928. 3929-3930. 3931-3932. 3933-3934. 3935-3936. 3937-3938. 3939-3940. 3941-3942. 3943-3944. 3945-3946. 3947-3948. 3949-3950. 3951-3952. 3953-3954. 3955-3956. 3957-3958. 3959-3960. 3961-3962. 3963-3964. 3965-3966. 3967-3968. 3969-3970. 3971-3972. 3973-3974. 3975-3976. 3977-3978. 3979-3980. 3981-3982. 3983-3984. 3985-3986. 3987-3988. 3989-3990. 3991-3992. 3993-3994. 3995-3996. 3997-3998. 3999-4000. 4001-4002. 4003-4004. 4005-4006. 4007-4008. 4009-4010. 4011-4012. 4013-4014. 4015-4016. 4017-4







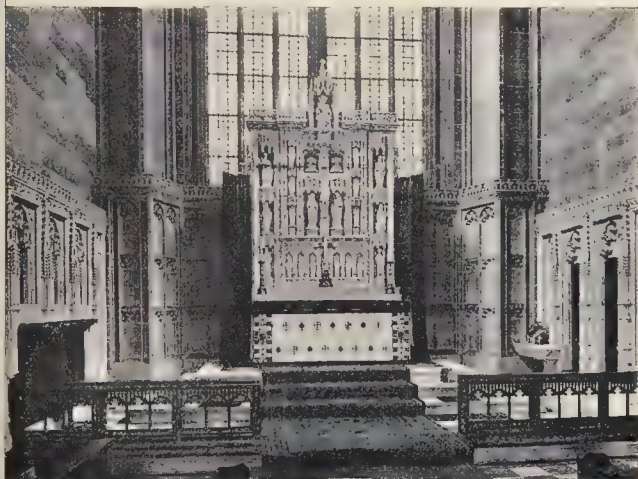
ST. MATTHEW'S CHURCH TOWER (MESSRS. HICKS & CHAPPELWOOD)



THE LANTERN, ST. NICHOLAS.



ST. MICHAEL'S, WESTMORELAND ROAD (MESSRS. HICKS & CHAPPELWOOD)



ST. MATTHEW'S CHURCH: CHANCEL AND REREDOS (MESSRS. HICKS & CHAPPELWOOD)



ST. MARY'S CHURCH: REREDOS (MESSRS. HICKS & CHAPPELWOOD)



ST. MATTHEW'S CHURCH, NAVE LOOKING EAST (MESSRS. HICKS & CHAPPELWOOD)







SANDYFORD ROAD BOARD SCHOOL (MESSRS. ARMSTRONG & KNOWLES)



HOME FOR INCURABLES (MR. F. SHAWBROOK)



BUSINESS PREMISES, NEWGATE STREET (MR. F. SHAWBROOK)



NORTHERN ASSURANCE COMPANY'S OFFICES (THE LATE R. J. JOHNSON)



GUILDHALL CHAMBERS (MR. F. SHAWBROOK)

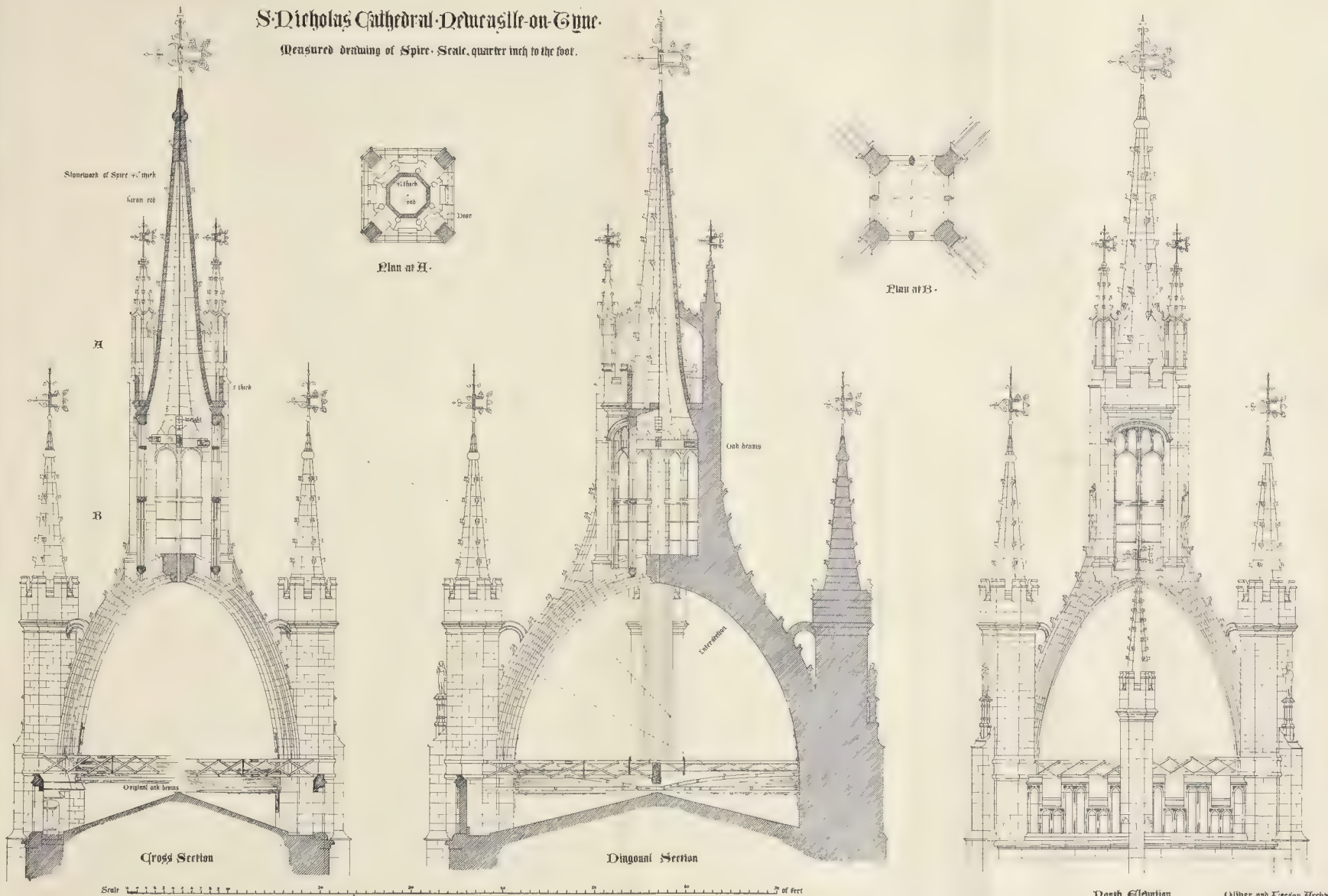
PHOTOGRAPHED BY J. & A. S. EAST, 40, NEW STREET, LONDON, E.C. 4





# S. Nicholas Cathedral, Newcastle-on-Tyne.

Measured drawing of Spire. Scale, quarter inch to the foot.

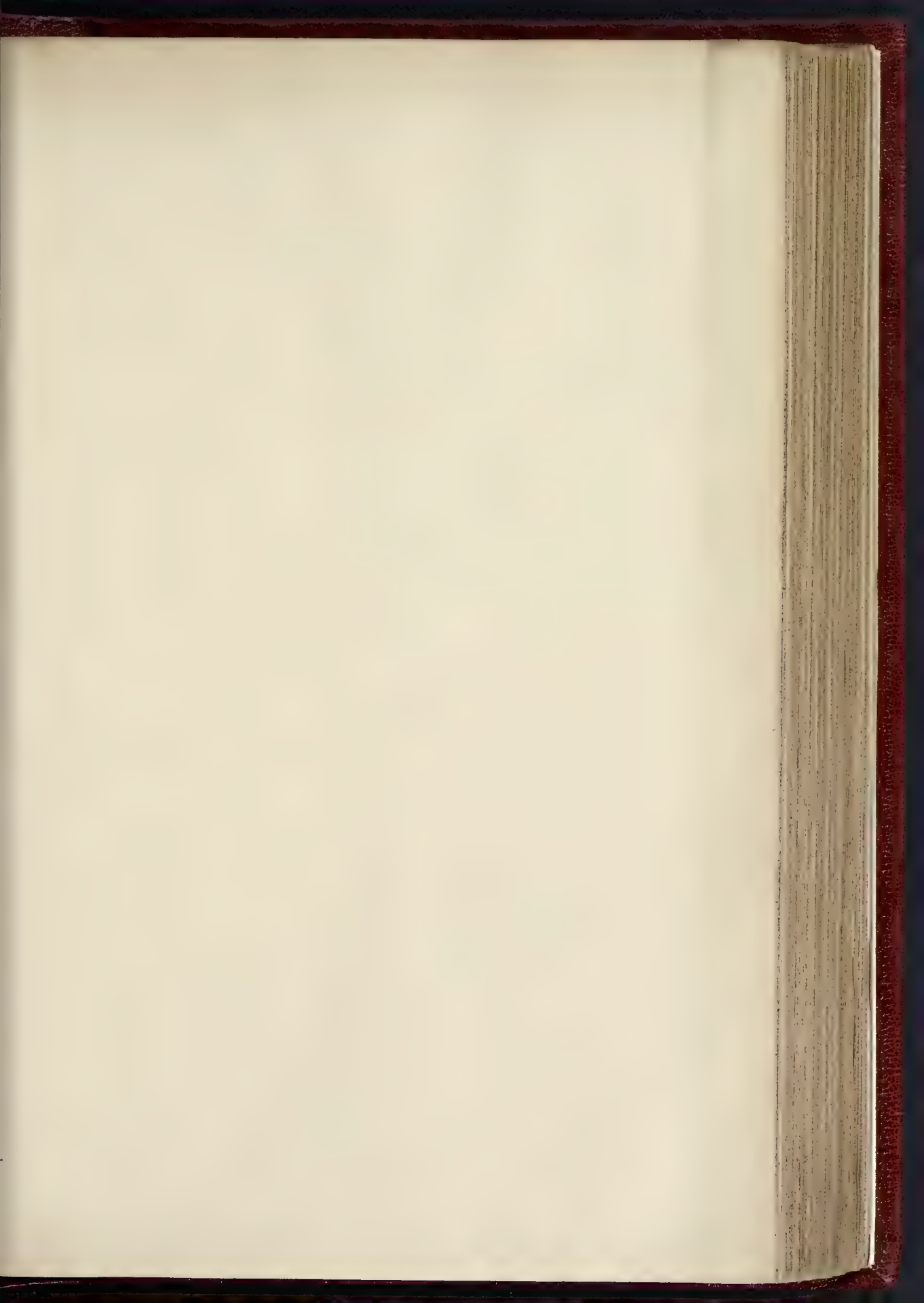


North Elevation

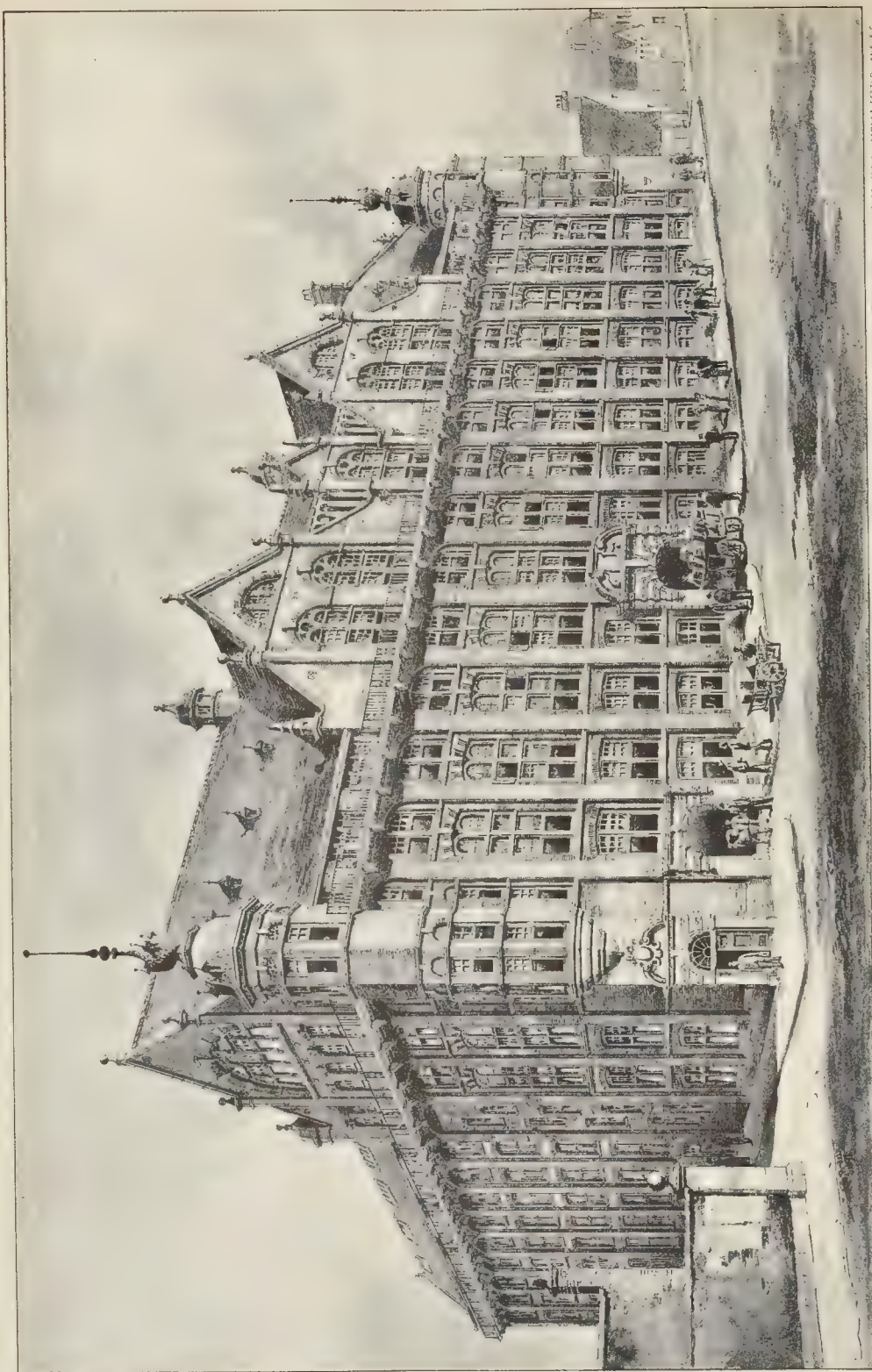
Older and Erection Hitherto  
Newcastle on Tyne  
Oct 1895.





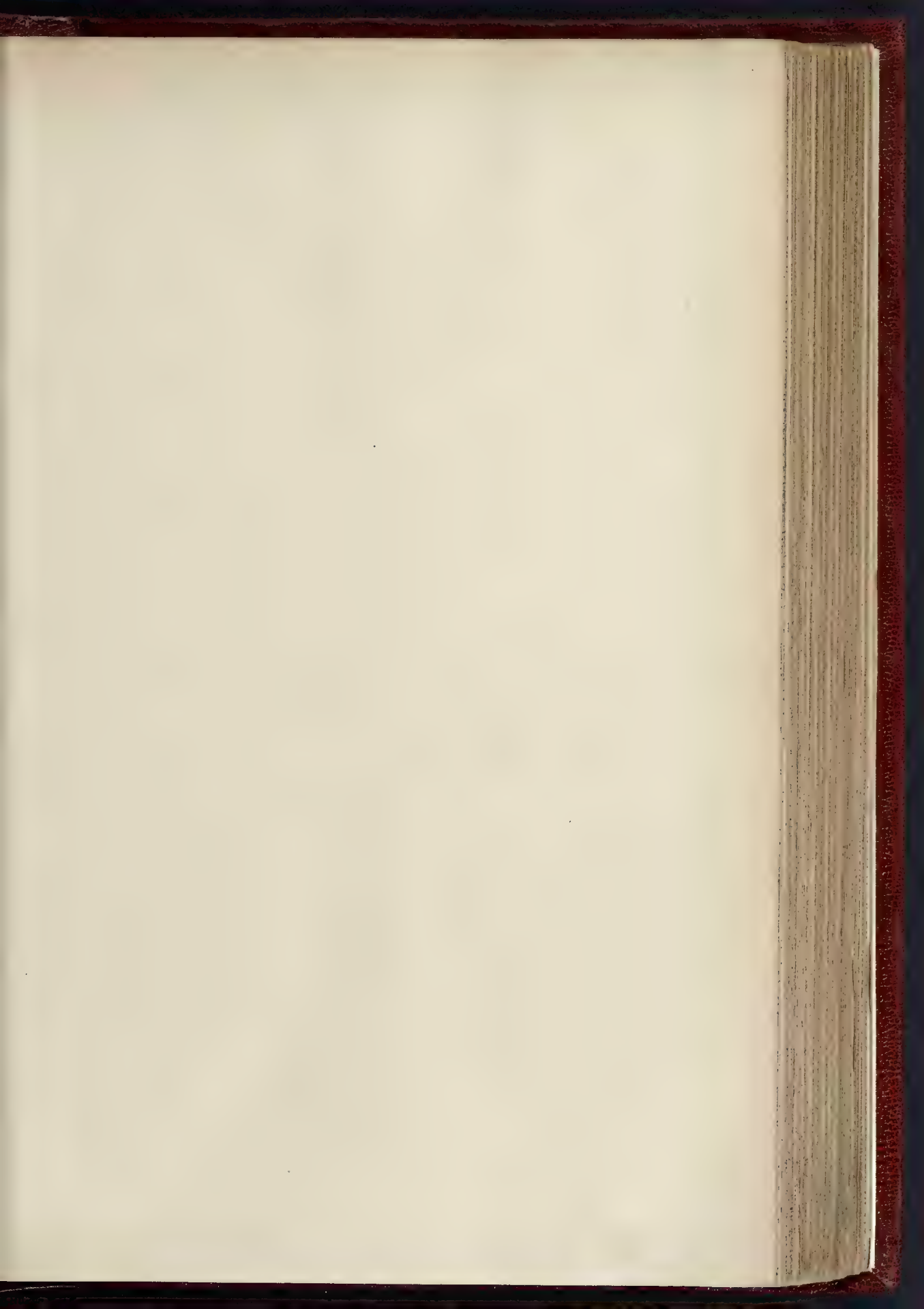


THE BUILDER, OCTOBER 8, 1898.

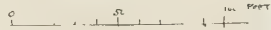
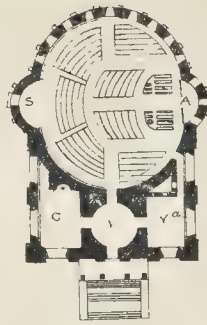


CO-OPERATIVE WHOLESALE SOCIETY'S NEW OFFICES, WAREHOUSES, AND CONFERENCE HALL, BLANDFORD STREET (MESSRS. OLIVER & LEE, ARCHT.)





S staircase to  
Gallery  
A. Altar.  
C. Chapel.  
V Vestibule.  
V<sup>a</sup> Vestry.



# ALL SAINTS CHURCH NEWCASTLE UPON TYNE

Erected. 1786-96. at a cost of £27,000  
David Stephenson, Architect.



PHOTO L. THO. SPRAGUE & CO. L. 4 & 5 EAST HARRISON STREET FETTER LANE E.C.



BUSINESS PREMISES, WESTGATE ROAD, NEWCASTLE-ON-TYNE. *Armstrong & Knowles*  
*Arch<sup>ts</sup> Newcastle.*



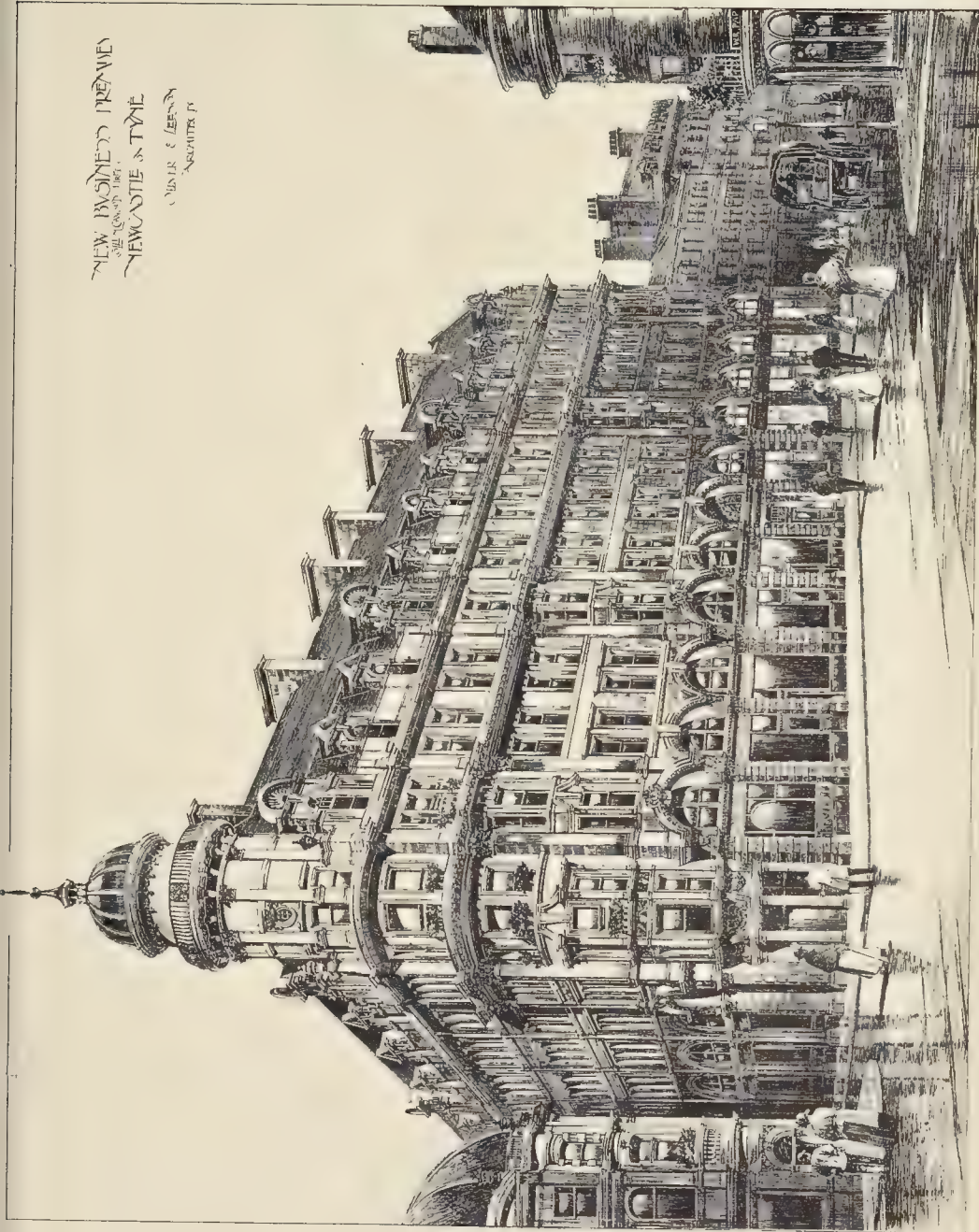
PHOTO LITHO SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ARCHITECTURE OF NEWCASTLE-ON-TYNE.





NEW BUSINESS PREMISES  
 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000



ARCHITECTURE OF NEWCASTLE ON-TYNE

PHOTOGRAPH BY J. P. B. & CO. LONDON





of the hall has been carried out; some of the stencilled designs are excellent, and have been specially prepared for the positions they occupy in the hall.

Considerable care has been exercised in the location of the various exhibits, a rough classification having been made, which is of great convenience to the visitor. The exhibits are ranged alongside ten aisles, and, speaking broadly, the right-hand half of the hall is occupied by sanitary appliances, and the remaining half of the area and the whole of the galleries by miscellaneous exhibits. In the first aisle, commencing at the right hand side of the area, we find the most important stands of sanitary fittings, the names of Shanks & Co., George Jennings, Doulton & Co., and Thomas Wragg & Sons, being among the more prominent. The next aisle includes somewhat similar exhibits by Twyford, Adams & Co., George Skye & Co., and others, together with a number of drainage appliances. The principal stands in the third and fourth aisles are those of Burn Bros., Hughes & Lancaster, J. Duckett & Son, and Oates & Green. Beyond these aisles there is little of interest to the architect or builder until the ninth and tenth are reached. In these are important exhibits of water-filtration and sterilisation apparatus by J. DeRIES & Sons, James Edmund Webb, and Maiche. A number of valuable drawings have been lent by the Corporation of Manchester, Mr. William Henman, and others, but these are scattered about in so many places that it is almost impossible to obtain any connected idea of their teaching. We had the opportunity of pointing out this defect to the courteous curator of the exhibition, Mr. W. H. Knight—who, by the way, is also the curator of the Parkes Museum in Margaret-street, London—and at the same time we suggested that a special space should be reserved in future exhibitions for drawings, and an attempt be made to obtain series of designs illustrating buildings in which sanitary requirements have been carefully studied. In this way valuable information might be imparted respecting hospitals, infirmaries, workhouses, lodging-houses, workmen's dwellings, and other buildings. A department of this kind would undoubtedly stimulate the interest of architects and architectural students.

As the general classification of the exhibits is so well done, it is, however, almost hypercritical to find fault about the placing of the comparatively small number of drawings. We cannot but congratulate Mr. Knight on the success which he has attained in the general arrangements of the exhibition, which is certainly the best of the Sanitary Institute's exhibitions it has been our lot to visit.

At Stall No. 1 Mr. Wm. Eggington, of Birmingham, exhibits a model of his "Portable sewer-gas extractor and destroyer in conjunction with sewer-disinfectant." The apparatus includes a fan, which is designed to draw the air from the sewer into a chamber, and thence through a breeze fire; for disinfecting the sewer sulphur fumes are drawn through it. It is claimed that a mile of ordinary sewers can be treated at one operation, but only actual trial over a lengthened period will show whether the inventor's claims are likely to be substantiated in practice. The use of the apparatus would, of course, necessitate the closing of the sewer-ventilators in the district tested, which is not at all an undesirable summation if adequate ventilation can be obtained in some other way. To say the least, Mr. Eggington's apparatus deserves a trial, but we are not sanguine that it will be generally adopted.

The next stall is that of Messrs. Shanks & Co., and is perhaps the best-arranged in the exhibition. It is not crowded, and everything has an air of cleanliness and quality. Bronze medals have been awarded to this firm for their "Perfecto" bath and "Perfecto" lavatory. The bath is of porcelain-enamelled iron, white inside and white and gold outside. The overflow is the special feature, being quite vertical and straight and of rather large area, so as to facilitate cleaning; the upper part of the foot of the bath is slayed back, and the overflow extends vertically downwards from this slay. The waste-valve is at the foot of the bath, and is of large area, so that the bath can be rapidly emptied. A hinged, nickel-plated grate, shaped like a quarter of a sphere, is provided to prevent soap and brushes being drawn into the trap and waste-

pipe. A beautiful lavatory, with nickel-plated supports and fittings and onyx top, is shown, this also being provided with an easily-cleanable overflow. The "Victorian" hospital sink and bed-pan washer is an improvement of that exhibited at Leeds last year; it consists of a large hopper of white enamelled fireclay, a hinged grid of brass, covered with vulcanite for receiving the bed-pans, a spray and jet forming part of the grid, two sets of taps for hot and cold water, and a three-gallon cistern, which is operated by pressing a button. A new water-closet seat is shown, consisting of a perforated steel frame covered on both sides with vulcanite, which forms a smooth and easily-washed surface; the perforations in the frame are merely to afford a key for the vulcanite. Among other exhibits may be mentioned a silent cistern known as the "Aqua-jet," and a range of two "Odourless" urinals with fireclay cistern. The "Lanyon" closet, designed by Mr. Lanyon, the Belfast architect, possesses some features of interest; it is of the wash-down type with a large water-area measuring about 11 in. by 6 in., and the rim of the basin is about 3 in. wide, the top surface being made to slope inwards so as to prevent splashing over; the seat is specially designed to prevent fouling and the communication of infectious diseases.

Stall No. 3 is occupied by the exhibits of Mr. George Jennings, and is well worth careful examination. The "Duplex Supply and Sanitary Waste-Valve" for baths has been selected by the judges "for further practical trial"; the arrangement for asylums is possessed of considerable merit. The valves or taps are placed under a flat plate of brass level with the top of the bath; in the plate are two dials, that for the water supply being marked off hot and cold, and that for the waste being marked open and shut; each dial can be actuated by a removable key, and not otherwise. Both the supply and discharge are very rapid. The chief feature of Jennings' hospital sink and bed-pan washer is a small chamber, fitted in front with a glazed circular door like the window of a port-hole; in this chamber the bed-pan is placed and washed without fouling the air of the room. The ventilation pipe from the chamber would be all the better for being a little larger; a 3-in. pipe cannot be very efficient. The "Hyback" combined closet and urinal will be of service in railway carriages and ships, as well as in a certain class of public houses. As the name implies, the basin is carried up at the back so as to render it more serviceable as a urinal, while the seat is of horseshoe shape pivoted in the middle, the extended portions at the back being weighted so that the seat, when not in use, remains in a vertical position. At this stall we saw also the "closet of the century," which is a syphonic closet with valve-supply, which can be regulated to give a flush of from two to three gallons. Riker's lavatory is exhibited here; it is of American manufacture, and is noteworthy for the ease with which it can be fixed and removed. It has an iron frame at the back built into the wall, and to this the upper and lower marble back-pieces, the marble slab, and the porcelain basin are screwed; it is provided with a syphonic waste and two swing towel-rails, and may be praised for its compactness and ingenuity. Stoneware conduits for electric wires are shown by Mr. Jennings, their special advantage consisting in the pair of longitudinal grooves formed on opposite sides of each tube. When it is desired to make a connexion with the wires in the conduit, a chisel is placed in the groove and one or two light taps with a hammer suffice to remove the upper half of the conduit; the connexion can then be made and a junction piece inserted in place of the part removed. Sockets for the blind ends of junctions in drains and sewers are also made with a grooved cap, which can be cut off in the same way when it is required to make a connexion with the junction. Mention should be made of the Louis Quatorze lavatory, which is undoubtedly the best-designed sanitary fitting in the Exhibition from an architectural point of view. It has a white marble slab, 4 ft. by 2 ft. 4 in., supported on brass legs and frame, and above the slab is a marble shelf on brass supports. The fittings are of brass, and include a shampooing supply.

Messrs. Doulton & Co.'s exhibits are at Stalls Nos. 4 and 13, which are on opposite sides of the aisle. The "Waverley" lavatory and two baths are fitted with nickel-plated standing

wastes and overflows, which are simply hung to the spindles of the waste-knobs and can be easily detached for cleaning. The "Simplicitas" wash-down closet has a water-area only 4½ in. in diameter, while that in the "Simplicitas" large water-area" closet only measures about 6 in. by 5 in. Among the well-known decorative work of this firm we noticed an effective panel representing Autumn and Winter, but a green mantel with blue hearth was not soothing.

At Stalls Nos. 5 and 12, Messrs. Thomas Wragg & Sons show a great many drain-traps and gullies, some of good design, but not very novel. Hassall's double-lined drain-pipes are also shown, but these are too well known to need description. A newer form of drain-pipe is that known as Wakefield's, the special feature being the series of corrugations in the sockets, which, while insuring the true alignment of the pipes, do not prevent the cement-grout from passing completely around the space between the socket and the spigot.

A good model of the Septic Tank apparatus for the purification of sewage is exhibited at Stall No. 6, but was not working at the time of our inspection. As the first installation of the system at Exeter has more than once been described in our columns, a detailed account is now unnecessary. The system has evoked a great amount of interest, and bids fair to be the most successful among the numerous systems of sewage purification which have yet been tried on a satisfactory scale.

Messrs. Farrer, Barber, & Co., at Stall No. 7, exhibit a flushing tank, which "has been selected by the judges for further practical trial." They also show Chisholm's pneumatic lavatory, the special feature of which is the syphonic waste. We do not see much advantage to be gained by the application of the syphon to lavatories. If the basin is filled above a certain point the whole of the water is syphoned out, which is to our mind a disadvantage.

We shall have more to say on the Exhibition in our next, when we will also give the list of awards for those exhibits which are of special interest to our readers.

#### THE LONDON COUNTY COUNCIL.

THE first meeting of this Council after the summer recess was held at Spring Gardens on Tuesday, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee it was agreed to lend the Islington Vestry 21,000l. for street improvements, &c.; St. George's-in-the-East, 3,000l. for paving works; the St. Margaret and St. John, Westminster, Vestry, 13,000l. for paving; the Strand Guardians, 7,035l. for the erection of receiving wards; the Wandsworth Guardians, 11,400l. for the erection of a nurse's home; and the Central London District School Managers, 32,000l. towards the cost of erecting an asylum at Hendon.

**No Tenders.**—It was announced that no tenders had been received in response to the Council's invitations for the erection of Benson-buildings, under the Boundary-street scheme or for Abingdon-buildings, under the same scheme, or for cottage dwellings at Brook street, Limehouse.

**The Transfer of Powers.**—The Council resumed and concluded the consideration of the proposals of the conference which was held some months ago between the Council and the Local Authorities with regard to devolution of powers. Several of the recommendations of the conference were adopted at a previous meeting (see our issue for June 25 last).

It was now agreed—"That the powers of the Council to remove unauthorised signs on getting a magistrate's order be transferred to the Local Authorities, but that power be given to the Council to act in default of the Local Authorities."

It was further resolved—"That powers be given to the Local Authorities concurrently with the Council to take proceedings with regard to the storing of wood and timber under Sections 107 and 200 (17h) of the London Building Act, 1894, and in regard to the demolition of buildings erected in contravention of the Act, under Section 170, subject to the powers of the Local Authorities being limited under the latter section to cases where they have obtained the convictions upon which demolition proceedings are based."

It was next recommended—"That the maintenance of the Victoria Embankment and por-



tion of streets adjoining in the precincts of the Savoy and the footways of the Albert and Chelsea Embankments be transferred to the Local Authorities; and that the lighting, watering, and cleansing of the Victoria Embankment and the footways of the Albert and Chelsea Embankments be transferred to the Local Authorities, subject to the maintenance and lighting of the walls of the embankments being retained by the Council.

It was next agreed:—“That the maintenance of main roads be transferred to the Local Authorities; that the power of sanctioning the closing of streets for repairs be transferred to the Local Authorities; that the words ‘with the sanction of the Council’ be omitted from the provision enabling Vestries and District Boards to close or stop up streets during paving or sewerage works; that the power of the Council to require main roads when maintained by a Vestry or District Board to be repaired to the Council’s satisfaction be repealed on transfer of such roads to the Vestry or District Board; that the powers of the Council under the Electric Lighting Provisional Order Confirmation Acts, as regards the appointment of inspectors, provision of testing stations, and exercise of powers with reference to price and energy of the supply of electricity in a district, be not transferred to the Local Authorities; that the Local Authorities be given concurrent power with the Council to apply to Parliament for powers to make improvements of public utility wholly within their districts, and not intended to be paid for wholly or in part out of the county funds.”

The Committee (the Local Government and Taxation) recommended: “That the powers of the Council to make by-laws or regulations for the good rule and government of the county, or any specified part thereof, be not transferred to the Local Authorities.”

Lord Onslow moved as an amendment: “That the recommendation be referred back to the Committee, the Council being of opinion that, while the making of by-laws should rest with the Council, the application of certain by-laws in the several localities should be left to the discretion of the Local Authority, and that in any transfer of powers, provision should be made for this purpose.” He thought that the localities should have the power of enforcing in their own districts such by-laws as they considered useful and tending to the good government of those districts. On the other hand, he could not see why the Council should impose upon the localities any by-laws which they considered unnecessary and undesirable.

After a long discussion the Council divided, and the amendment was rejected by 75 votes to 32. The Committee’s recommendation was then agreed to.

The Committee recommended that the powers of the Council to declare a business to be an offensive business be not transferred to the Local Authorities. The recommendation was agreed to.

Some discussion ensued upon the next recommendation of the Committee, which was as follows:—“That the Local Authorities should be made responsible by the Legislature for inspecting and registering slaughterhouses, knackers’ yards, offensive businesses, cow-houses, dairies, milkshops, and milkstores, and enforcing the by-laws or regulations made by the Council; and that the Council should retain the power to make by-laws or regulations in respect of all these matters, and should have power to act in default of a Local Authority, as under Section 100 of the Public Health (London) Act, 1891, the necessary powers of inspection being retained for these purposes.”

This was agreed to, as also were the following: “That concurrent powers be vested in the Local Authorities to apply to the Local Government Board to alter the regulations of the water companies; that the power of the Council to register and inspect all common lodging-houses, and regulate management accommodation and sanitary condition be not at present transferred to the Local Authorities; that the Local Authorities be given concurrent powers with the Council to make representations to Railway Commissioners as to traffic facilities, stations, &c.

**Result of Legal Proceedings—Formation of a Street out of King-street West, Hammersmith.**—The Building Act Committee reported as follows:—

Mr. W. H. Gibbs, after having given notice to the District Surveyor, commenced the erection of

residential flats, to be approached by a street leading out of King-street West, Hammersmith; and subsequently submitted an application for the Council’s consent to the formation of the street. This was refused by us, acting on behalf of the Council, on April 4 last; the statutory reason for the refusal having been that the proposed street would not afford direct communication between two streets formed and laid out for carriage traffic. As the work of erecting the buildings was, however, continued, proceedings were taken in respect of the formation of the street without the Council’s consent. At the hearing before the magistrate it was stated that, as consent had been refused, Mr. Gibbs intended to keep his land private by placing gates at the entrance of the approach to the buildings, which approach was intended solely for the use of the occupiers; and the magistrate, after stating that the authorities as to what was a street within the meaning of section 7 of the London Building Act, 1894, were in a most unsatisfactory state, dismissed the summons on the ground that the approach to the buildings was to be kept private, but consented to state a case for the opinion of the High Court. As it is desirable that, if possible, an authoritative decision should be obtained upon the important question involved, we have directed the solicitor to take all necessary measures for getting a case stated and obtaining a decision of the High Court thereon.

**The Water Supply.**—Mr. Crooks moved a resolution that, in view of the existing difficulty in obtaining an adequate supply of water in a large portion of the County of London, it be an instruction to the Water Committee to forthwith submit its proposals with regard to legislation affecting the water supply in the ensuing Session of Parliament. After discussion,

Mr. Dickinson moved the adjournment of the debate, and this was carried. The Council adjourned at half past seven o’clock.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

**Hampstead.**—A three-story addition, &c., to a building erected at the south-western corner of Antrim-street, abutting also upon England’s-lane (Mr. W. F. Cave).—Consent.

**St. Pancras, North.**—The erection of baths and wash-houses on the north side of Prince of Wales-road, Kentish Town, between Grafton-road and Willes-road (Mr. W. N. Blair for the Vestry of St. Pancras).—Consent.

**Paddington, South.**—An iron and glass conservatory upon the one-story hall at No. 5, Connaught-place, Bayswater (Mr. E. S. Prior for Mr. J. M. Scott).—Consent.

**Strand.**—Iron and glass covered ways at the entrances to the Cafe Monaco, in Shaftesbury-avenue and Regent-street, St. James’s (Mr. E. E. White for Messrs. G. & B. Monico).—Consent.

**Strand.**—An iron and glass shelter in front of Horrex’s Hotel, Norfolk-street (Mr. S. Franklin for Mr. W. Horrex).—Consent.

**Bethnal Green.**—An oriel window in front of the new baths and wash-houses on the west side of Ramsey-street (Mr. R. S. Ayling for the Vestry of Bethnal Green).—Consent.

**Dulwich.**—Ten houses, with shops, on the east side of Beckenham-road, Penge, between Green-lane and Cotingham-road (Mr. H. T. Bonner for Mr. A. H. Batley).—Consent.

**Finsbury, Central.**—A church with a projecting tower and porch on the east side of Colney Hatfield-lane, Muswell Hill, at the corner of Alexandra Park-road (Messrs. Gordon, Lowther & Gunton for the Trustees of Muswell Hill Wesleyan Church).—Consent.

**Fulham.**—An iron and glass shelter at the Granville Theatre of Varieties, The Broadway, Waltham Green (Mr. F. Matcham for the Granville Theatre Company).—Consent.

**Fulham.**—One-story shops upon the forecourts of Nos. 663, 665, and 667, Fulham-road (Mr. F. W. Potter).—Consent.

**Hampstead.**—Buildings on the south side of Lyndhurst-road (Mr. W. A. Burr, for Mr. J. Tomblin).—Consent.

**Lewisham.**—Five houses, with one-story shops, on the north side of Stanstead-road, Catford, between No. 319 and Stanstead-grove (Mr. A. C. Baker, for Mr. W. A. Jewell).—Consent.

**Lewisham.**—Open wooden porches at Nos. 27 and 29, Garlies-road, Lordship-lane (Mr. A. Stark).—Consent.

**Marylebone, West.**—A three-story bay-window in front of No. 21, St. John’s Wood-road (Mr. R. A. Briggs, for Colander J. A. Temple).—Consent.

**Norwood.**—A block of residential flats on the east side of Upper Tulse-hill, at the corner of Wimbart-road (Mr. E. Loader for Mr. H. Loader).—Consent.

**St. George, Hanover-square.**—An iron and glass shelter erected at the restaurant entrance to the Berkeley Hotel, No. 77, Piccadilly (the Berkeley Hotel Company, Limited).—Consent.

**Woolwich.**—Bay windows to seven houses on the south side of Spray’s-street, Plumstead (Messrs. Church, Quick, & Whincop for Mr. E. Kemp).—Consent.

**Wandsworth.**—That the application of Messrs. Gibbs & Moore for an extension of the periods within which the erection of one-story shops upon part of the forecourts of Nos. 151, 153, 155, 157, 159, 161, 163, 165, 167, and 169, Balham High-road, was required to be commenced and completed, be granted, upon condition that the shops referred to be commenced within eighteen months and completed within thirty months from February 22, 1898.—Agreed.

**Kensington, South.**—A block of residential flats, with projecting porches, bay windows and balconies, on the east side of Addison-road, between a roadway on the south side of The Limes, Holland Park-gate, and No. 1, Addison-road (Mr. F. Hoffmann for Mr. E. Collins).—Refused.

**Lewisham.**—A three-story addition upon part of the forecourt of No. 8, Northbrook-road, Lee (Mr. H. Cottell for Miss Wood).—Refused.

**Lincolshire.**—An oriel window, at the first floor level, in front of No. 22, Ben Jonson-road (Mr. R. Peters for Mr. J. B. Hyerly).—Refused.

**Hackney, North.**—A one-story stable on the north side of Seven Sisters-road, Stoke Newington, between No. 273 and the Manor House public-house (Mr. J. W. Ransome for the North Metropolitan Tramways Company).—Refused.

**Hackney, South.**—A one-story shop upon part of the forecourt of No. 46, Brooksbys-walk, Homerton (Mr. J. F. Chout for Messrs. Jones & Sons).—Refused.

**Hackney, South.**—A mission-church and clubhouse on a site at the junction of Chatsworth-road with Powerscroft-road, Lower Clapton (Messrs. B. Crewe & F. R. Farrow for the vicar and churchwardens of All Saints Church).—Refused.

**Battersea.**—Blocks of residential flats, with projecting bays, on a site on the west side of Albert-road, to abut also upon Prince of Wales-road (Mr. W. D. Goodwin for Mr. W. Goodwin).—Refused.

**Battersea.**—Rebuilding of the “Windsor Castle” tavern, No. 36, St. John’s Hill (Messrs. F. J. Eedle & Meyers for Mr. E. J. B. Hyerly).—Refused.

**Finsbury, Central.**—The rebuilding of the “Lord Vernon’s Arms” hotel, Nos. 180 and 182, Pentonville-road, Clerkenwell (Messrs. Robb & Grierson for Mr. W. H. Scott).—Refused.

**Hackney, North.**—That the vestry of Hackney be informed that the Council leaves the vestry to take such proceedings as it may deem necessary with respect to a wooden structure erected upon the public way in front of No. 35, High-street, Kingsland, in advance of the general line of buildings.—Agreed.

**Dulwich.**—A church-room on the western side of Lordship-lane, at the corner of Dulwich Common-road (Mr. C. Barry for the vicar and churchwardens of St. Peter’s church).—Consent.

**Dulwich.**—Twelve houses with shops, on the east side of Beckenham-road, Penge, between Cotingham-road and Kingsdale-road (Mr. H. T. Bonner for Mr. A. H. Batley).—Consent.

**Greenwich.**—A two-story addition with a bay window, at the rear of No. 54, Shooter’s Hill-road, Blackheath, to abut upon Kidbrooke Park-road (Mr. W. J. Hardcastle for Mr. D. Birt).—Consent.

**Kensington, South.**—An inclosed porch and wooden hood in front of No. 2, Cottensmore-gardens, Victoria-road (Mr. S. R. Tatham for Mr. H. W. Simpkinson).—Consent.

**Kensington, South.**—A wood and glass conservatory on the roof of an open portico in front of No. 15, St. Mary Abbott’s-terrace (Messrs. Weedon & Shrimpton for Mrs. Hamley).—Consent.

**Kensington, South.**—An iron hood over the entrance to No. 14, Holland-park-avenue (Mr. G. N. Watts for Mr. G. Pearce).—Consent.

**Kensington, South.**—Wood and glass inclosures to the verandah in front of No. 15, Sussex-villas (Mr. H. Hanks for Mr. S. C. Kemble).—Consent.

**Lewisham.**—Twelve houses, with one-story shops, on the west side of Brockley-road, between Rectort-road and the London, Chatham, & Dover Railway (Messrs. F. & W. Abbia).—Consent.

**Lewisham.**—An addition to Vancouver House, Dacres-road, Sydenham, to flank upon Inglemore-road (Mr. H. W. Pratt for Mr. W. King).—Consent.

**Marylebone, West.**—An iron and glass covered way to the entrance to No. 4, Marlborough-place (Mr. E. H. Abbott for Mr. O. Imray).—Consent.

**Peckham.**—One-story shops upon part of the forecourts of Nos. 26 and 28, Rye-lane (Messrs. C. A. Richards & Co. for Mr. H. McLaren).—Consent.

**St. George, Hanover-square.**—Iron and glass inclosures at each end of the covered balcony at the first-floor level of No. 16, Curzon-street, Mayfair (Messrs. G. Trollope & Sons for Miss B. Wynne Roberts).—Consent.

**Wandsworth.**—A parish-room on the south side of Gundersfield-road, Streatham, next St. Andrew’s Vicarage (Messrs. Ernest George & Yeates).—Consent.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



**Battersea.**—Five-story bay-windows to four blocks of flats on the north side of Cambridge-road, Battersea Park (Mr. R. D. Hanson for Mr. J. K. Ward).—Refused.

**Dulwich.**—One-story shops upon part of the forecourts of Nos. 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, and 94, Lordship-lane (Mr. R. A. Hinds for the London and South-Western Bank, Limited, Mr. G. H. Judd, and Mr. Castle).—Refused.

**Dulwich.**—A one-story shop upon part of the forecourt of a house on the north side of Crebhor-street, eastward of No. 4, Cyprus Villas, East Dulwich (Mr. A. E. Mullins for Mr. Gosling).—Refused.

**Dulwich.**—A one-story office and stable building on the south side of Grove Park, eastward of No. 25 (Mr. A. E. Mullins for Mr. J. Huckle).—Refused.

**Hampstead.**—An iron and glass covered way to a house known as "Lyleston," on the south side of Eton-avenue (Messrs. Dore, Hunter, & Co. for Mr. J. Welford).—Refused.

**Kensington, South.**—A greenhouse on part of the forecourt of No. 110, Fulham-road, to abut upon Selwood-terrace (Messrs. J. Weeks & Co., Limited, for Mr. F. Miller).—Refused.

**Lewisham.**—Twelve shops, with stables at the rear, on the north-east side of Springbank-road, Hither Green (Mr. A. C. Baker for Messrs. Osborne, Son, & Co.).—Refused.

**Newington, West.**—One-story shops upon part of the forecourts of Nos. 154, 156, 158, 160, and 162, Walworth-road (Mr. C. Trubshaw for the Midland Railway Company).—Refused.

**Poplar.**—A one-story shop on the forecourt of No. 80, Manchester-road, Cubitt Town (Mr. C. Brown for Mr. W. Colmer).—Refused.

**Poplar.**—A one-story addition in front of Brunswick Hall, Brunswick-road (Mr. R. Plumble for the Chairman and Committee of the Poplar Hospital for Accidents).—Refused.

**Southwark, West.**—A sign-board in front of Nos. 68 and 70, Lant-street, Borough (Messrs. Webb & Co.).—Refused.

**Strand.**—Three iron balconies to the first-floor windows at the Criterion Restaurant, Piccadilly (Mr. F. T. Verity for Messrs. Spiers & Pond).—Refused.

**Westminster.**—Bay-windows to Block 3 of residential flats on the north-east side of Carlisle-place, at the corner of Francis-street (Messrs. Norton, Rose, Norton, & Co. for Mr. G. Martin).—Refused.

**Woolwich.**—A one-story addition on a portion of the forecourt of the Red Lion public-house, No. 13, Mulgrave-place (Mr. A. L. Guy for Messrs. Whitebread & Co., Limited).—Refused.

**Wandsworth.**—An iron and glass covered way at the entrance to the "Spread Eagle Hotel," High-street (Mr. J. W. Brooker for Mr. H. P. Stuart).—Consent.

**City of London.**—A two-story angle turret to No. 89, Upper Thames-street, at the corner of Allhallows-lane (Mr. A. J. Gale for the City of London Brewery Company, Limited).—Consent.

**Hampstead.**—A portico to No. 25, Lindfield-gardens (Messrs. Bochner & Gibbs for Mr. E. A. Cave).—Consent.

**Kensington, South.**—A block of residential flats on the east side of Addison-road, next No. 1, with projecting open porches, five-story bay windows, and balconies (Mr. P. Hoffman for Mr. E. Collins).—Consent.

**Strand.**—An iron and glass shelter at the entrance to Haxell's Hotel in Exeter-street, Strand (Mr. A. B. Hayward for Mr. L. Haxell).—Consent.

**St. Pancras, South.**—An addition to the porch at No. 1, Upper Woburn-place (Mr. C. FitzRoy Doll for the Duke of Bedford).—Consent.

**Camden, North.**—One-story porches erected in front of two houses on the east side of Flodden-road, northward of No. 5 (Mr. E. Avern for Mr. P. Arnold).—Consent.

**Dulwich.**—Six houses with two-story bay windows on the site of No. 2, Lyndhurst-road and grounds (Mr. A. E. Mullins for Mr. W. Laud).—Consent.

**Fulham.**—That the application of Mr. F. Matcham, on behalf of Sir J. Johnson, for an extension of the period within which the erection of buildings on the sites of Nos. 14, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, and 41, Harwood-road, Fulham, and also on the site of stabling at the south end of that road, at the corner of Moore Park-road, was required to be commenced, be granted, upon condition that the buildings referred to be commenced within nine months from April 5, 1898.—Agreed.

**Islington, North.**—One-story shops upon part of the forecourts of Nos. 123 and 125, Stroud Green-road (Mr. F. E. Kier for Mr. D. F. Kier).—Consent.

**Lewisham.**—One-story shops upon part of the forecourt of No. 30, Dartmouth-road, Forest Hill (Messrs. Eastman Brothers).—Consent.

**Paddington, North.**—An iron and glass covered way on part of the forecourt of No. 2A, Blomfield-road, Maida-hill (Messrs. W. Denisham & Sons for Mr. Matland).—Consent.

**St. Pancras, East.**—A theatre on the west side of High-street, Camden Town, to abut also upon Crowndale-road and Bayham-place (Mr. W. G. R. Sprague for Messrs. Marler & Saunders).—Consent.

**Wandsworth.**—A dwelling-house and a house with shop on the south side of Fountain-road, Lower Tooting, at the corner of Blackshaw-road (Messrs. J. Milledge & Sons for Mr. R. W. Wilcox).—Consent.

**Dulwich.**—That the application of Mr. J. W. Brooker for an extension of the period within which the erection of one-story additions upon part of the forecourts of the Walmer Castle Tavern, and No. 100, Beckham-road, was required to be commenced, be granted, upon condition that the additions referred to be commenced within twelve months from December 21, 1897. That Mr. Brooker be informed that his application for a modification of the condition attached to the Council's consent having been considered, the Council sees no reason to depart from its decision restricting the height of the addition to 14 ft. above the footway.—Agreed.

**Wandsworth.**—Twelve shops on the site of The Hawthorns and grounds, on the west side of Balham high-road, with the flank of the southernmost shop to abut also upon Marius-road (Mr. F. Perks for Mr. R. Simpson).—Refused.

**City of London.**—A four-story oriel window at the King's Arms public house, Lower Thames-street, at the corner of Water-lane (Mr. H. M. Wakley for Reid's Brewery Company, Limited).—Refused.

**Chelsea.**—A three-story bay window in front of No. 4, Danvers-street, Cheyne-walk (Mr. C. R. Ashbee).—Refused.

**Hackney, North.**—Additions to the Finsbury-park hotel, No. 336, Green-lane, Stoke Newington, to abut upon Woolberry-grove (Mr. E. Ruutz for Mr. W. E. Matting).—Refused.

**Islington, North.**—A water-closet and urinal at St. John's Tavern, Junction-road, to abut upon St. John's Park (Mr. J. Taft for Mr. D. Bushill).—Refused.

**Lewisham.**—A three-story bay-window in front of No. 8, Northbrook-road, Lee (Mr. H. Cottell for Miss Wood).—Refused.

**Marble Hill, East.**—An additional story upon the present two-story porch, &c., at No. 10, Sussex-place, Regent's Park (Mr. W. Whiteley for Mr. Symons).—Refused.

**Rotherhithe.**—A church on the west side of Southwark Park-road, Bermondsey (Mr. J. C. T. Murray, for the Building Committee of the Bermondsey Presbyterian Church).—Refused.

**St. Pancras, North.**—One-story shops in front of Nos. 35, 37, and 39, Lisimore-road, Haverstock Hill (Mr. E. J. Stevens for Mr. W. Smith).—Refused.

**Islington, East.**—Six two-story cottages, partly on the site of Nos. 4 and 5, Roads-place, Hornsey-road (Mr. R. Midworth for Mr. J. F. Spencer).—Refused.

**Southwark, West.**—A five-story addition, to be used as dormitories, at the rear of No. 31, Bennett-street, Stamford-road, to abut upon Bennett's-mews (Messrs. J. D. Mathews & Son for Messrs. Cook, Son, & Co.).—Refused.

**Wandsworth.**—A building on the site of No. 285, Balham High-road, to abut also upon Tooting Bec-road (Mr. W. W. Gwyther for the City Bank).—Refused.

**Woolwich.**—A temporary wood and iron hall adjoining the premises of the Church of England Soldiers' Institute, and also abutting on Wellington-street and St. John's-passage (Messrs. Humphreys, Limited, for the Institute).—Consent.

**Rotherhithe.**—A four-story printers' factory on the north side of Tooley-street, St. Olave, Southwark, to abut upon Unicorn-passage (Mr. G. W. Thompson for Mr. A. Coudrey).—Consent.

**Kensington, South.**—A one-story studio at the rear of No. 64, Bedford-gardens, to abut upon Campden-street (Mr. C. Stanley Peach for Mr. B. M. Jenkin).—Consent.

**Poplar.**—Eleven houses on the east side of Cottage-street (Mr. J. W. Wyles for Mr. A. Bacon).—Consent.

**St. Pancras, East.**—A mission building on the east side of Wakefield-street, within the prescribed distance of the centre of a mews known as Regent-buildings (Mr. T. Arnold for the trustees of the English Presbyterian Church, Regent's-square).—Consent.

**Hackney, Central.**—A warehouse on the site of Nos. 1, 2, 3, and 4, Grove-cottages, Grove-lane (Mr. J. Hamilton for Mrs. Siegenberg).—Refused.

**Lambeth, North.**—A warehouse on the south side of Sapphire-place (Messrs. J. Laphorne & Company for Messrs. Atkinson & Company).—Refused.

**Lewisham.**—An addition to the Forest-hill Brewery Company's premises at less than the prescribed distance from the centre of Church-vale-road, Forest-hill (Mr. W. Bradford for the company).—Refused.

**Slepyne.**—A four-story building, with shops on the ground floor, upon part of the forecourt of Lyceet Chapel, Mile-end-road, to abut also upon White-horse-lane, at less than the prescribed distance from the centre of the road (Mr. J. F. Parker for the Rev. P. Thompson).—Refused.

**Islington, East.**—Six two-story buildings on the south side of Road's-place, Hornsey-road, partly on the site of Nos. 4 and 5 (Mr. R. Midworth for Mr. J. F. Spencer).—Consent.

**Greenwich.**—A one-story building on the west side of Bishops-buildings, Thames-street (Messrs. G. F. Harvey & Co.).—Consent.

**Lincoln.**—That the application of Messrs. E. N. Clifton, Son, & Hope for an extension of the period within which the erection of a one-story building to abut upon Wapping Dock-street and Cinnamon-street respectively, was required to be commenced and completed, be granted.—Agreed.

**Woolwich.**—An addition to the Woolwich Theatre,

at less than the prescribed distance from the centre of Rope-yard-rails (Mr. F. Matcham for Mr. S. Barnard).—Refused.

**Deptford.**—A four-story mineral water factory on the east side of Church-street, Deptford, to abut also upon Creek-street (Mr. G. Banks).—Refused.

**Rotherhithe.**—A grain-pit erected at Trinity Wharf, Rotherhithe-street, at less than the prescribed distance from the centre of the road (The British Drying Company, Limited).—Refused.

**Poplar.**—A one-story warehouse at Ferguson's Wharf, West Ferry-road, to abut upon a public footway leading to Millwall Pier (Mr. J. Hollway).—Refused.

#### Cubical Extent.

**City of London.**—The erection on the west side of Moorfields, between Tenter-street and White-street, of a building to exceed in extent 250,000 cubic feet, and to be used only for the purposes of the trade of a fine art and book publisher (Messrs. Raphael Tuck & Son Limited).—Refused.

#### Buildings for the Supply of Electricity.

**Hampstead.**—That the Council do approve of the plans, dated July 19, 1898, submitted with the application of Mr. J. Hudson, for the Vestry of Hampstead, for the construction of an addition to the offices at the generating station and works at Lithos-road.—Agreed.

#### Buildings on Low-lying Land.—Part XI.

**Woolwich.**—That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Mr. T. J. Young, for the erection of five dwelling houses on low-lying land situated on the north side of Bostall-lane, Abbey Wood, Plumstead (for Mr. J. Bailey).—Agreed.

Recommendations marked † are contrary to the views of the Local Authority.

[We are compelled, for want of space, to hold over other applications until next week.]

#### COMPETITIONS.

**CONSTABULARY OFFICES, WARRINGTON.**—The Watch Committee have given their awards in this competition as follows:—First premium, Mr. R. Burns Dick, 55, Northumberland-street, Newcastle-on-Tyne; second, Messrs. Tapper & Crouch, Gray's Inn-buildings, Gray's Inn, London, W.C.; third, Mr. J. Lane Fox, Bond-street, Dewsbury. Mr. R. L. Bennett, F.R.I.B.A., of Cooper-street, Manchester, was appointed by the Corporation as assessor, on the recommendation of the Royal Institute of British Architects.

#### ENGINEERING SOCIETIES.

**SOCIETY OF ENGINEERS.**—At the meeting on Monday, the 3rd inst., Mr. W. Worby Beaumont, President, in the chair, a paper was read by Mr. Sherard Cowper-Coles on "Protective Metallic Coatings for Iron and Steel." The author commenced by pointing out the comparative corrodibility of iron and steel under varying conditions, and the importance of the subject now that steel, which corrodes more rapidly than iron, is so largely used for structural purposes and for building light craft, such as torpedo boats. He then gave some interesting examples of cases where failures had occurred in engineering structures owing to the rapid corrosion of iron and steel. He then stated that up to the present zinc had been found to be the most effective coating which was due to the electro-chemical action set up between the steel and zinc. The author also explained that the electro-chemical action set up between two different metals made it necessary to carefully insulate copper sheathing from the steel hulls of ships, and rendered the direct application of copper valueless as a protective coating to iron and steel. A short history of the galvanising industry was then briefly given, together with details of the improvements that have been introduced from time to time. A comparison was drawn between hot and cold galvanising, and the results obtained when tested by the Post Office test for determining the thickness of zinc coatings. The method of cold galvanising was then fully described, and the methods of preparing iron surfaces for receiving the coating of zinc. A description was also given of some improvements in the acid treatment and sand blasting for the removal of mill scale preparatory to zincing. The process of sand blasting was fully described. The sand blast apparatus consists of an air-chamber and hopper into which the air is forced at a pressure of about 5 lbs., and projected through a soft rubber-tube fitted with a steel nozzle. It was stated that the harder the surface the more vigorously the small



particles of sand or shot attacked it. Amongst the most useful applications of this process is that of sharpening files and frosting glass. The question next dealt with was the cost and output of various galvanising plants, and a description was given of a special apparatus for the treatment of wires and tubes. Some details were given of an American process which has lately been tried with some success for the more economical galvanising of wires. In this process coils or bundles of wire are dipped in a bath of molten zinc, and are then placed in a centrifugal machine to remove the excess of metal. The vexed question of what the formation of zinc spunge is due to was discussed, and the results of some recent investigations were given. The author finally explained the best working conditions for electro-zincing, and gave a comparison of the actual and theoretical weight of zinc obtained for a given amount of electrical energy. In conclusion attention was drawn to cadmium and copper as protective coatings for iron and steel, and their advantages and disadvantages compared with those of zinc were stated.

THE INSTITUTION OF JUNIOR ENGINEERS.—On the 24th ult. a party of about one hundred members of this society availed themselves of the opportunity kindly afforded by Sir David Salomons, Bart., to inspect his engineering workshops, laboratories, lecture theatre, &c., at Broomhill, Tunbridge Wells. At the conclusion Mr. H. B. Vorley, the Chairman, expressed the cordial acknowledgments of the Institution. Sir W. H. White, F.R.S., is to deliver his presidential address on Friday, October 21.

#### BOOKS RECEIVED.

HOUSE DRAINAGE; ITS INSPECTION AND TESTING. By Richard J. Jenkins. (The St. Bride's Press.)

CARPENTRY AND JOINERY. By Frederick C. Webber. (Methuen & Co.)

### Correspondence.

To the Editor of THE BUILDER.

#### NATIONAL SOCIETY FOR CHECKING THE ABUSES OF PUBLIC ADVERTISING.

SIR,—It is proposed at an early date to present to the London County Council the memorial in which attention is drawn to the need of municipal control over all forms of spectacular advertising, with special reference to recent developments of the practice.

The memorial is to be signed exclusively by London architects, and already about 350 signatures have been received. Will you permit me through your columns to remind those architects who have postponed their reply to our circular that if they desire to help us in the matter they ought, without delay, to return the draft duly signed?

RICHARDSON EVANS, Hon. Sec.  
1, Camp View,  
Wimbledon, Surrey.

#### THE SCARCITY OF WATER.

SIR,—Every year we get more severe warnings of the increasing difficulty of supplying large towns with water, and of the danger from prolonged drought, and yet, in the face of these difficulties, we make very little effort to economise the supply we already have, and which in tropical climates would often be considered ample. Take London, for instance. The area of London is roughly speaking about 100 square miles, or 64,000 acres. One inch of rain represents about 100 tons of water to the acre, or 6,400,000 tons in London alone. The average yearly rainfall in ordinary weather is over 20 in.; so in an average year the rainfall in London is over 128,000,000 tons, and there are 224 gallons to a ton. Practically the whole of this enormous quantity of water is allowed to go direct into the sewers, and has to be purified before being discharged into the rivers. Surely this waste should be stopped. The impurities in rain water are easily filtered out, and it is much better for washing purposes in every way than hard water. If used by every house, it would help to relieve the enormous strain on the water companies, and would leave a larger reserve in the springs and wells for times of drought, and would also take part of the storm water which overloads the sewers. The great number of baths now fitted to houses flush the drains fairly well twice a day, so that the storm water from the streets alone would be quite sufficient for that purpose. In

country places, which are also in some cases now feeling the want of water, it would be a good thing to have earth closets fitted, which could be used in times of drought or frost, and so remove the necessity of sending large quantities of clean water down the drains.

GUY M. NICHOLSON.

#### FITTINGS NOT IN ACCORDANCE WITH CONTRACT.

SIR,—By the enclosed cutting from the *Daily Chronicle* you will learn that a Birmingham bicycle builder undertook to build a bicycle with certain specified fittings, whereas he delivered the bicycle with most of the fittings otherwise than as contracted for. The company whose fittings were specified (not the customer for whom the bicycle was built) prosecuted the bicycle maker for an infringement of the Merchandise Marks Acts. The maker's counsel admitted the offence and said his client had acted carelessly, but had no intention to commit a fraud. The magistrate convicted the bicycle builder, and ordered him to pay 40s. and 2 guineas costs.

It would be interesting to your readers to know whether the builder of a house who had entered into a contract to fit it with certain fittings, but put other fittings not of the exact kind required by the contract, would be similarly liable to prosecution either at the instance of the building owner with whom he had contracted, or at the instance of the person whose proprietary articles were specified; and if not, why not? There may be this distinction, that the Acts above mentioned apply only to "chateaux," and that the fittings of a house when fixed would be ready.

ARCHITECT.

\* It is hazardous even for lawyers to give opinions on Acts of Parliament, which become more conundrum-like every day, unless they have been carefully argued. But we should say that the Merchandise Marks Act was not intended to apply to the latter case suggested by our correspondent.—ED.

#### AN OLD LONDON MAUSOLEUM.

SIR,—Adverting to the letter you printed on August 27 I may refer your correspondent to the family memoirs of the Rev. Wm. Stukeley, edited, 1882-7, by the Rev. W. L. Lukis for the Surtees Society, Durham. Vol. I, p. 6, and Vol. III, pp. 18-21, contain extracts from Stukeley's copious diary, thus:—

1750, April 20, I agreed . . . for Mr. Hogin's house, garden, and pasture, at Kentish Town. . . . After nine years assiduous enquiry I found a most agreeable rural retreat at Kentish Town, two miles and a half distant. . . . the latter end of the village, between the castle inn and the chapel, an half-hour's walk over sweet fields. . . . The house is new built for the most part. . . . In the year 1760 I bought the whole estate, a lease from St. Bartholomew's Hospital, for 999 years. . . . I built a new bed chamber to the south. . . . I inclosed two acres of meadow out of the great pasture, . . . made a retired place like a hermitage, a kitchen garden, &c. . . . On June 4, 1764, put up Sir Nicholas de Stueley's monumental brass effigies in the chapel of my mausoleum at Kentish Town.

The diary, in many volumes, and a mass of cognate MSS. were once owned by John Britton; they belonged, circa 1882, to the Rev. H. F. St. John, of Dinmore House, near Leominster. D. M.

### The Student's Column.

#### SOUND, LIGHT, AND HEAT.—XV.

SOUND : THE ISACOSTIC CURVE.

IN the last article we referred to Scott Russell's isacoustic curve. The principle embodied in this is particularly brought into play in the mode of setting out the seats in any large building so as to secure that each occupant of a seat shall have direct uninterrupted hearing and sight. Professor Roger Smith refers to this mode of setting out as follows:—The seats must be ranged not as tangents to a straight line, but on a concave curve to be set out in the following manner:—The position and height of the speaker and of the auditors occupying the first seat being determined, a line is to be drawn from the speaker's mouth touching the point where the top of the first auditor's head would come, and at the proper distance say, for example, at 2 ft. 6 in. back, the situation of the seat for the second auditor is to be marked, and on the line indicating the back of it a height of 1 ft. 6 in. or less is to be set off upwards from the point where the ray from the speaker's mouth touched; this is to mark the position of the top of the head of the second auditor. By repeating this process, setting up 18 in. at each seat, a series of points are found all ranged in a curve, and this is the "isacoustic" curve of Mr. Scott Russell. Each seat will be placed about 2 ft. 9 in. below the mark indicating the top of the head of its occupant, and the floor on

which each stands should be about 1 ft. 6 in. lower than that. Professor Smith observes that these dimensions, especially the 1 ft. 6 in. for face room, are in excess of what will suffice where space has to be rigidly economised.\*

Lachéz proposes the following dimensions to fulfil these requirements:—

	ft. in.	ft. in.
Back to back of seats...	1 11½ to 2 5½	
Height of seat ...	1 5½	
Seats to top of head ...	2 11½ to 3 6	
Face room ...	6 to 10	

The isacoustic curve when the auditor is a good deal below the speaker has the property of dipping down slightly at its commencement, and under such circumstances a flat floor might be substituted without serious disadvantage for part of the curve. The degree of steepness requisite will vary with circumstances, such as, for instance, whether it is essential for the auditors to look down on a table or merely to look up at a speaker, and the more space that can be allowed for each seat, from front to back, the less inclination will be requisite (Smith). This principle is exemplified in the lecture theatre of the Royal Institution; and speaking of that room, from a practical standpoint it is not successful throughout. Anybody who has had the misfortune to be located on one of the top seats will remember the irresistible tendency to bend the head forwards, and the tiring operation of looking into the depths beneath for upwards of an hour. The majority of the lectures are illustrated by experiments, which must be seen for the lectures to be fully comprehended.

Even for lecture theatres, where it is desirable to get each auditor as near to the lecture table as possible we are not sure, but that the low ceiling is not the better form. If the floor is so arranged as to slope upwards from the lecturer and the seats to curve round each low tier being so arranged that all the auditors upon it shall be practically equidistant from him, that would seem to be the most convenient method of arrangement. The majority of people who have had much experience as auditors in small lecture theatres, both of the high and the low type, will probably agree that though there might be a slight loss of sound in the back seats of the last mentioned type, that the experiments could be better seen than if the latter had to be looked down upon in the distance, as in the case of the former type of room. Again, from the lecturer's point of view it may be confidently asserted that many men prefer to speak outwards rather than both upwards and downwards. As a matter of fact, in reference to theatres having a deep well, the auditors in the upper seats rarely catch a glimpse of the speaker's face unless the principle of the isacoustic curve can, therefore, be better applied in practice to very large theatres, where many of the disabilities mentioned could not be averted. Indeed, one of the earliest applications of the principle is on the large scale, for, approximately, the Romans employed the isacoustic curve in the amphitheatre at Nîmes.

The special object of keeping ceilings moderately low is to prevent the loss of sound upwards, though the nature of the lining of a lofty ceiling can in many instances modify effects. Moderately low ceilings must always run *pari passu* with the good proportion of the whole of the interior. In the House of Commons it was found that the ceiling was too lofty; it was lowered, the angles were cut off, and the ceiling formed of wood, which arrangement materially improved its acoustic properties. Similar examples might be quoted in reference to other buildings.

#### REFRACTION OF SOUND AND LIGHT.

Hajech has shown that the laws of the refraction of sound are the same as for those of light and heat. Atkinson observes that refraction of light is the deflection or bending which the rays of light experience in passing obliquely from one medium to another—for instance, from air into water. If the incident ray is perpendicular to the surface separating the two media it is not bent, but continues its course in a right line. All the light which falls on a refracting surface does not completely pass into it; one part is reflected and scattered, whilst another penetrates into the medium. In uncrystallised media, such as air, liquids, ordinary glass, the luminous ray is singly refracted; but in certain crystallised bodies, such

\* Roger Smith, "Acoustics" *Op. cit.* p. 44.



as Iceland spar, selenite, &c., the incident ray gives rise to two refracted rays. The latter phenomenon is called double refraction.

Dealing only with single refraction, in which we are more particularly interested, so far as sound is concerned, it may be stated that when a luminous ray is refracted in passing from one medium into another of a different refractive power, the following laws (known as Descartes' laws) apply:—

(a) Whatever the obliquity of the incident ray, the ratio which the sine of the incident angle bears to the sine of the angle of refraction is constant for the same two media, but varies with different media.

(b) The incident and the refracted ray are in the same plane, which is perpendicular to the surface separating the two media.

The ratio between the sines of the incident and refracted angle is known as the index of refraction.

With reference to sound, in Hajech's experiments he used tubes filled with various gases and liquids, and closed by membranes; the membrane at one end was at right angles to the axis of the tube, while the other made an angle with it. Ganot,\* speaking of this method, states that when these tubes were placed in an aperture in the wall between two rooms a sound produced in front of the tube in one room (that of a tuning-fork, for instance) was heard in directions in the other varying with the inclination of the second membrane, and with the nature of the substance with which the tube was filled. Accurate measurements showed that the law held that the sines of the angle of incidence and of refraction are in a constant ratio, and that this ratio is equal to that of the velocity of sound in the two media. Thus the velocity of sound in water is not very different from that in hydrogen, and the deviations produced are nearly equal.

Sound waves are known to be analogous to those of light and heat, so far as refraction is concerned, in many other ways. Sondhauss constructed lenses of gas by cutting equal segments out of a large collodion balloon, and fastening them on the two sides of a sheet-iron ring a foot in diameter, so as to form a double convex lens about 4 in. thick in the centre. Atkinson, in "Ganot," states that this was filled with carbonic acid, and a watch was placed in the direction of the axis; the point was then sought for on the other side of the lens at which the sound was most distinctly heard. It was found that when the ear was removed from the axis, the sound was scarcely perceptible, but that at a certain point on the axial line it was very distinctly heard. Consequently the sound waves in passing from the lens had converged towards the axis; their direction had been changed—they had been refracted.

Another instance of the refraction of sound is detailed by Atkinson (*Op. cit.* p. 221), which has been known to scientists for a long time. As we have before seen, sound is propagated in a direction against that of the wind with less velocity than with the wind. This is probably due to refraction on a large scale. The velocity of wind along the ground is always considerably less than at a greater height; hence the front of a condensed wave which was originally vertical becomes tilted upwards and with the lower part forward; and as the direction of the wave-motion is at right angles to the front of the wave, the effect of the coalescence of a number of rays, thus directed upwards, is to produce an increase of the sound in the upper regions. The rays which travel with the wind will, for similar reasons, be refracted downwards, and thus the sound is heard better.

From the practical standpoint the principles of refraction are immediately connected with the various media through which sound passes, and particularly in the atmosphere. This has been foreshadowed to some extent in our observations on temperature and pressure of the air as applied to acoustics, but, as the student will have noticed, the refraction of sound is also to a large extent bound up in reflection. Refraction and deflection of sound rays can only come into noticeable operation in the interior of very large halls and theatres, and many of the effects produced by the phenomenon have hitherto been commonly ascribed to reflection, the state of the air in rooms not having been sufficiently taken into consideration.

#### SOUND: CONCLUSION.

The acoustic properties of a public building, or theatre, may be considerably modified by

\* *Op. cit.*, 1893, p. 220.

means of drapery, or by the character of its furniture. Experiments in this direction have been carried out, principally, when the building was empty—which is a mistake. The difficulty of satisfactorily dealing with the matter whilst a crowded audience is in attendance will be immediately recognised; on the other hand, the latter act as modifiers of sound in the building, and ought to be reckoned with. It is common knowledge with many interiors that whilst echo is very noticeable in them when comparatively empty, there is considerable improvement when they are full, and it is in the latter condition that they should be most fully considered. The echo in many an interior has been practically done away with by lining the walls with more or less pervious plastering, and in smaller buildings by the judicious hanging of curtains. More than once it has been remarked that, with reference to churches, the echo has been much less when the floors of the aisles have been carpeted than when they were bare and their stone slabs encouraged reflection.

The parabolic reflector has not, perhaps, had its day for all purposes of reinforcement; and the sounding board bids fair to create more attention than it has done in the past. The floors of the stage or platform will, unless we are mistaken, be more frequently constructed on the principles of the sounding-board, and it will not be long ere resonant chambers will be made, both in shape and in other particulars, more with reference to the shape and size of the hall or theatre in which they are to be placed. Still, there is yet a very great deal to be learned in the actual methods of construction of interiors when these latter are, primarily, to be made subservient to the known laws of acoustics. The practical man and the theorist must become better acquainted with each other.

#### GENERAL BUILDING NEWS.

RESTORATION OF ST. MARY'S CHAPEL, ABERDEEN.—St. Mary's Chapel is the only ancient example of ecclesiastical stone vaulting in Aberdeenshire, and its restoration has been proceeding during the last five or six years. In 1893 the restoration movement was formally started. A public-spirited offer by Mr. G. G. Jenkins, Mr. William Kelly, and Mr. A. Marshall Mackenzie, A.R.S.A., architects, Aberdeen, to give their services as an Architectural Committee free of charge was accepted, and practical steps were taken for carrying out the work. The chapel consists of three portions—the nave (ending towards the east in an octagonal apse) and the north and south transepts. The first thing done was to take out the carved oak seating and other woodwork of the chapel. This included the timber flooring. Then the thick coats of plaster were cleaned off the walls and the vaulted ceiling, revealing the fine stone vaulting, with its moulded ribs rising from quaintly-carved stone corbels, and marked at the intersection by equally interesting bosses. The stripping of the lath and plaster from the west walls displayed some fine rib-vaulting which adds two new splendours to the roof. In this west wall, too, were discovered—one in the south transept and the other in the north—two old staircases which formerly led up to the choir of old St. Nicholas Church. These interesting old relics have been laid fully bare. Prior to the restoration the floor of the chapel was all on one level, including the south transept, which served as the vestry of the East Church. In its original state, however, the floors of the north and south transepts were at a higher level than the floor of the nave, and this order of things has been reverted to. The floor of the nave has been slightly lowered and the floor of the transepts slightly raised, so that there is now 2 ft. of difference in the level, and a broad flight of four steps rises from the floor of the nave, as in ancient days, to the transepts on either side. The floor-level of the apse has also been slightly raised. Much careful labour has been spent on the vaulted ceiling. On the removal of the plaster, the stone vaulting was seen to be in a good state in many places, so that new stones had to be inserted. This had to be done from the bottom upward. Perhaps the most delicate work, and that which now shows the best results, was the restoration of the four massive piers which are the main supports of the roof. The bases of the piers were very much decayed, but new blocks have been inserted. The floor of the transepts, as well as the nave, has been laid with granite. The ancient carved woodwork which, prior to the restoration, formed the benches, desks, &c., of St. Mary's Chapel, has been carefully preserved. Part of it has been utilised to form an oaken dado round the chapel. A certain portion has been used to form a high "wall-back" to the pulpit-seat at the west end of the nave. The wall-back is surmounted by a carved oak canopy over the long oaken seat. Still another portion of the carved woodwork has been used to form the front of the long pulpit-deck. On the raised floor in the apse

is a pink granite communion table. In the north transept is the octagon font of granite. The windows of the chapel have had special attention in connexion with the restoration. There are three windows of three lights each in the apse, and one window of two lights in each of the transepts. Till millions of these have all been renewed, and other minor improvements effected, and as soon as the work can be carried through, the windows will be filled with stained glass. The chapel will be lighted with the electric light and seated with chairs.—*Aberdeen Free Press.*

PROPOSED RESTORATION OF ST. GEORGE'S CHURCH, LEEDS.—A scheme for the restoration and general improvement of St. George's Church, Leeds, is being promoted by the vicar and others. In their statement of the requirements of the case the vicar and officers of the church say:—"The roof of the church is in bad condition, and it is absolutely necessary that serious structural repairs be undertaken at an early date. Besides this, the interior is very dark and dirty, and badly ventilated; the pews are high and straight-backed, and, to many, uncomfortable; there is no light whatever at the east end of the choir, and there is an absence of proper vestry accommodation for the clergy and choir." The committee have drawn up a scheme which comprises (1) the thorough cleaning, painting, and decoration of the interior of the church; (2) a new roof; (3) new pews for the body of the church; (4) electric lighting; (5) the construction of an apse at the east end; (6) more commodious vestry accommodation; (7) the re-arrangement of the heating apparatus. The cost of the scheme will be 5,000l. The architect is Mr. H. Walker, of Leeds.

RESTORATION OF STEEPLE, GREAT MARLOW PARISH CHURCH.—It is proposed to restore the spire and pinnacles of this church, and to repair the stone work of the tower. Mr. John Oldrid Scott is the architect.

REOPENING OF BRETHERTON CHURCH, LANCA-SHIRE.—Bretherton Church has just been renovated and reopened. The architects were Messrs. Austin & Paley, of Lancaster.

ST. AMBROSE CHURCH, EDGBASTON, BIRMINGHAM.—The new Church of St. Mary and St. Ambrose, Edgbaston, was consecrated on the 28th ult. by the Bishop of Worcester. It is Gothic in style, and is erected on a site, given by Lord Calthorpe, at the corner of Pershore-road and Raglan-road. The edifice, which provides seating accommodation for over 700 worshippers, is built of red brick, with terra cotta dressings upon the outside, and bath stone dressings in the interior. It consists of a nave 90 ft. long, with a chancel 36 ft. long, north and south aisles, shallow north and south transepts, a choir vestry, with organ over an apsidal projection at the west end forming a baptistry, and a south porch. A tower and spire, 150 ft. in height, are in course of construction at the north-west corner, and are expected to be completed, together with a peal of tubular bells, by next Easter. The floor of the body of the church is wood, the aisles being paved. The cost, exclusive of fittings, will be 8,000l. The gifts include a carved pulpit, in Caen stone (the work of Messrs. Bridgeman, of Lichfield). The organ is by Messrs. J. W. Walker & Sons, of London, and the east window by Messrs. Hardman & Powell, the subject of which is the "Te Deum." The architect of the church is Mr. J. A. Chatwin, and the work of building is carried out under the superintendence of Mr. G. Day, by Messrs. Collins & Godfrey, Tewkesbury.

INDEPENDENT CHURCH, BUXTON, DERBYSHIRE.—A new vestry has been erected in connexion with the Independent Church at Buxton. The builder was Mr. Bagshaw, and the architect was Mr. Holland.

U.P. CHURCH HALL, SOUTH LANGSIDE, GLASGOW.—The memorial stone has just been laid of the Church Hall in connexion with the new U.P. Church to be formed at Newlands, South Langside. The hall is situated to the south-west of the new Millbrae Bridge over the Cart, near Langside Railway Station. The style of the hall is Gothic, the plans being by Messrs. Stark, Malcolm, & Rowntree, Glasgow. It is capable of seating 350 persons, and will cost about 1,450l. The mason work is being executed by Mr. Alexander Stewart, and the woodwork by Mr. W. Cowan.

UNION CHURCH, BEESTON.—The foundation stone has been laid of a church for the Baptist and Congregational bodies at Beeston. In addition to the main building, there will be the usual accommodation in the shape of class and school rooms. The architect is Mr. C. N. Holloway, of Nottingham, and the building contract has been given to Mr. William Turner, of Beeston.

NEW STABLES AND CULVERT, PERTH.—The new stables at Perth Harbour, belonging to the Police Commissioners, which have been erected in connexion with the new manure depot at the Friarton, and the new culvert into which the water from Craigie Burn has been diverted, were opened recently. The stables consist of sixteen stalls, with bothy, store, and boiler-house on the ground floor, with double shed, giving accommodation for twenty carts, two loose boxes, &c. The buildings are about 145 ft. long. The contractors were:—Mason and brickwork, Messrs. Fraser & Morton; joiners, Messrs. Watson & Crichton; plumbers, Messrs. J. & P. Murray; slater, Mr. James Buchan; plasterer, Mr. John Peebles; ironwork, Mr. William Hume;



painter work, Mr. George Muirhead. The cost was 2,500l. The culvert, which is of brickwork, is about 520 ft. long, and is an arched sewer 8 ft. broad by 4 ft. 6 in. high, and cost 1,500l. It was constructed by Mr. Peter Gerrity. Both the stables and the culvert were designed by and constructed under the personal supervision of Mr. Robert McKillop, Burgh Surveyor.

**DRILL-HALL, ORMSKIRK.**—The tender of Mr. William Fyles, builder, of Ormskirk, for the erection of a new drill-hall for the Ormskirk companies of the 3rd V.B.K.L.R. has been accepted. The architect is Mr. H. Rimmer, of Ormskirk.

**ALTERATIONS, ALBERT HALL, SWANSEA.**—Messrs. Bennett Bros., of Swansea, are engaged in carrying out alterations at the Albert Hall, Swansea. The plans were prepared by Messrs. Wilson & Moxham. The alterations entail the enlargement of the cloak-room, the erection of underground lavatories, &c., and a gallery in the minor hall.

**NEW WING, EXETER MUSEUM.**—An addition is now being made to the Albert Memorial Museum at Exeter, in commemoration of the Queen's Diamond Jubilee. The new wing is to be known as the "Exeter Technical and University Extension College." The new buildings will be mainly at the rear of the Museum, with a frontage of about 24 ft. towards Upper Paul-street. The front, three stories high, will be built of Pocombe stone with Ham Hill dressing, in harmony with the adjoining additions to the Museum, erected a few years ago. It will be of an Italian Gothic character. The wing will contain five large class-rooms, a physical laboratory, students' reading-room, east-room, with staff and apparatus rooms, lavatories, and offices. These will all be fitted with electric light and heated by hot water. The buildings have been designed by Messrs. Tait & Harvey, of Exeter; and the contractors are Messrs. Ham & Passmore.

**DRILL-HALL, CHESTERFIELD.**—On the 28th ult. Lord Roberts opened a Drill-hall at Chesterfield, which the town has erected for the use of the local Volunteers, as a memorial of the Diamond Jubilee of her Majesty. The hall is situated on Ashgate-road. The elevations are of red brick, relieved with stone dressings, and there is a frontage to the main road of 105 ft. The entrance consists of a vestibule 12 ft. square, in which are placed steps leading to the hall. This entrance has front and flanking buttresses of brickwork, relieved with stone, the upper portion being carved. The main front is set back some distance from the road, and enclosed with ornamental iron railings. On the main front, in the centre, is a turret, which is used as a means of ventilating the hall. The interior forms one large hall, 150 ft. long by 55 ft. wide. The roof is of steel, covered with match boarding, stained and varnished. At the east end of the building are the officers' quarters of the Derbyshire Regiment, also the principal offices of the headquarters. At the west end of the hall is a band gallery. In the basement is a store-room. Mr. C. Jackson, of Chesterfield, is the architect, and Mr. John Wright, of Chesterfield, obtained the contract, the sub-contractors being all local men.

**CABOT TOWER, BRANDON HILL, BRISTOL.**—The Marquis of Dufferin and Ava recently opened this tower, which has been erected in memory of the discovery in 1497 of North America by John Cabot and a crew of Bristol sailors. The tower, which has been erected in the centre of the platform upon which the guns captured in the Crimean War stood, is a square structure of ornamental character. It has buttresses at the angles from base to summit. There are two stages, each of which is relieved with an ornamental balcony. The floor of the upper balcony is 75 ft. from the base, and above this there is an octagonal spire of 35 ft. The tower is ascended by means of a circular staircase to the first stage, and above that there is a spiral staircase to the second stage. The architect was Mr. W. V. Gough. The spire of freestone is surmounted by a gilded figure mounted on a globe, also gilded. The platform on which the tower is erected is square and is 42 ft. across. The tower is 364 ft. above sea level.

**THE WHITWORTH HALL AT OWENS COLLEGE, MANCHESTER.**—Contracts have been entered into for the superstructure of the Whitworth Hall at Owens College, the foundations of which have been completed. Messrs. William Southern & Sons, of Salford, have succeeded in obtaining the contract, and the cost is believed to be about 40,000l. The erection of the building will occupy about three years. The building will adjoin the present museum of the college in Oxford-street, close to the Christie Library. The main entrance is to be in Oxford-street, and there will also be an entrance in Burton-street. The building is from the design of Mr. Alfred Waterhouse, the original architect of the college buildings.

**HOME, ANCOATS.**—On the 26th ult. the memorial stone was laid of the New St. Vincent's Home, in St. Vincent's-street, Ancoats, which is to be provided by the Sisters of Charity of St. Vincent de Paul. It is for the purpose of a night refuge for destitute girls, and also for training girls for work outside the home. The architect is Mr. A. Hill.

**NEW PREMISES, HUCKNALL TORKARD INDUSTRIAL PROVIDENT SOCIETY.**—New premises for the Hucknall Torkard Industrial Provident Society have just been opened. The structure has been erected from plans prepared by Mr. A. N.

Bromley, architect, of Nottingham. The premises comprise four shops, and include a tailoring department on the basement and a workroom on the first-floor, a drapery department with show-room, a shop for millinery, combining a small office, a provision establishment, all on the ground floor, whilst on the first floor is located the general offices of the society, the board-room, and secretary's apartments, with strong-room for deeds and other conveniences. On the second floor a hall, provided with suitable entrances and exits at either end, and capable of accommodating 450 persons, has been built. The total cost is estimated at about 6,000l. Mr. Joseph A. Minks was the contractor.

**PROPOSED NEW TOWN HALL FOR SCARBOROUGH.**—Colonel C. H. Luard, R.E., held an inquiry in the Town Hall, Scarborough, on the 26th ult., on behalf of the Local Government Board, with respect to an application by the Corporation for power to borrow 35,575l. for the purchase of the St. Nicholas House Estate. The Corporation are acquiring the property with the view of using the mansion-house for public offices, and converting the gardens into pleasure grounds for the use of the public. The Corporation also asked the sanction of the Board to the sale of four acres of land in Seamer-lane required by the North-Eastern Railway Company for additional siding accommodation. With reference to the St. Nicholas House Estate, Mr. H. W. Smith (Borough Engineer) produced the plans of a suggested scheme for dealing with the existing mansion-house. The outer walls of the building, he explained, would be preserved. Inside there would be a rearrangement of rooms, and a new chamber would be provided, as well as rooms for the use of the Councillors, and in addition accommodation would be provided for various municipal offices, which at present were scattered about the borough. In reply to the Inspector, the Town Clerk stated that the existing Town Hall in Castle-road would probably be disposed of, but was not yet settled. Then St. Nicholas House would become the Town Hall. The Corporation wished to secure the gardens for the use of the public, in which case they would be saved from the hands of the speculative builder.

**SCHOOL, HOVE.**—The first of the three schools which are to constitute the new schools erected in Portland-road by the Hove and Aldrington School Board was opened on the 26th ult. Messrs. Clayton & Black are the architects, and Messrs. Jay are the contractors.

**CHURCH SCHOOLS, MILES PLATTING.**—The memorial stones of the extensions to St. Mark's Church Schools, Holland-street, Miles Platting are shortly to be laid. The architects are Messrs. Potts, Son, & Pickup, of Manchester. The new infant school will be a one-story building, and will consist of a central hall, 39 ft. by 31 ft., and four class-rooms opening out of it. Externally the building will be ornamented by red pressed bricks with terra-cotta dressings, and internally the rooms will be brightened by glazed brick dados. The builders are Messrs. A. R. Bullivant & Sons.

**HOTEL, SOUTHWOLD.**—At the adjourned general annual licensing meeting for the borough of Southwold recently, before Messrs. Charles Foster (Chairman), Mayhew, and Edwards, Mr. H. Spence, managing director of the Coast Development Co., Limited, applied for a provisional grant of a licence for a proposed new hotel. Mr. E. Reeve appeared for the applicant, and stated that the hotel would be erected on a site commanding a fine sea view, and forming portion of the land recently purchased by the company. This land would be developed for building purposes, and as the company intended in the coming Parliamentary session to apply for a provisional order to erect a pier at which steamers could stop, it was anticipated in the near future that the increase of visitors would be great. At the present time there was need of further first-class hotel accommodation. Mr. Reeve proceeded to explain the plans which had been prepared by Mr. C. H. M. Mileham, of Lincoln's Inn-fields, architect. The ground-floor plan provided for a coffee-room 50 ft. by 33 ft., a lounge 36 ft. by 24 ft., reading, smoking, billiard, and bicycle rooms, with manager's room and offices. The basement rooms for men servants and visitors' servants. On the first floor there will be drawing-room 36 ft. by 19 ft., while upwards of forty bedrooms would be provided for guests. The plans were to be drawn so as to provide for an extension giving sixty more bedrooms, and the total cost, with the extension, would amount to 20,000l.—The Chairman announced that the application would be granted.

**STEAM LAUNDRY, CARDIFF.**—A new steam laundry was recently opened in the Marlborough-road, Roath. Its erection has cost 6,000l. The ground on which the laundry has been erected forms part of the Tredegar Estate. Messrs. Habershon & Fawcner, were the architects. Messrs. W. Lancaster & Co., of Cardiff, secured the contract for the building, while the whole of the plant has been supplied by Messrs. Bradford & Co. The actual building is some 130 ft. long by 60 ft. wide. The front is faced with white marble, and is designed in the Renaissance style.

**EXTENSION OF THE ROYAL ALBERT ASYLUM, LANCASTER.**—The foundation stone of the extension of this asylum has just been laid. The new wing is to be built at the south-east angle of the

Brooke Wing, and will be about 150 ft. long and two stories high, the ground floor for the accommodation of fifty cripples, and the first floor (which is level with the ground floor of the main building) for fifty epileptic patients. The plan is on the pavilion principle, and each floor consists of a day-room 54 ft. by 32 ft. at the end, with a smaller room opening out of the main room; two dormitories, one 60 ft. long and the other 41 ft. long, and 27 ft. wide, projecting at right angles from the main corridor; a stone staircase, and lavatory, bath-room, and water-closets, &c., in separate blocks, with a disconnecting corridor. A sitting-room and a bedroom are provided on each floor for a married couple as attendants. The floors of the corridors and offices will be fire-proof, laid with wood blocks and tiles, and the walls lined partly with glazed brick, all the angles being rounded. There will be a hydraulic lift. The materials used and the style of architecture will correspond with the present buildings. The work will be carried out under the superintendence of the architects, Messrs. Austin & Paley, Lancaster. The contractors are as follow:—Mason's work, Mr. James Toms, Grange-over-Sands; joiners' work, Messrs. Girdlewell & Co., Barrow-in-Furness; slaters' work, Mr. James Soar, Leeds; plastered work, Mr. Oswald Lister, Ilkley; plumbers and glaziers' work, Messrs. Braithwaite & Co., Leeds; heating, Messrs. A. Seward & Co., Lancaster; painting, Mr. E. Payne, Lancaster. The cost of the new block, without furniture, is estimated at about 15,000l.

**HOUSE, BRIDLINGTON.**—A new club-house for the Yorkshire Yacht Club-house Company, Limited, has just been opened at Bridlington. Mr. W. S. Walker was the architect, and the contract for building was let to Messrs. Whitaker Brothers.

**POLICE OFFICES, KILMARNOCK.**—The Burgh Police Offices in Sturrock-street were opened on the 2nd ult. The building consists of court hall, magistrates' room, chief constable's room, charge room, guard room, and sixteen cells. The architect was Mr. W. W. Reid.

**CHURCH RESTORATION, LEGERWOOD, N.B.**—On the 25th ult. this church was reopened after having undergone considerable restoration, and being added to in many particulars. The building has all its ancient masonry intact for some height above the foundation. A Norman porch, with outer and inner doors, has been built for the south entrance. The chancel is roofed with British oak, and a ceiling of the same material formed within the intersecting timbers, which are moulded and rest on short hammer beams laid on the large oak beams carried by the angle pillars. The work has been carried out by local tradesmen from plans by Messrs. Hardy & Wight, architects, Edinburgh.

**RESTORATION OF INNERPEFFRAY CHURCH, CRIEFF, N.B.**—The ancient church or chapel of Innerpeffray, situated in an elevated position near the River Earn, three miles east of Crieff, has recently been restored. The roof of the chapel has been thoroughly overhauled and repaired with stone slates in keeping with the old roof. An improvement has been made by the removal of the soil all round the church, and exposing a fine dressed double base course, which was hidden before. Oak doors studded with iron bolts have been put up, and the floor of the chapel has been levelled. The architect was Mr. G. T. Ewing, of Crieff.

**HOME FOR GIRLS, LANCASTER.**—The Stoney Home for feeble-minded girls was recently opened by the Countess of Bective. The home will accommodate forty of the senior and more intelligent girls, who have either completed their training in the Royal Albert Asylum, or are entering upon their last year of residence there prior to discharge. The building, which was designed by the late Mr. E. H. Howard Dawson, of Lancaster, and has been carried out by his successor, Mr. Chas. J. Ashworth, architect, of Lancaster, occupies a site on the west side of Ashton-road, the main front facing the Royal Albert Asylum. The walls are built of local stone, faced with broken courses. The roofs are covered with Westmorland green slates and red terra-cotta ridges and finials. The gables are of half-timber work, with panels of tinted cement stucco, finished with moulded barge-boards.

**BOARD SCHOOL, BARRY ISLAND.**—The Barry School Board have recently opened an infant school, on Barry Island. The building is of red brick, with Forest stone dressings, and consists of two school-rooms divided by a movable partition, two class-rooms, babies' room, and a toilet room, the accommodation being for 288. A special feature has been made of the arrangements for ventilation and heating, as the Board wished to secure the greatest possible hygienic results, and, upon the recommendation of the architect, they decided to adopt mechanical means on the plenum system, as being the most efficacious to secure thorough ventilation throughout both summer and winter. The plant is fixed in a roomy basement under the cloak-room, and comprises a powerful heater, fan, and a gas-engine for driving the latter. The air is filtered before passing through the fan, so as to remove all impurities; it is then forced over and around the heater, and then along glazed earthware flues to the different points as required. The fresh, pure air, which is heated in the winter and is cool in the summer, is delivered through ornamental register gratings overhead into the various rooms, and, after making a circuit of



them, takes its exit through extractors near the floor. Thus any portion of the air becoming vitiated is at once removed from the rooms. We are informed that a series of trials has shown that the results are highly successful, the air, after being admitted, being thoroughly diffused without any perceptible draught, although in some instances the entire volume in a room is changed once in about ten minutes. The installation, although exceedingly simple, is very complete in every respect, and provision has been made for its extension to the further block of school buildings which the Board contemplate erecting. Although ordinary fresh air inlets and fanlights are provided to be used in case of necessity, the teachers prefer to have them closed as they consider, after testing the system, that the filtered air as delivered by the fan is far more agreeable and pure than that coming in by the ordinary inlets. The whole of the work has been carried out under the superintendence of the architect, Mr. G. A. Birkenhead, of Cardiff. The heating and ventilating apparatus has been laid down by Messrs. Musgrave & Co., of Belfast, and the contractor for the building was Mr. J. Lewis, of Cadocton, Barry.

**SUNDAY SCHOOL, PERRAN-AR-WORTHAL, CORNWALL.**—A church Sunday school has just been opened at Perran-ar-worthal. The building is constructed of local stone and granite facings. The main room is lighted by six lights. The work has been executed by contract from plans by Mr. Swift, of Truro. Mr. E. Barnicoat, of Mylor, has done the masonry, and Messrs. J. and G. Row the carpentry.

**SCHOOLS, WHITWELL.**—New church schools have just been erected at Whitwell. The new buildings are Gothic in style, and accommodation is provided for 150 pupils in each of the boys' and girls' schools, which include in each case one large room and three class rooms. In the infants' department accommodation is provided for 350, including one large class room and other conveniences. The architect was Mr. Joseph Smith, of Sheffield.

**OFFICES, BRISTOL.**—New offices are being erected in Telephone-avenue, Bristol, for the directors of the National Telephone Co. The frontage of the new building will extend for a distance of about 104 ft. towards Telephone-avenue, which is to be the name of the street connecting Baldwin-street and Marsh-street, and it is to be faced with Cattybrook bricks, with stone dressings. On the ground floor are an entrance hall, with offices for the local manager and staff, and public call rooms. The switch room occupies the whole of the rear portion of the building, and is 73 ft. long and 31 ft. wide, lighted from the roof. On the same floor are girls' dining-rooms, kitchen, cloak-rooms, and lavatories. The first and second floors are devoted to offices for the district manager and staff, and for the various departments. On the lower ground floor are the test rooms, instrument room, general stores, strong room, lavatories, workmen's rooms, &c. The contractors are Messrs. W. Cowlin and Sons, and the work is being carried out from the designs, and under the superintendence of Mr. Edward Gabriel (Edmeston & Gabriel), of Bristol and London.

**SCHOOL-CHAPEL, RUGBY.**—On the 1st inst. the Archbishop of Canterbury visited Rugby and reopened the school chapel and unveiled a stained glass window in memory of Dean Goulburn; he afterwards uncovered a memorial slab, with medallion portrait, of the late Archbishop of Canterbury (John Benson). On account of the increase in the number of boys in the school it became necessary to make further sitting accommodation in the chapel. For this purpose the whole of the west end has been remodelled in memory of the Rev. P. Bowdler Smith. Aisles have been provided and a great west window introduced. Additional accommodation has been provided for eighty boys. The work of remodelling has taken about twelve months to complete. The memorial window, the subject of which is Christ Blessing Little Children, is the work of Mr. Jackson, R.A., the architect of the school-chapel. On the opposite side of the south transept to the window is the medallion portrait of Dr. Benson. Mr. Bruce Joy, R.H.A., is the sculptor.

**OFFICES, EDINBURGH LIFE ASSURANCE, BRISTOL.**—New building for the Edinburgh Life Assurance Company has recently been erected at the corner of Baldwin-street and Marsh-street, Bristol. It is constructed of red brick with pennant and Bath stone dressings, the roof being covered with Bangor slate. The style is Georgian. The building has three block floors with the exception of the ground-floor, entrance hall, and passages, which are of marble mosaic. The building comprises five floors, each with lavatory and strong-room accommodation. The electric light has been carried to each room and passage, and the gas brought to all fireplaces. The staircase is in oak. Mr. A. J. Heaven is the builder. The architect is Mr. James Hart, of Bristol. The sanitary appliances have been provided by Mr. A. S. Scull.

**VICARAGE, NEWLAND, HULL.**—The foundation-stone of the vicarage in connexion with St. Augustine's Parish Church, Newland, has just been laid. The architect of the building, which will be 38 ft. 6 in. by 30 ft., is Mr. Temple Moore, of Westminster, and the contractor is Mr. T. Goates, who has built the church.

**SCHOOLS, ST. LAWRENCE, VENTNOR.**—The opening of the new parochial schools at St. Lawrence

took place a few days ago. The architects are Messrs. Colson, Farrow, & Nesbit, of Winchester, and the builders, Messrs. Ingram & Sons, of Ventnor. The building is of native stone with brick facings.

#### SANITARY AND ENGINEERING NEWS.

**DRAINAGE OF MIDDLESBROUGH.**—At a special meeting, on the 20th ult., the Sanitary Committee of the Middleborough Corporation considered a report made by Mr. J. Mansergh, C.E., with regard to the drainage of the town, and more particularly as to the measures necessary to prevent flooding in the marsh district. The recommendations of Mr. Mansergh embodied a scheme which would cost 40,000l. The Surveyor was requested to prepare specifications for a new iron sewer in Marsh-road, this being a very small portion of the entire scheme.

**THE PURLEIGH DISTRICT WATER SCHEME.**—Major-General H. D. Crozier, R.E., an Inspector of the Local Government Board, held an inquiry in the board-room at the Maldon Workhouse recently with respect to the application made by the Maldon Rural District Council for sanction to borrow 10,775l. for a water supply scheme for the parishes of Althorne, Cold Norton, Hazeleigh, Latchingdon, North Fambridge, Purleigh, Stow Maries, and Woodham Mortimer. Among those present was the engineer and surveyor, Mr. H. G. Keywood.

**MIDDLEBROUGH SEWERAGE SCHEME.**—The Local Government Board have approved the sewerage scheme submitted by the Surveyor (Mr. G. Fenwick Carter). The gravitation main will be 5 ft. 3 in. by 3 ft. 6 in. by 1 ft. 9 in. diameter; pumping engines, &c., of the double-cylinder horizontal type, with 10½ in. diameter, and 24 in. stroke, diameter of pump cylinders 10½ in., stroke 24 in., each capable of pumping 20,000 gallons per hour, the head inclusive of suction 40 ft. 3 in., delivery about 700 ft. The filters are on the biological system.

#### STAINED GLASS AND DECORATION.

**WINDOW, MANCHESTER CATHEDRAL.**—Messrs. Shrigley & Hunt, of Lancaster, have recently completed a stained-glass window, which is now being placed in the Bishop Fraser Chapel, at Manchester Cathedral, and is to the memory of Mrs. Agnes Fraser, the wife of the deceased prelate.

**NEW WINDOWS, OLDBURY.**—During the renovation of the Wesleyan Church at Oldbury, near Birmingham, a memorial window to the late Ezra Hadley, of that town (subject, "The Resurrection"), and one to the deceased members of the choir (subject, "A Choir of Angels Rejoicing"), have been erected. The work was designed by Mr. T. W. Camm, of Smethwick, and executed at his studio.

**NEW WINDOW, ST. LUKE'S, KEW.**—A stained-glass window has been added to St. Luke's Church, Kew Gardens, in commemoration of Her Majesty's sixtieth reign. The three lights are devoted to the representation of Our Lord as the Heavenly King, habited in the robes appropriate to Priest, King, and Royal Majesty. Over the central figure hovers the dove, surrounded by the nine orders of angels; and on the right and left stand the cherubim and seraphim covered with wings. The archangels, St. Michael and St. Gabriel, are placed before the throne; while in the lights next the centre the Virtues are shown offering up the prayers of the saints with incense. The window was designed and carried out by Mr. T. F. Curtis, of Messrs. Ward & Hughes, Soho.

**WINDOW, ST. EDWARD'S CHURCH, STOW-ON-THE-WOLD.**—During the last few weeks, Messrs. Wallis & Strang, of Newcastle, have erected a window in St. Edward's Church, Stow-on-the-Wold, Gloucestershire. The same artists have recently erected a two-light window in the parish church of Char-nock Richard, Coppull, Lancashire.

#### FOREIGN.

**FRANCE.**—Two large allegorical compositions by M. Sinibaldi, which were in the Champ de Mars Salon this year, have just been fixed in the Hall of the Ministry of Commerce. The designs sent in for the seventh annual competition of the "Société Nationale des Architectes" of France are at present on view at No. 3 Rue de Lutèce. The subject is a "Pavillon de Repas" in an International Exhibition. Last Sunday, the statue of J. F. Millet was inaugurated at his native town, Gréville, having been raised by public subscription. M. Marcel Jacques is the sculptor. The Commission des Monuments Historiques is carrying out, under the direction of its architect, the restoration of the ancient church of Notre Dame at Folgoët. The church, which dates from the fifteenth and sixteenth centuries, has two towers on the façade, one surmounted with a spire, the other with a Renaissance lantern. Before the west doorway are the remains of a cross erected by Cardinal Alain, whose statue, in stone, still exists. The south porch—the "Portique des Apôtres"—is decorated with very fine sculpture. In the interior the most interesting portions are the Chapelle de la Croix, the Treasure chamber, and a curious roof loft or jubé. It is announced that

the Chantilly Museum will be closed for the winter on the 15th inst. The Municipality of Marseilles has a scheme for getting water from a spring at the Fontaine l'Evêque, in the Department of the Var, using the lake of Allos as a reservoir. The work will occupy about six years, at a cost of about 14 million francs. A considerable portion of the new Sorbonne building will be ready for occupation during the present year. The Faculté des Lettres will have at its disposal the large amphitheatre and the theatres of geography and archæology. Those of Mathematics and Botany will also be ready, and the large tower of Astronomy, which rises above the general mass of the building, The Richelieu Theatre is to be the object of an important decorative scheme, to be carried out by MM. Dagnan-Bouveret, Toudouze, Comerre, and Jules Ferry. The death is announced of M. Albert Fernique, the engineer, at the age of 57. M. Fernique was Director of the Machine Drawing School at the Ecole Centrale des Arts et Manufactures, and member of the French "Société des Ingénieurs Civils." He was made Chevalier of the Legion of Honour for exceptional services during the siege of Paris. He rendered great assistance also in the improvement of photography. The death is also announced of M. Lauzat, engraver and lithographic artist, at the age of 33. He had undertaken the reproduction in lithography of the works of Puvion de Chavannes, as well as a large mural decoration which he was occupied on at the time of his death. The Cernuschi Museum is to be officially opened on the 12th inst. by the President of the Department of Fine Arts and Public Instruction.

**REGISTRATION OF ARCHITECTS IN CANADA.**—According to the *Canadian Architect*, the Quebec Architects' Act came into operation on September 1, on which date the period allowed for registration expired. It is understood that upwards of one hundred applications have been received from persons desiring to register and thereby be authorised to use the title "Architect." The Council of the Province of Quebec Association of Architects have been busily engaged of late with these and other matters pertaining to the operation of the new law. Arrangements are also in progress for the annual meeting of the Association, the exact date for which has not yet been fixed, but which is expected to take place towards the close of October.

#### MISCELLANEOUS.

**LABOUR MARKET IN THE COLONIES.**—The latest circular from the Emigrants' Information Office (31, Broadway, Westminster) states that as regards mechanics, all the Colonies are fairly well supplied with them, and in some of the larger towns, as St. John (New Brunswick), Toronto, Adelaide, Melbourne, and Sydney, the supply is more than sufficient. In Western Australia there has been hitherto a considerable demand for carpenters, masons, and others on the construction of numerous Government Works, but as several of these works have lately been completed, many hands have been discharged and have become available to supply any demand that may arise elsewhere in the Colony. In New Zealand there has been plenty of employment in the building, engineering, and most other trades, but the local supply of men has been generally sufficient. In Cape Colony and Natal the demand for mechanics is small, and any demand is met by men who have left the Transvaal, owing to the great depression which exists there. In many parts, however, of Australasia and South Africa there is a reasonable prospect of employment for a really competent mechanic, if he can afford to keep himself for the first few weeks, while he is looking about for work; and he has often a much better opening for placing his children than he would have here.

**GLASGOW WATER-PIPE CONTRACT.**—At a recent meeting of the Water Committee a letter was read from Messrs. Robert M'Laren & Co., Glasgow, whose offer to supply 995 tons of water-piping at 4088l. 7s. 4d. was recommended for acceptance by the Committee, withdrawing their offer. This course is taken by them in view of the decision of the Council overturning that recommendation, and agreeing to divide their contract, giving Messrs. M'Laren two-thirds, and Messrs. R. D. Wood & Co., Philadelphia, who were the lowest offerers, one-third. The pipes to be supplied by the American firm were those from 7 in. to 12 in. diameter, and by the local firm from 3 in. to 6 in. Messrs. M'Laren state that they had given an overhead price for the full contract, and that they could not undertake to accept the contract for the limited supply of small pipes unless they got 13s. a ton more.

**YORKSHIRE FEDERATION OF THE BUILDING TRADES.**—The annual meeting of the Yorkshire Federation of the Building Trades took place on the 22nd ult. at the Royal Exchange, Leeds, Alderman Jessop, Mayor of Huddersfield, presiding. Representatives attended from Leeds, Bradford, Sheffield, Hull, Huddersfield, Halifax, Barnsley, Dewsbury, Wakefield, and other centres. The following were elected officers for the ensuing year, viz.:—President, Mr. John Sinks (Sheffield); Vice-President, Mr. W. Nicholson (Leeds); Secretary, Mr. Dawson (Halifax); Treasurer, Mr. Thompson (Dewsbury); Auditors, Mr. Dews (Leeds) and Mr. Dawson (Huddersfield). A report was presented with regard to the work of



the past year, and, along with the balance-sheet, was unanimously adopted. The number of federated firms in Yorkshire was stated to be 1,250. Reports were received from every town as to the state of trade and the labour market, and information was given concerning the late dispute between the Lancashire and Cheshire Federation and the masons of those counties, which had arisen on the question of worked stone. After a stoppage of some weeks, it appeared, the men had acceded to the masters' terms. There were also handed in reports on the various minor disputes which occurred during the year in the building trade, and which were fortunately settled without intervention of the Federation; and details were discussed of matters of special interest, such, for instance, as the new Workmen's Compensation Act, the apprenticeship question, and the affiliation of all the federated districts of England; and it was decided that measures should be taken to ascertain the feeling of the masters throughout the country with a view to preparing a statement of the country adopted by some contractors of paying advanced rates of wages above the standard rates arranged between employers and workmen, was strongly deprecated by the meeting, and it was agreed that steps should be taken to prevent such action in the future. In reference to all important matters affecting the trade at this time, it was resolved to co-operate with the whole of the remaining county federations. Reports were submitted to the Executive from the different towns as to the desire for universal agreement between architects and contractors, and it was understood that an endeavour is being made to ensure fair and reasonable contract agreement between the two parties. The extreme pressure in the building trade, it was pointed out, has now greatly diminished, and there are very few contracts of any size for which tenders are being asked.—*Yorkshire Post*.

**NEWCASTLE SOCIETY OF ANTIQUARIES.**—A meeting of the Newcastle Society of Antiquaries was held on the 28th ult. in the library of the Old Castle, Mr. Richard Welford presiding. Mr. Walter Corder and Mr. Wigham Richardson contributed photographs of Carville Hall, and received the thanks of the Society. Mr. M. H. Graham exhibited plans of the Companies' Halls at the Friars, Newcastle, showing the contemplated alterations. He stated that the old stones were to be left, and the ancient features preserved, as far as possible. The place was to be made into a dwelling house. Mr. Graham was thanked by the members. Mr. C. S. Terry contributed a paper on "The Siege of Newcastle by the Scots in 1644." As a result of his investigations, he was able to present a detailed account of the disposition of the attacking force and the defence. Mr. Terry explained how the breaches were made in the walls, and how the Scots made their final assault and captured the town, on October 10, 1644. The material damage done during the course of the siege was considerable. Of the four churches, St. John's was the only one that escaped serious damage. The wall, the main fortification of the town, naturally suffered very material damage.

**ELECTRIC LIGHTING AT NEWPORT, MON.**—A Local Government Board inquiry was held at the Town Hall, Newport, recently, by Mr. Walter A. Ducat, into an application on the part of the Newport Corporation for sanction to borrow £150l. for the purpose of electric lighting, and 760l. for a new road-roller, scarifier and roller shed at Maindee. The Town Clerk (Mr. A. A. Newman) explained that the total expenditure to date on the electric lighting of the town was 74,665s., and the present application would, if granted, bring the total up to 80,815s. Of the amount now asked for, 5,000l. was for sub-stations and transformers of which there would be three, viz., at Cardiff-road, at Albion-street, and one at Maindee, and for low tension distributing mains and high tension mains and feeders; and 1,150l. was for emergency plant. Mr. Robert Hammond, the consulting electrical engineer, gave evidence, and said he knew of no town in England where building development had been so marked, in consequence of leases falling in, and small premises making way for buildings of a very high class.

**ABERDEEN GRANITE EXPORTS TO AMERICA.**—The declared value of the polished granite exported to the United States during the year ended 30th ult. was \$128,207. This branch of the Aberdeen granite trade has, owing to the increase of the United States tariff and the risk involved, been falling off for a number of years back.

**AN EMPLOYER'S LIABILITY FOR A DEFECTIVE SCAFFOLD.**—At the Bolton County Court on the 28th ult. a joiner named James E. Kelly was awarded 250l. against Messrs. J. H. & G. Marsden, Bridge-street Saw Mills, for loss of employment caused through injuries sustained by falling from a defective scaffold in April. Liability was admitted, and the case was only brought forward for the assessing of damages.—*Manchester Guardian*.

**THE ROYAL EXCHANGE.**—The unveiling of the new panels in the Royal Exchange by the Lord Mayor has been fixed for Monday next, October 10, at half-past twelve o'clock. One of the panels—the gift of the Corporation of London, is by Mr. Seymour Lucas, R.A., and depicts William the Conqueror granting a charter to the citizens of London.

It was recently exhibited at the Royal Academy. The other, by Mr. Sigismund Goetze, is the gift of Mr. Carl Meyer, and the subject is the offer of the Crown to Richard III.—*Times*.

**THE WORKMEN'S COMPENSATION ACT.**—As will be seen from an advertisement which appears in another part of this issue, the Liverpool Board of Legal Studies have arranged for the delivery of a course of lectures dealing with the liability of employers to compensate their workmen for injuries sustained in the course of their employment. The lectures, which will be delivered weekly on Monday evenings at 8 p.m., at University College, Liverpool, will be by Dr. A. B. Tugwell, barrister at law. Seven lectures will be delivered, and the date of the first is the 17th inst. In view of the uncertainty in the minds of employers and employed as to the scope of the Act which came into force last July, the lectures, which will be popular and non-technical in character, will no doubt be of interest and value. Similar courses might with advantage be arranged in other cities.

**KING'S COLLEGE: REPORT ON PRIZES.**—According to a Report by Professor Banister Fletcher, dated September 30, the competition for the free scholarships, the gift of the Company of Carpenters, took place in the College on September 26. There were 11 candidates, of whom eight were for examination. The result was—A. J. Wade, first; G. H. Briggs, second. The following figures show the growth of the Architectural Classes during the last five years—

Session	No. of students entered attending the classes.
1892-1893	28
1893-1894	47
1894-1895	75
1895-1896	120
1896-1897	145

The Report refers to the results obtained by students who had sat for outside examinations, the proportion of failures being but 15 per cent. In the Architectural History Class the prizes were awarded as follows—F. G. Bain, gold medal; C. J. T. Dadd, silver medal and 3l. in books; W. Marchmont, bronze medal and 2l. in books; W. G. Trew, certificate of distinction and 1l. in books. In the Architectural History Drawing Class the prize winners are—C. J. T. Dadd, certificate and 3l. in books; W. G. Trew, certificate and 1l. in books. The Architectural Studio, which opens every day and evening, has continued to be of great use to the students. It has been attended by eighteen students and much good work has been done. There has been a satisfactory increase of the day students. Many of the students are preparing their "Testimonies of Study" for the R.I.B.A. examinations, while others simply come and improve their powers of design and drawing and make practical working drawings of buildings to be erected.

**DURHAM AND NORTHUMBERLAND ARCHAEOLOGICAL SOCIETY.**—The members of the Archaeological and Architectural Society of Durham and Northumberland held their fifth outdoor meeting of the season on the 29th ult., the places visited being Newburn, Heddon, and Ryton. They assembled at the Central Railway Station, Newcastle, at half past ten, and drove to the first mentioned place by way of Benwell. Newburn Parish Church was visited. The edifice contains many objects of great interest to the archaeologist, and the history of the church was pointed out and described by Mr. C. C. Hodges, who also sketched the history of the church. The scheme of renovation and decoration recently completed at a cost of about 4,000l. was described by the vicar, the Rev. Dr. Nowell. After leaving the church, the party entered their conveyances and proceeded to Heddon-on-the-Wall, by way of Throckley. At this, the second stage of the excursion, a portion of the Roman Wall was inspected. Heddon Church was visited, and described by Mr. Hodges. He drew attention to the Norman chancel and the chancel arch, which is enriched with the zigzag ornament of that period. The next stopping place was Ryton, which was reached by way of Wylam. The thirteenth century nave received special attention, as did also the lancet windows in the south side of the chancel. A stone effigy of an ecclesiastic, probably an archdeacon, was also noticed, being of early and excellent workmanship. From Ryton the homeward journey was commenced.—*Newcastle Journal*.

**ABERDEEN CORPORATION TRAMWAYS.**—The city tramway undertaking was transferred to the municipality about six weeks ago. It has now been resolved to apply to Parliament in next session for a provisional order to authorise the reconstruction of the line from Kittybrewster to Woodside, and the adaptation of the whole section from the Queen's statue to Woodside for electric traction at a cost (exclusive of cars) 21,400l.

**PULPIT, CHURCH OF THE SACRED HEART, EXETER.**—A pulpit, together with a new altar rail and sanctuary steps, have just been fixed at the Roman Catholic Church of the Sacred Heart, South street, Exeter. The sanctuary steps are three in number, and of polished Devonshire marble. On the first step, which breaks out into the nave, is the altar rail of similar stone. Each side is divided by

— A gold medal was given in recognition of the fact that the student obtained first place in the examination for three consecutive years.

piers into five compartments. The pulpit is composed of Derbyshire and Devonshire marble and Beer stone. It is moulded, and in the niches are statues of the evangelists—Saints Matthew, Mark, Luke, and John—Saints Ambrose, Augustine, Gregory, and Jerome. The pulpit is approached from the east side by a flight of marble steps. The work was designed by Mr. C. E. Ware, and was executed by Mr. H. Read, of Exeter, who is also at work upon a shrine, also designed by Mr. Ware, which will be fixed in the position occupied by the old pulpit.

**"N.A.P." WINDOW IMPROVEMENTS.**—The N.A.P. Window Company have had on view, at 65, Gracechurch-street, full-size examples of their various improvements in windows. The company originally started with the idea of enabling the sash window to be cleaned from the inside of a room without the necessity of standing upon the sills and thus often causing loss of life, but their improvements have extended to fittings of all kinds and purposes, and embrace many forms of sliding and inward opening windows, which latter also greatly facilitate the cultivation of window gardening. At the exhibition referred to the fittings are applied to single and double casements in wood by means of a moveable water bar and double knuckle hinge which enable a window ordinarily opening outwards to be opened into the room for cleaning purposes. Others show the application of the principle to existing sash-windows. Steel casements are treated in the same way. Fanlights—always difficult to manage—are treated with passages, hoppers and stays which enable the lights to be swung inwards for cleaning. Another improvement is the air-tight centres for fanlights, which surmounts the difficulty of covering the straight joint at the centre. Amongst other improvements we noticed also the wet and draught excluder with condensation channel, suitable for French casements, in which the door being opened, no projection remains likely to trip up a person passing through. Other improvements in fittings are shown which exhibit ingenuity and are likely to render window furniture less clumsy than heretofore. A luncheon was given in connection with the exhibition. Mr. W. Youlten (managing director of the company) presided. The Chairman having submitted the toast of "The Queen," Mr. J. Starkie Gardiner, in response to the toast of "The (New) N.A.P. Window Company, Limited," said he was induced to support the syndicate from the philanthropic side of the question, as he felt very strongly that the accidents caused by window cleaning ought to be if not prevented, at all events reduced in number. The Chairman said that for some time past the present syndicate had been unable to cope with the work offered it. During the last year or two he had been approached by people to form a company on a large scale, but all along he had desired to wait until the trial tests had proved successful. Now this has been accomplished, a new company would be floated, and the subscribers would have the satisfaction of knowing that the inventions which the company was to acquire had given every satisfaction to experts and to users. In answer to circulars issued to architects asking for their opinion, the company had been sent the replies received by architects from their clients who had proved the advantages of the N.A.P. window, and the effect of the opinions was that the clients could not understand why the N.A.P. windows had not been used throughout. Mr. William O'Malley gave the toast of the Chairman. Mr. E. H. Smith supported the toast, and Mr. Youlten, in acknowledging the compliment, stated that from the first he had had the flattering support of some of the most eminent men in the building trade. The proceedings shortly after terminated.

**ABERDEEN ART EXHIBITION.**—The ninth exhibition of pictures and sculpture in connexion with the Aberdeen Artists' Society was opened in the Art Gallery on Tuesday. Including loan and permanent collection, there are over 600 exhibits.

## CAPITAL AND LABOUR.

**SWANSEA CORPORATION MASONS.**—Mr. Geo. Bell, the Borough Surveyor, reported at a meeting of the Corporation on the 27th ult. that the Swansea Corporation recently that he had received a letter from the secretary of the Masons' Society, asking that the wages of the masons under the Corporation should be in accordance with the Trades Union rate—8½d. per hour. The Borough Surveyor recommended that this rate be paid as from the date of the recent masons' strike. Alderman Leeder, who presided, thought that the men would be sorry if the increase were granted, as it would lead to more work being let by contract. The masons' request was granted.

## LEGAL.

**CASE UNDER THE LONDON BUILDING ACT.**

At the North London Police-court, Messrs. Peck & Forecast, the owners of the "Kenton Arms," Kenton-road, South Hackney, were summoned, at the instance of the London County Council, for



erecting a structure in connexion with the public-house beyond the general building line.—Mr. Chilvers appeared for the Council and Mr. Disney, barrister, was for the defendants.—The facts were singular. At the public-house a lavatory had existed which was approached from one of the bars. The licensing justices objected to this, and selected a spot at the end of the wall of the garden of the house for a new convenience to be erected. The Hackney Vestry approved, and the structure was erected under the supervision of Mr. Alexander Payne, the District Surveyor, who duly received his fees. A builder who did not get the contract, however, discovered that the structure was beyond the general building line in Kenton-road, and he complained. Then Mr. Payne sent in a notice of irregularity.—Mr. Disney said that if there had been any infringement it had been done with the sanction of an officer of the Council. An existing wall had simply been raised from 5 ft. to 8 ft. A door had been provided, and another wall had been built inside.—Mr. Chilvers contended that the convenience was clearly a structure within the meaning of the Act, although he admitted that the footpath had not been encroached upon by the alteration. The structure was, nevertheless, 5 ft. beyond the general line.—Mr. Bros imposed a penalty of 40s., with 2s. costs.—*Morning Advertiser.*

## MEETINGS.

FRIDAY, OCTOBER 7.

*Architectural Association.*—President's Opening Address and Distribution of Prizes. 7.30 p.m.

MONDAY, OCTOBER 10.

*University College.*—Professor Roger Smith on "Students' Difficulties." 7.30 p.m.

TUESDAY, OCTOBER 11.

*Northampton Institute, Clerkenwell.*—Mr. F. Bond on "Origin of Romanesque." 8 p.m.

THURSDAY, OCTOBER 13.

*Carpenters' Hall, London Wall (Free Lectures on Building and Sanitary Construction).*—Professor T. Ross Smith on "Site, Foundations, and Sanitary Requirements." 7.30 p.m.

FRIDAY, OCTOBER 14.

*Institute of Junior Engineers (Westminster Palace Hotel).*—Annual General Meeting: Council's Report, Election of Officers for Eighteenth Session, &c. 8 p.m.  
*Glasgow and West of Scotland Technical College (Architectural Craftsmen's Society).*—Mr. J. Jardine on "Life as a Mason of Works in the Gold Coast." 8 p.m.  
*Architectural Association.*—Discussion Session.—Mr. C. F. Mallows on Church "Restoration." 7 p.m.

## RECENT PATENTS.

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to inspection until November 14

[1897.] 30,371.—*SAFETY SPIRIT BURNER AND COOKING APPARATUS.*—*J. H. & J. Mathie.*—To obviate the use of fluid spirit in the burner, a quantity of compressed air is forced through a valve of the liquid fuel, whose also, or similar vapour rises through a thin layer of asbestos wool or fabric placed upon the cotton wool; a further covering of wire gauze, with a vapour igniter, is placed over the asbestos wool. Air is supplied through a tube in the container which holds the cotton wool, and the flame extinguishes the "Bunsen" flame as occasion requires.

[20,834]—*ARC LAMPS.*—*J. D. F. Andrus.*—The invention comprises (a) the combination of a long solenoid, a long lamp, and a long dash pot to act continuously without gearing through or over feeding rings of the carbons; (b) the construction of an arc-enclosing globe having an inner lining of mica or glass to minimise the darkening of the glass; (c) the combination of a core, guide tube, and globe; and (d) an arc-lamp with a core and solenoid and globe wherein the lower carbon is fixed, and the core and globe being suspended on opposite ends of a cord passed over pulleys to retain the arc in a nearly fixed position.

[992]—*THAWING FROST OUT OF LAND, STONE, DR., &c.*—*P. Watt.*—Hot air, with or without steam, is impelled where required by mechanical means; or produced by a fan, worked by hand or motor, or driven through fuel down a generator through a series of ball-jointed pipes which direct the flame and air upon the mass to be thawed.

[24,313]—*GRILL-BLOCKS FOR USE WITH GIRDERS AND PROPS.*—*J. C. Cadman & J. T. Hinchall.*—The metal grill-blocks have a grooved or ledged portion at each of their ends so that they may be readily laid on to the flanges of the girders before the ends of the latter are placed on the props, a tapering metal bolt, or wedge, being inserted through a hole or slot in the block and secured by a nut. The blocks may also be formed in two halves, to be joined by bolts.

[24,673]—*WATER WASTE PREVENTERS.*—*J. H. Harris.*—The apparatus consists of a cistern and a syphon whose longer leg is so placed that the upper end of the discharge pipe and rocks about a pivot so that it can be slightly raised from the seat; by this arrangement, when the longer leg is raised, water will flow beyond its lower end to start a syphonical action which continues until after the syphon has returned to its normal position and until the water level is reduced to a point whereat air is admitted into the syphon's shorter leg; the syphon is adjusted to the load ball lever in such a manner that when the chain is pulled down the syphon raises the lever and causes the valve to shut off the water as long as the chain is held down.

[24,673]—*SHOWER BATHS.*—*A. H. W. Weller.*—The water is led into the side of the distributing chamber, within which it centrifugally revolves, and then passes out through a nozzle in the cap of the exit pipe; thus are

provided a regular and even shower with ready means of clearing the rose; the appliance can be adapted for overhead baths, or for attachment to a flexible hose.

[25,383]—*GULLEY TRAPS.*—*J. Shaw.*—The trap has an inner receptacle and grate; the inner cover has legs that rest upon the bottom of the shell, leaving a space between the raised outlet and the top of the cover to allow the water to flow over into the mouth of the drain and to form a water seal.

[26,605]—*CONSTRUCTION OF WALLS, CEILINGS, FLOORS, &c.*—*M. Warnock.*—For fire-proof and insulating walls, floors, &c., the inventor uses a perforated sheet metal-plate so bent that a series of closely-jointed triangles are made the bases of the triangles lie alternately on the top and bottom and form continuous surfaces, the whole constituting a supporting base divided into air chambers, which are closed by joining the corners of the triangles; for circulation of air the inner sides of the triangles are perforated, their bases also are perforated, and the edges perforated thereby are bent hook-wise in order to hold the cement.

[1898] 8,366.—*ATTACHMENT OF DOOR-KNOS TO THEIR SPINDLES.*—*H. J. A. Whipple & L. T. Snow.*—On the neck of the knob is placed an adjusting sleeve which bears, at its inner end, against an adjusting screw in the rose and is engaged at its outer end by a depressible detent and the sleeve has, at its outer end, a series of depressions or notches of progressively increasing depth, and the detent is placed within a recess in the neck of the outer part, having a stem or shank which enters a socket extending transversely into the neck and spindle, whilst a spring, between the shank and the bottom of the socket, exerts outward pressure against the detent, so that the shoulder at the detent's inner end fills either one of the notches in the sleeve when made to register therewith.

[10,766]—*BRICKWORK FOUNDATIONS OR SETTINGS AND COVERINGS OF BOILERS AND FURNACES.*—*C. W. Thomas.*—The claim is for (a) making the contact portions of the brickwork foundation or setting of an acute angular edge or tipped construction and forming the faces of the adjacent brickwork at a sharp and acute angle or bevel, so that only a line of brickwork contact to the boiler is presented; (b) covering or arching over the crown of a boiler or furnace, when fixed, with tiles or slabs having angular edges; and (c) a combination of the foregoing improvements.

[12,500]—*WATER-CLOSETS.*—*F. Ferracuti.*—The improvement lies in the adoption of curved pipes or conduits for supplying three columns of water discharge; one column flows by a passage extending above and around the pan interior, and another holes in its lower part through which the water gushes out in small jets, another passes by a tube terminating at the bottom of the pan in a fan-shaped opening, and the third column passes by two tubes branching out on the pan's sides, and so to the bottom thereof. The inventor says that his contrivance "does not require a special reservoir with accompanying apparatus, such as the syphon and automatic valve and adjuncts hitherto used."

[12,943]—*ORDINARY SCREW DOWN TAPS.*—*S. A. Parkes & O. H. Wagner.*—The invention has for its object the construction of a follower valve in the lower part of an ordinary screw-down tap or stop-cock, the top of the lower valve having a guide pin from each face, one to ride in a lower stem of the ordinary upper valve, and the other to ride in a hole made for it in the bottom closing plug, so that the follower valve has free vertical up and down play, thus, on removal of the ordinary valve for repair the follower valve closes the water passage.

[16,097]—*KEY LOCKS.*—*T. J. Dickinson.*—The essential feature of the contrivance consists in providing a hinge leaf at one edge of the escutcheon plate of a mortised lock, adapting it to fold over the plate and close the key-hole, and fitting it with a transverse slot for engagement with the key's shank, whereby the key is prevented from turning in the lock. The hinged leaf is locked in position by a gravity latch pivoted thereto, which engages a catch upon the face of the door.

[17,166]—*COUNTING DEVICES FOR CRANES, &c.*—*P. J. Johnson.*—For recording the movements of a crane, and so counting its loads, is arranged a four on the under side of the platform, which depresses a bar supported by a spring, and a roller on its upper end; the motions of the bar are transmitted to a spigot wheel, so that at each of two motions of the bar a unit wheel attached to the spigot wheel causes another figure to appear, and after a complete revolution of the unit wheel the ten wheel is turned one figure forwards by means of a gear. The count is preferably arranged so that two strokes of the presser bar are needed to move the wheel a whole number; it is then possible to read off the number of loads, that is of double motions of the crane, no figure appearing for the return motions.

## NEW APPLICATIONS.

September 10-24.

19,794, Mackie & Sutton, Friction and Lever Clutch.  
19,799, A. H. Parker, Water Supply for a Lathe Grinding-wheel.  
19,801, J. B. de Alaragay, and 19,974, F. Dannert, Filaments for Electrical Lamps.  
19,809, D. Thomson, Oven Doors.  
19,811, Harley & Dargie, Wire-rope Grains.  
19,813, J. France, Flints and other Coverings for Pipes.  
19,815, J. G. B. Cornwell, File-cutting Machines.  
19,827, B. H. Pomeroy, Electrical Arc Lamps and Controlled Motors.  
19,830, Crawford, Water and other Steam, and Taps.  
19,835, H. Fullwood, and 20,055, B. T. Smith, Door Stops and Checks.  
19,838, J. Strachan, Hydrant for Street Water Mains.  
19,841, McIntire, 19,882, Jones & Phillips, 20,122, B. H. Wallin & Baron R. de Wendel, and 20,127, E. Pellaton, Generation of Acetylene Gas.  
19,845, La Société Roy & Ruyter, Electrodes.  
19,862, M. Barth, Collapsible Ladders.  
19,867, F. Baker, Spike and Holdfast for Securing Piling, Rails, &c.  
19,874, G. Max Sommer, Oiling Apparatus.  
19,875, J. A. Neill, Joint for Electrical Wires.  
19,888, F. Higgarly, Flooring or Paving Composition.  
19,908, M. Gautier, Automatic Flush-hat for Sanitary or other Purposes.  
19,913, Manhattan General Construction Co., and 20,068, H. G. Cuthworth, Arc Lamps.  
19,915, W. Jennings, Raising Gravel, Earth, &c.  
19,916, E. Chatham, Mortar-grinding Mills.  
19,920, J. S. Clinch, Pipe Joint.  
19,925, J. A. Whitehead, Workmen's Time Recorder.  
19,934, C. M. Green, Nail-driving Machine.  
19,939, E. H. Haskins, Electrical Motors.  
19,957, E. Selzer, Electrical Gas-lighters.  
19,964, C. Pellet, Poles, Posts, Masts, &c.  
19,973, R. Friedrich, Folding-elephant.  
19,986, Bon & Allen, Recogitative Gas-lamps.  
19,988, N. Spence, Sanitary Dog Kennels.  
20,005, Staley & Fisker, Dies for Mangle Paper Sanitary Pipes.  
20,016, A. J. Thurman, Barrel and Similar Taps.  
20,017, L. Pierson, Gas Ignition.  
20,025, W. Durrant and 20,217,

J. Walker, Gulleys, Traps, &c.  
20,036, A. Well, Cement Roofing Tile Presses.  
20,037, R. Lokesch, Imitation Enamels.  
20,039, T. Thornton and 20,147, Taylors, Circular-saw Guards.  
20,047, La Société Weeger Aîné et ses Fils & P. E. Guibillon, Process for Rendering Paints, Paintings, &c., indelible.  
20,075, Herriotts, 20,077, J. 20,165, W. E. Hipping, Weighing-machines.  
20,077, J. Astley, Head Varnishing Brushes.  
20,098, J. Hopper's Sanitary-pipe Joint.  
20,100, C. H. Temple, Printing Designs on Tiles.  
20,101, W. Youten, Weather-checks for Casements and Doors.  
20,109, E. T. Smith, Window-sash Fastener.  
20,114, R. Kowalski, Chimney Cows.  
20,115, W. P. Thompson, Pressed Wood or Wood and Composition Panels, Brackets, &c.  
20,116, R. H. Reeves, Purification of Sewage Effluents.  
20,124, J. H. Ellis, Marking, Cutting, and Mortice Gauges.  
20,125, Shone & Ault, Pneumatic Lifting Apparatus for Water, Sewage, &c.; and Partial Purification thereof.  
20,140, A. R. Jenkins, Apparatus for Watering Streets and Similar Purposes.  
20,146, B. de Swantowski, Digging-machine.  
20,160, W. Wood, Lubricating Brick Dies for Making Bricks, Tiles, or Blocks.  
20,168, C. Armstrong, Buffers and Fittings of Tilting Tanks for Waste Water-closets.  
20,171, E. Mathieson, Decorative, Artistic, or other Painted Devices.  
20,180, Cains & Grant-Morris, Facing or Planing Wood and other Materials.  
20,181, C. Andrews, Treatment of Sewage.  
20,201, W. Parsons, Casement Moulds for Door Fastener.  
20,202, E. Peyton, Moulds for Foundry and other Casting Purposes.  
20,215, Carlidge & Wade, Kilns.  
20,223, J. Bishop, French Polish.  
20,226, T. W. Twyford, Bulvers and similar Sinks.  
20,230, Coles, Fixing Posts, Rails, and Similar Structures.  
20,230-7, W. T. Moss, Compasses or Dividers.  
20,245, McNeice & Robinson, Window Sashes.  
20,249, W. Build, Burglar Alarms.  
20,255, Dransfield & Yardley, Chisels for Cutting and Working Stone or Similar Substances.  
20,268, L. A. Martin, Flexible Pipes.  
20,273, E. Verbeke, Bunsen Burners.  
20,277, H. Adler, Tubes.  
20,278, J. F. Golding, Metallic Shells or Strips.

## SOME RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

September 16.—By BOULTON & COOPER (at Helmsley).  
Wombledon, Yorks.—Various enclosures of land, with houses and cottages thereon, 85 a. 2 r. 6 p. f. (in lots) ..... £5,781 10s.  
A freehold farmhouse and 97 a. 2 r. 32 p. f. .... £700  
September 21.—By Wm. HOWLETT (at Great Yarmouth).  
Belton, Suffolk.—The Elm Grove Estate, 96 a. 2 r. 0 p. f., &c. .... 3,900  
By R. C. WARRINER (at Lancaster).  
Ellel, Lancs.—The Ellel Hall Estate, 171 a. 3 r. 22 p. f., &c. .... 14,150  
"The Whittle and Steel" p. h. f., &c. .... 1,290  
By DRIVER & CO. (at Ebrington).  
Wethersfield, Essex.—Two freehold cottages and o. a. 21. 21 p. f. .... 350  
September 22.—By W. H. SHINER & WINTER (at Bristol).  
Whitchurch, Somerset.—Eight enclosures of pasture, 50 a. 2 r. 6 p. f., &c. .... 3,200  
Keynsham, Somerset.—An enclosure of pasture, 6 a. 2 r. 37 p. f., &c. .... 265  
By SIMMONS & SON (at Banbury).  
Great Bourton, Oxon.—Pewell Farm, 97 a. 2 r. 20 p. f., &c. .... 3,350  
By C. W. MOORE.  
Bromley-by-Bow.—36 to 44 (even) Fern-st., u.t. 784 yds., g.t. 784. 15s. .... 1,000  
Poplar.—21, Pennyfields, and 1 and 2, Elizabeth cottages, c. .... 305  
Upper East Smithfield.—No. 13 f., &c. .... 580  
September 23.—By NOTT & CRAWFORTH.  
Belgravia.—81, Westbourne-st., 224 yds., g.t. 54, f. 404. .... 300  
Balham.—30, Balham-grove, u.t. 81. 8s., g.t. 324. .... 285  
132, Bedford Hill-rd., u.t. 77 yds., g.t. 161, e.t. 551. .... 600  
September 23.—By J. KYTROW (at Exeter).  
St. Gennys, Cornwall.—The Crackington Manor Estate, together with Trevigie and Pengol Farms, 2,086 a. 0 r. 27 p. f., &c. .... 18,200  
September 24.—By BRUTON, KNOWLES & CO. (at Gloucester).  
Down Hatherley, Glos.—The Park Farm, 111 a. 3 r. 31 p. f., &c. .... 2,600  
Eastington, Glos.—Alkerton Grange, and 4 a. 0 r. 13 p. f., &c. .... 1,010  
Claypit Farm, 156 a. 1 r. 38 p. f., &c. .... 2,520  
A freehold holding, 15 a. 3 r. 38 p. f., &c. .... 600  
Two houses and garden plot, 2 a. 1 r. 19 p. f., &c. .... 104  
Four enclosures of meadow, 29 a. 2 r. 1 p. f., &c. .... 1,205  
September 26.—By Wm. HOUGHTON.  
Stoke Newington.—89, Cazenove-rd., u.t. 784 yds., g.t. 144. .... 1,015  
Walthamstow.—92, Wood-st., and cottage adjoining, f. .... 395  
By J. C. PLATT.  
Hammer-smith.—2 and 4, Great Church-lane, f., e.t. 654. .... 800  
15, Green-rd., and 10, Chancery-st., u.t. 36 yds., g.t. 81. .... 315  
Chiswick.—7, Arlington Park-gardens North, u.t. 784 yds., g.t. 74. 7s., e.t. 404. .... 400  
By THOMAS WOODS.  
Southall Green, Middlesex.—19 to 26, Denmark-ter., u.t. 64 yds., g.t. 424, f. 264. .... 3,245  
Western-rd., u.t. 60 yds., g.t. 51, f. 324. .... 405  
5, 6, and 7, Alexandra Villas, u.t. 66 yds., g.t. 121, f. 771. .... 660  
5 to 10, Denmark Cottages, u.t. 66 yds., g.t. 121. .... 550  
11 to 29, Dagmar-rd., u.t. 66 yds., g.t. 444. .... 2,205  
Norwood Green, Middlesex.—1, Harewood-ter., and stables, cart and cow houses adjoining, u.t. 66 yds., g.t. 234, f. 34. 8s. .... 270  
North Hyde, Middlesex.—2 to 4 and 9 to 19, Rose Cottages, u.t. 78 yds., g.t. 174. .... 615  
By CASTLETON & GIBBINGS (at Carlisle).  
Hayton, Cumberland.—Fenton Lane End Farm, 46 a. f., &c. .... 950  
September 27.—By H. DONALDSON & SON.  
Stoke Newington.—17 to 27 (odd), Shakespeare-rd., u.t. 584 yds., g.t. 254. .... 1,490



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premi- ums.	Designs to be delivered.
Covered Market, &c.	Aberdeen Corp.	20 guineas.	Dec. 1
Pump Room	Harrington Corp.	50, 30, and 20 guineas.	Jan. 2, '99

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Street, Blackheath, Durham	Bentley & Co. U.D.C.	J. Dixon, Surv. Durham	Oct. 12
Meeting & Mechanics Hall	Rotherham T.C.	Boro Surv. Town Hall	do.
Additions to Presbyterian School	W. R. Richardson, Ind.	Arch. Alcock	do.
Water	Arch. Order of	W. H. Bell, Archt. Newbury	do.
Six Cottages, Kingsley, Berks	Foresters	G. W. Ayton, Surv.	do.
Asphalt & Cement, &c., Washington	Chester & Street, D.C.	Chas. R. Street	do.
Durham	Blackburn U.D.C.	G. B. Latham, Town Hall	Oct. 13
Broken Gurnsey Granite	Committee	T. W. Lewis, 106, Holborn	do.
Church and Schoolroom, Tynemouth	Committee	Barry Dox	do.
Road Barry Dock	Committee	Mr. W. Ogden, Union Offices	do.
Alterations to Butler House &c.	Crumphall Workhouse	Manchester	do.
Two Cottages, Rickland, Newing	Dorset	W. H. Prescott, C.E. Market	do.
Sewerage Works	Eccles (Lancs.) Corp.	R. Longman, Bailwood	do.
Filter	Reigate U.D.C.	B. Hopkinson & Co. Archt.	do.
Cottage Homes, Charlton, Kent	Elham Union	Craven Bank-chambers	do.
Road Works, Broomhill Estates, Invergowrie, Kelshy	Norfolk C.C.	T. B. Heaton, C.E. Norwich	Oct. 14
Steel and Iron Bridge, East Harling	Southend U.D.C.	J. G. H. & Co. Surv.	do.
Public Baths	Freston Corp.	Surv. Town Hall	do.
Faving Works, &c., &c.	Gravesend T.C.	W. J. Fletcher, Archt.	do.
Rowing Club Buildings	Wandsworth T.C.	By J. Bradshaw, Archt.	Oct. 15
Five Cottages Alphen, Lymington	Manning Trustees	Manning Trustees	do.
Alterations to Chapel, Trellick	Brighouse Corp.	M. M. Fowler, C.E. Man-	do.
Sewerage Works, Contracts 8, 9, & 10	Brighouse Corp.	Chas. R. Street	do.
Village, St. Peter's, Acrofton	Westmorland C.C.	Castle Hill, Lancaster	do.
Consignments, Elm, Fulwood, near	Westmorland C.C.	Bentley & Co. U.D.C.	do.
Whideland Road, Kendal	Westmorland C.C.	J. B. B. & Co. Surv.	do.
Road Works, Whitby-on-Wye, Here-	Wansley Corp.	R. Wright	do.
Buildings, Chimney, &c., &c.	R. Wright	Gloucester Corp.	do.
Electric Lighthouse Station	Gloucester Corp.	Tunbridge Wells Corp.	do.
Mosses, Aylesbury, Essex	Gloucester Corp.	Houses, Northampton	do.
Cast Iron Pipes, 1,429 tons	Houses, Northampton	Barnet U.D.C.	do.
Fifty-three Cottages	Barnet U.D.C.	Wansley Corp.	do.
Houses, Northampton	Wansley Corp.	Postpool U.D.C.	do.
Gravel, and 100 tons	Postpool U.D.C.	County School Govern-	do.
Cast-iron Pipes, 12,000 lbs.	County School Govern-	Leith Sch. Bd.	do.
Palating, &c., Town Hall	Leith Sch. Bd.	Wesleyan	do.
Additions to House, Brynhyfryd	Wesleyan	Leyton U.D.C.	do.
Public House, Portlough	Leyton U.D.C.	Governors	do.
Additions to Schools, Lorne-street	Governors	Lancaster R.D.C.	do.
Church, Bolton-road, Darwen	Lancaster R.D.C.	Cummins, H.M. Works	do.
Widening Road	Cummins, H.M. Works	Fulham Vestry	do.
Additions to Howell's County Schools	Fulham Vestry	By F. W. Wansley	do.
Assembly Hall, Llandudno	By F. W. Wansley	Belfast and Co. Down	do.
Stone Bridge, Newhouse Burn	Belfast and Co. Down	By C. W. Davies	do.
Enlargement of Telegraph Factory	By C. W. Davies	By C. W. Davies	do.
Stables, Coach-house, &c., Newcastle	By C. W. Davies	By C. W. Davies	do.
Masonic Buildings, Camber	By C. W. Davies	By C. W. Davies	do.
Pairing, &c., Tate Livery, South	By C. W. Davies	By C. W. Davies	do.
Lambeth Road	By C. W. Davies	By C. W. Davies	do.
Reservoir, Horeahouse, Ballyvaughan	By C. W. Davies	By C. W. Davies	do.
Sewerage Works	By C. W. Davies	By C. W. Davies	do.
Repairs and Alterations at School	By C. W. Davies	By C. W. Davies	do.
Additions and Alterations to Vestry	By C. W. Davies	By C. W. Davies	do.

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
*101 Gully Gratings	Bethnal Green Vestry	P. W. Barratt, Vestry Hall	Oct. 20
Asylum Additions, Chobley, near	Wallingford	G. T. Hine, Archt. 15, Par-	do.
Offices, Oronon, near Halifax	J. Drake & Son	liament-st. Westminster,	do.
Revers, &c.	Wimslow (Cheshire)	M. Hall, Archt. 20 North	Oct. 21
*County Offices, Trowbridge	Wimslow	St. Mary's, South	do.
*Various Stores	G. W. By. Co.	W. C. Woodman, Archt.	Oct. 23
*Makingsup Three Streets	Goodley U.D.C.	W. C. Woodman, Archt.	Oct. 4
*Public Slopers Baths	Ratcliffe Vestry	G. E. Holman, 6, King's	do.
*Public Hall and Offices	Llaphadoc U.D.C.	Bank, Wals. Temple, E.C.	do.
*Gas Engrs. &c.	London County Council	Steele & Reay, Octagon	do.
Schools, Locking-road	West-to-uper Marsh B.	Chambers, Milton street,	do.
School, Chobley-road	Wansley	Bd. Spring	do.
*Engine and Pump, Cuddeon, Pipes	Chobley R.D.C.	Engineers' Dept. Spring	Oct. 27
*Sewerage Works	Dart Corp.	Gardens, S.W.	do.
*Islemary and Administrative Block	Horsham Union	S. J. Wilde, Archt. Weston	Oct. 28
Hotel	Brewster, Ltd.	J. T. Breezy, Archt. 70,	do.
Fire Bricks, Varnish, &c.	G. W. By. Co.	Bulphagat-st. Wiltm.	do.
Manston, Cornwall	H. W. Booth, Archt.	do.	do.
Schools	Elland S.B.	H. W. Booth, Archt.	do.
Pulling-down Theatre and Shops	St. Albans Union Gdns	H. W. Booth, Archt.	do.
London, Liverpool	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Shop, Stores, &c., &c., &c.	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Houses, Russell-street, Carlisle	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Two Villas, Ripon-road, Harrogate	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Villas, Portlough Park, Barry	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Three Terrace Houses, Whitby	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Stone Staircase at Workhouse	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Additions to Grammar School	St. Albans Union Gdns	H. W. Booth, Archt.	do.
House, North Walsingham	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Sewer, West Marston-road	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Private Street Works	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Wokingham Roadway, Avington	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Warehouse, Nottingham	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Business Premises, Parliament-street	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Warehouse, Nottingham	St. Albans Union Gdns	H. W. Booth, Archt.	do.
House, Whitthorpe Hall Estate	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Eight Shops, &c., Walsingham, Bradford	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Convent and Refuge, Newmarket	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Hotel, Dyke, Tisbury	St. Albans Union Gdns	H. W. Booth, Archt.	do.
Promenade Extension, West Bank	St. Albans Union Gdns	H. W. Booth, Archt.	do.
School, Vester, &c., Stanhope-road	St. Albans Union Gdns	H. W. Booth, Archt.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applica- tions to be made by.
*Surveyor and Inspector of Nuisances	Winton U.D.C.	140, per ann. no. combined	Oct. 14
*Building Inspector	Winton U.D.C.	140, per ann. no. combined	Oct. 14
*Time and Storekeeper	Winton U.D.C.	140, per ann. no. combined	Oct. 14
*Surveyor Assistant	Winton U.D.C.	140, per ann. no. combined	Oct. 14
*Engineer, Surveyor, and Sanitary	Winton U.D.C.	140, per ann. no. combined	Oct. 14
*General Engineering Assistant	Winton U.D.C.	140, per ann. no. combined	Oct. 14
*Building Inspector	Winton U.D.C.	140, per ann. no. combined	Oct. 14

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, v, vii, & xix. Public Appointments, pp. xvii, & xix.

Dalton, -9, Fassett-sq., u.t. 53 yrs., g.r. 44, 10s., c.r. 304.	5300	11, 13, 15, and 17, St. Peter's-rd., u.t. 48 yrs., g.r. 204.	£930	By FLEWETT, SONS, & ADAMS (at Masons' Hall Tavern).
Finsbury Pk.-319, Seven Sisters-rd., u.t. 64 yrs., g.r. 304.	1,950	26 and 28, Mall-rd., u.t. 604 yrs., g.r. 244, r. 104.	800	Battersea-Haines-st., "The Prince Alfred" p.h., profit rent of 354, u.t. 234 yrs., with reversion.
Highbury, -35, Calabry-rd., u.t. 864 yrs., g.r. 84, r. 124.	580	51, Farnce-rd., also g.r. 44, reversion in 66 yrs.	2,990	Kingsland-rd., Nos. 485 to 493 (odd); also 30, 32, 34, Stamford-rd., and "The De Beauvoir Arms" p.h., u.t. 21 yrs., g.r. 214, r. 2854.
124, Calabry-rd., u.t. 90 yrs., g.r. 84, 2s., c.r. 9, Roseleigh-rd., u.t. 81 yrs., g.r. 84, 10s., c.r. 554.	525	157, 157A, and 157B, High-rd., f. r. 1104.	2,445	145, By Messrs. COBB (at Rochester).
By C. W. DAVIES.				
Barnsbury, -40, Offord-rd., u.t. 504 yrs., g.r. 94, r. 604.	570	88, Bishop's-rd., u.t. 78 yrs., g.r. 64, r. 344.	320	Strood, Kent.—Brompton-lane Field, 2 a. 2 r. 23 p. f.
Caledonian-rd., -40 and 42, Benetons-rd., u.t. 44 yrs., g.r. 124, r. 684.	560	Kennington-18, Archel-rd., u.t. 784 yrs., g.r. 54.	340	Cuxton, Kent.—Ampthorpe Cottage, f. r. 145.
Islington, -186, Downham-rd., u.t. 42 yrs., g.r. 54, 5s., r. 454.	475	By OSBORN & MERCER.		By LANGRIDGE & FREEMAN (at Tunbridge Wells).
Hoxton, -129, New North-rd., u.t. 21 yrs., g.r. 304, r. 484.	110	Westbourne, &c., Sussex.—The Adden Park Estate; also The Grange and Stains farms, 600 a. 2 r. 17 p. f.	19,500	Burwash, Sussex.—Pond Farm, 68 a. 0 r. 22 p. f.
137, New North-rd., with a timber yard, u.t. 204 yrs., g.r. 404, r. 244.	335	Funtington, Sussex.—Four freehold cottages, blacksmith's shop, and o. a. r. 8 p., r. 254.	620	By WARD & CHOWEN (at Ockhampton).
Stoke Newington, -10, Winstons-rd., u.t. 64 yrs., g.r. 54, 10s., r. 324.	375	By ORGILL, MARKS, & ORGILL (at Masons' Hall Tavern).		New Lew, Devon.—A freehold shopping estate, area 905 a.
Hornsey, -4, Beresford-rd., u.t. 93 yrs., g.r. 64, 6s., r. 344.	870	Southend-on-Sea, Essex.—Hamlet-rd., "The Cliff Hotel," f. with goodwill.	33,360	By WARD & CHOWEN (at Ockhampton).
Hammersmith, -33, 35, 37, and 39, Bradmore Pk.-rd., u.t. 65 yrs., g.r. 164.		By J. HART BRIDGES & SONS (at Masons' Hall Tavern).		By WARD & CHOWEN (at Ockhampton).

Contracts used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; p. for leasehold; a. for estimated rental; u.t. for unexpired term; p. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; for, for term; cres. for crescent; yd. for yard, &c.



CARDIFF.—For the construction of street and sewer works, for the Corporation, Mr. W. HARPER, C.E., Town Hall, Cardiff:—

d.
o
o
o
9
3
3
6
o
o
o
3
o
3
o
7
9

ow  
for  
on

335  
300  
875  
800  
600  
550

**MENBOROUGH (Yorks).**—For sewerage, &c., Simpson-place, for the Urban District Council. Mr. G. F. Carter, C.E., Council Officer, Mexborough:—  
W. Hobson ..... £315 8 6 | G. Eyrre, Sheffield\* ..... £345 15 6  
T. Rothery ..... 399 10 0 | \* Accepted.

**MIDDLESBROUGH.**—For alterations to chapel, Brugham, street. Mr. W. G. Roberts, architect, 61, Albert-road, Middlesbrough:—

Full tender.  
Allison Bros. .... £255 0 | W. A. King ..... £190 0  
W. Thompson ..... 259 5 |

Jointly.  
W. A. King ..... £170 | Hudson Bros., Middlesbrough (accepted) ..... £104

Broken.  
W. Pounder ..... £59 16 | D. Doughty (accepted) ..... £43 0

**NANTWICH.**—For the execution of water-supply works, Spun-stow, for the Rural District Council. Mr. J. A. Davenport, C.E., 15, Hosking-street, Nantwich:—

Pipe Laying.  
Rowland ..... £390 0 | Dodd ..... £101 5 0  
Towett ..... 301 10 0 | Dale ..... 189 9 6  
Small & Co. .... 237 15 6 | Dodd ..... 179 11 6  
Birchall ..... 191 10 0 | T. Wood, Southam ..... 179 11 6  
Greedy ..... 193 0 0 | road, Crews ..... 164 10 0  
Newbale ..... 191 15 0 |

Pipe and Spigots.  
D. Parsons, Brerley Hill.\*  
Fittings and Valves.  
Blakeborough & Co., Brigham.\*  
\* Accepted.

**SHEFFIELD.**—For additions to St. John's Church, Chapel-town. Mr. W. J. Yates, architect, Hoyland, near Barnsley, Lancashire by architect:—

Masonry.—R. Marnden, Chapel-town, near Sheffield.  
Roof ..... £631 0  
Joinery.—G. Cook, Hoyland Common, near Barnsley ..... 256 12 0  
Slatting.—G. Calvert, Ecclesfield, near Sheffield ..... 77 17  
Plastering.—J. MacFarlane, Hoyland, near Barnsley ..... 44 0  
Painting, &c.—J. Snowden & Son, Market-street, Barnsley ..... 133 10 0  
Total ..... £1,452 19

**SOUTHEAST-ON-SEA.**—For the erection of a small house in Preston-road, West Cliff, Southeast-on-Sea, for Mr. J. Parker, Messrs. Clark & Hutchinson, architects, 23, John-street, Bedford-row, W.C.:—  
J. L. Scheffer ..... £675 | R. Gooch ..... £840

**TAMWORTH.**—For the supply of 3,000 tons broken granite, for the Rural District Council. Mr. H. J. Carron, C.E., 25, Church-street, Tamworth:—

	Average price per ton.
Barlow & Son, Glascote, Tamworth*	6 0
Nugent & Sons, Tamworth*	6 0
Mountsorrell Granite Co. ....	6 0
C. Auld ..... ..	6 0
Narsons and Enderby Granite Co. ....	6 0
Rosley Hall Granite Co. ....	6 0
Ford & Hudson ..... ..	6 0
Ellis & Everard ..... ..	6 0
W. H. Murray & Co. ....	6 0

\* Accepted.

**TUNBRIDGE WELLS.**—For the erection of the lower portion of St. John's-road Free Church, comprising lecture hall, class rooms, kitchen, offices, &c. Mr. H. Y. Coley, architect. Quantities by Mr. H. Elwig:—  
Sprange & Sons ..... £3,445 | J. Jarvis ..... £2,689  
W. & F. Penn ..... 2,364 | J. Smith ..... 1,109  
J. Crates ..... 2,380 | J. Marshall ..... 1,897

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
Telephone, No. 74 Holborn. Tele. Address: "SNEWIN, London."

**WALTHAMSTOW.**—For the erection of school buildings, Queen's-gate, for the School Board. Mr. W. A. Longmore, architect, 3, Great Alie-street, London, E.  
J. A. Reed ..... £28 65 | J. Carter, Gays, Essex\* ..... £20,270  
C. Gray Hill ..... 20,970 | \* Accepted.  
Meridew & Wort ..... 20,274 |

**WHITLEY (Northumberland).**—For widening, &c., Manne Avenue, for the Urban District Council. Mr. J. P. Spencer, C.E., Newcastle-on-Tyne:—  
Geo. Maughan, Jarrold-on-Tyne, schedule of prices.

**REBUILDING SHOPS, POWIS STREET, WOOLWICH.**—In the list of tenders for this work, sent in on our last issue, it was stated that the tender of Mr. Cheshire had been accepted. This was an error, for which we are not responsible. The tender of Mr. J. Chapman, Liverpool road, N., was accepted at £2,159.

### TO CORRESPONDENTS.

W. E. W. J. W. (Below our limit).—M. & B. B. J. F. W. (Amounts should have been stated).—W.C. (We do not think your suggestion can be regarded as coming within the region of practical building operations).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum (10 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., &c., per annum. Remittances payable to DOUGLAS FOURDRINIER should be addressed to the publisher of "THE BUILDER," No. 45, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 10s. per annum (10 numbers) or 4s. 6d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

### HIGH-CLASS JOINERY, LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,  
GREENHOUSES,  
WOODEN BUILDINGS,  
Bank, Office, & Shop Fittings.  
CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## THE BATH STONE FIRMS, Ltd.

BATH,  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

### HAM HILL STONE DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Traak & Son  
The Doulting Stone Co.).  
Chief Office:—Norton, Stoke-under-Ham,  
Somerset.  
London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

Asphalte.—The Scysse and Metallic Lava  
Asphalte Company (Mr. H. Glenn), Office, 42,  
Poultry, E.C.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-room  
granaries, tun-rooms, and terraces. Asphalte  
Contractors to the Forth Bridge Co. [ADVZ.]

SPRAGUE & CO., Ltd.,  
PHOTOLITHOGRAPHERS,  
4 and 5, East Harding-street,  
Fetter-lane, E.C. [ADVZ.]

QUANTITIES, &c., LITHOGRAPHED  
accurately and with despatch.

METCHIM & SON (ST. GEORGE'S WESTMINSTER)  
"QUANTITY SURVEYORS' DIARY AND TABLES,"  
For 1898, price 6d. post 7d. In leather 1/- Post 1/4 [ADVZ.]

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

SLATES, SLABWORK,  
Enamelled Slate,  
Marble,  
Permanent Green Slates.

WORKS:  
Bow, London, E. and  
Aberllefenny, North Wales.  
BRANCH HOUSE:  
37, Victoria-street, Bristol.

## PILKINGTON & CO

(ESTABLISHED 1838),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.  
Telephone No., 2751 Avenue

## Polonceau Asphalte.

PATENT ASPHALTE and FELT ROOFING.  
ACID-RESISTING ASPHALTE.  
WHITE SILICA PAVING  
SEYSSSEL ASPHALTE.

W. DUFFY'S PATENT  
IMMOVABLE ACME  
WOOD BLOCK FLOORING.  
THE PERFECT FLOORING FOR ALL PURPOSES.

Seven Gold Medals, four Silver, two Bronze Medals, and Certificate of Sanitary Institute of Great Britain.

Full Particulars and Prices on application to  
THE ACME WOOD FLOORING COMPANY, LTD.  
Chief Offices and Works: Gainsborough Road, Victoria Park, London, N.E.



## ILLUSTRATIONS.

Cartoons for Decoration: "Study of Angels" and "The Sorrowing Magdalene." By Mr. N. H. J. Westlake .....	Double-Page Ink-Photo.
Church of St. Peter, Barnsley, Yorks.—Mr. Temple Moore, Architect .....	Single-Page Ink-Photo.
Christ Church, Moss Side, Manchester.—Mr. W. Cecil Hardisty, Architect .....	Single-Page Ink-Photo.
"Northanger," Godalming: North Front .....	
"Northanger," Godalming: The Hall .....	Two Single-Page Ink-Photos.
"Cliff Towers."—Mr. C. Harrison Townsend, F.R.I.B.A., Architect .....	Double-Page Photo-Litho.

## Blocks in Text.

"Northanger," Godalming .....	Page 248	Sketches of Interiors, "Cliff Towers" .....	Page 343
"Cliff Towers": General View from Garden .....			Page 343

## CONTENTS.

The Sanitary Inspector and His Work .....	329	Designs for Decorative Paintings .....	348	Obituary .....	348
Some Points in Modern Architectural Design .....	331	St. Peter's Church, Barnsley, Yorks. ....	348	General Building News .....	348
At the New Gallery .....	332	Christ Church, Moss Side, Manchester ..	349	Sanitary and Engineering News .....	353
Notes .....	331	"Northanger," near Godalming .....	343	Stained Glass and Decoration .....	356
Health Exhibition, Birmingham .....	332	Cliff Towers, Salcombe, Devonshire .....	343	Foreign .....	359
The Architectural Association .....	334	The Architectural Association School of Design .....	344	Miscellaneous .....	356
Magazines and Reviews .....	340	Applications under the 1894 London Building Act .....	345	Capital and Labour .....	351
Competitions .....	341	Books Received .....	345	Legal .....	351
The London County Council .....	341	"The Scarcity of Water" .....	347	Meetings .....	352
Architectural Societies .....	341	Warning to Architects .....	347	Recent Patents .....	352
Engineering Societies .....	341	The Students' Column.—Sound, Light and Heat. XVI. ....	347	Some Recent Sales of Property .....	353

### The Sanitary Inspector and His Work.



FROM time immemorial the profession of those whose aim it is to cure the sick and arrest the progress of disease has very properly commanded universal respect, and it is strange that, although the adage, "Prevention is better than cure," is one of our most popular proverbs, yet the profession of those whose object it is to prevent sickness and disease by detecting and removing its causes is held by the people in comparatively light esteem. It is common to hear Londoners speak with pride of the sanitary condition of their immense town, and of its consequent freedom from those decimating epidemics which from time to time struck down its inhabitants in former times; but while recognising the value of the results of improved sanitary conditions, the public too often underrate the importance of securing sanitary officers of high calibre, and allow their representatives to employ inspectors at salaries which often deter the most able from offering their services, and which in some cases are so low as to invite bribery, corruption, and neglect of duty.

Disagreeable and obnoxious as the duty of the sanitary inspector often is, it is of the greatest importance to the whole community that it should be carried out faithfully and intelligently. Too frequently it is the duty of the inspector to demand reform in the face of the influential opposition of some prominent members of his District Council or Sanitary Committee, who owns local low-class house property that is more profitable than savoury; and under such circumstances it is not a matter for great surprise if the under-paid official succumbs to the temptation to shut his eyes and avoid reporting on the condition of the dismal street which eventually forms the centre of a wide-spread area of epidemical disease. It is true that the Medical Officer of Health is usually a fairly-paid official of intelligence and probity, but he is neces-

sarily almost entirely dependent upon his inspectors for knowledge as to the sanitary condition of a great part of his district; and the experience, vigilance, and intelligence required to detect and properly rectify sanitary faults before they produce disastrous results, is considerable.

The time has long since passed when an uneducated man with a little knowledge of plumbing and drain-laying was considered sufficiently qualified for the office of sanitary inspector, and thanks to the work of the Sanitary Institute and other scientific and educational societies, the *personnel* of the sanitary inspector is rapidly rising; and the time is evidently not far distant when sanitation will take that prominent position in the public regard and estimation, and that foremost rank among the sciences, which it deserves on account of its vital importance to man. And as the tendency of the human race to crowd together in congested groups over the surface of the earth becomes more pronounced, so will the vital necessity of increasing attention to sanitation become more and more evident. The beneficial effect of efficient sanitation is happily no longer a matter of question or doubt with the vast majority of our population; although the recent events in Bombay, where the natives rose to oppose the introduction of sanitary improvements, may remind us of the opposition which was frequently aroused even in our own country against many sanitary improvements in the earlier years of the present century. In most of the large British towns the increased consideration given by the public to sanitary matters is evidenced by the fact that even the jerry-builder considers it necessary to pay special attention—in his advertisements, at least—to his drainage and water supply; and the gradually increasing practice of requiring a sanitary examination of a newly acquired residence by a competent authority before taking possession, is a hopeful sign of further progress.

Among architects and the better class of builders the advantage of building upon suitable soil and providing as perfect a system of drainage and ventilation as possible has long been recognised, and the desirability of a knowledge of the principles

which regulate practical sanitation is recognised by architectural societies; but even the most experienced architects are (very rightly) glad to avail themselves, from time to time, of the practical knowledge of the sanitary inspector in connexion with sanitary fittings and drain testing.

The annual Congress of the Sanitary Institute, which every year attracts the interest of a larger section of the English-speaking world, is of great value in recording the advances in sanitary knowledge, in preventing sanitary retrogression, and demonstrating the utility of still greater efforts to obtain sanitary reforms. The recent Congress at Birmingham was well worthy of its predecessors both in general interest and in scientific value, and thanks to the Press the words of warning uttered by Sir Joseph Fayrer in his inaugural address will be read throughout the length and breadth of the land, and tend to disabuse those minds which are inclined to undue satisfaction with the present achievements of sanitation. "Tainted water is still drunk," said Sir Joseph, "chimneys still vomit forth their smoke and chemical fumes, rivers are still polluted, cesspools and imperfect drains, badly constructed, ill-ventilated houses, and so on, still defy alike the sanitary law and common sense." And Sir Joseph's plea for more complete organisation of the public health administration under a Minister of Public Health will be warmly applauded by those who recognise in cleanliness and purity of air and food, factors which have an important influence not merely upon the preservation of life, but also upon the happiness, and physical and moral condition of the nation.

But in order to gain the full benefit of sanitary legislation, whether of the present or the future, it is necessary that the men who are entrusted with the work of enforcing reforms should be men of ability, integrity, and energy; and as such they should be paid. The lives of rich and poor alike are to a certain extent dependent upon the efficiency of the public sanitary staff, and to pay the ridiculously small salaries sometimes offered to the candidates for a sanitary appointment is a pusillanimous and foolish practice which cannot be too strongly condemned.

## SOME POINTS IN MODERN ARCHITECTURAL DESIGN.

**T**HE opening meeting of the School of Design of the Architectural Association, on Tuesday evening last, ought to be memorable to all those who were present for the admirable little lecture, at once broad in principle and practical in detail, given to the students by Mr. Aston Webb. In a kindly conversational manner, and with the aid of an occasional diagram on the blackboard, Mr. Webb gave a most lucid and useful exposition of some of the main principles in the planning of public buildings more especially, with some additional remarks on the different conditions in regard to private dwelling houses. We give on another page a résumé of his remarks, and need not therefore dwell on them in detail here. But we should like to emphasise the importance of the principle which Mr. Webb laid down, that the main idea of the plan of a building—we might perhaps say its block plan, is the first thing to be settled and organised in the mind, before going into the details of the arrangement of the plan. That main idea is in fact the soul of the building; unless that is settled in the first place in a broad and comprehensive manner, the building will want a leading idea, and no ingenuity in the arrangement of the details of the plan will make up for the want of that leading idea.

We may add a word on one point touched on by Mr. Webb. In illustrating the importance of alignment and centralisation of buildings, he instanced the example of Buckingham Palace, which is placed off the centre of axis of the Mall which leads up to it; an arrangement (or want of arrangement) which, as he says, has a very weak effect. It may be of interest to mention that old Buckingham House, which occupied part of the site of the present palace, and was the forerunner of it, was central with the Mall. People were more particular about axial lines a century ago in England than they have been in recent times; we will not say that they are now, for just now and quite recently attention seems to have been turned to the subject again; architects have succeeded in forcing it on the perception of the public more or less. But in the Grace collection in the British Museum, Buckingham House, built in the eighteenth century, is shown, in a drawing made early in the present century, as a mansion with a square central block, and a lower wing on each side connected with the central block by quadrants. In front of it was a courtyard with a fountain in the centre, and from it stretched the main avenue of the Mall, central with the house, with the then long canal-like lake of St. James's Park running parallel with the road. Early in the century Nash altered the house, but without changing its axis, and in front of it erected the Marble Arch, forming a terminating object to the Mall and a state entrance to the courtyard. Many persons in London are probably not aware that the Marble Arch was originally erected for this purpose and in a position where it must have been very effective and had an architectural *raison d'être*. When Blomfield altered and enlarged the palace towards the middle of the century, the Marble Arch was removed, and was then (characteristically) placed in its present position, where it pre-

tends to be an entrance to the park, through which, however, no one enters, and has no central road leading up to it from either side.

In regard to the planning of public buildings, and Mr. Webb's remarks on the necessity of making the plan such that the public could plainly see where to go, we may take the opportunity of urging that in regard to the Town Clerk's office in a municipal building, which is the general office of inquiry for the public, and the medium of communication with the municipal authorities, it is not enough that the office should be easy to find; it should require no finding. We have always considered that the Town Clerk's public office in such a building should be as central and obvious, and as impossible to miss, as the booking-office (for example) of a large railway terminus usually is; it should be the first and central object opposite the main entrance; but we cannot remember ever to have seen a Town Hall in which this was fully realised.

Mr. Fellowes Prynne, in his address to the students, went into a much larger subject, and endeavoured to indicate in what direction architecture and the study of design might best be followed in the present day. We may refer the reader to his division of the followers of architecture into three camps, and the remarks he made upon each, with the spirit of which remarks we are in general quite in agreement. We refer to them here in order to add two points to the cause of Mr. Prynne's argument. In the first place, in regard to what he called the "Arts and Crafts" school, who wish, as he says, to begin over again by stripping buildings bare of all detail, in order to evolve a new detail from the requirements or natural tendencies of the craftsmen. Those who propose that wildgoose chase do not seem to see that they are in this dilemma: either they must resolve to shut their eyes absolutely to all the buildings of the past that remain, and be ignorant of their existence—which is practically impossible; or, when they begin to make new detail for their buildings, they must find themselves, whether they will or no, influenced by the existing details of architecture. It is impossible to escape from it; the human intellect is not made so that it can remain uninfluenced by what is before it, or that it can evolve at will an absolutely new train of ideas and treatment. That has never been done in this world, and never will be.

Another point we would suggest is, as to the possibility of originality even while adopting more or less the detail of a past style. We have one notable example in the Houses of Parliament, which is certainly an entirely original building, though with an imitation of Tudor detail (to order). We may see it exemplified in the English cathedrals, in which the same details, at the same period, are found everywhere; yet each of the cathedrals has its own individual design and produces its own individual impression. But it may be put more strongly than that. Suppose, for example, that Peterborough Cathedral had never been erected. Suppose a modern architect to have specially studied and adopted Gothic detail as his chosen style to work in, as people did frankly during the Gothic revival; suppose, to put the case in the strongest manner, he had even adopted Gothic detail in the most conservative spirit of imitation—would that be any bar, if such

a man had a great church to build, to his conceiving and carrying out such an idea as the front of Peterborough; a front with three immense arches and flanking towers? And even supposing all his detail could be traced to Gothic text-books, would not that, nevertheless, be a piece of original architectural design?

It is in the main idea that great and original architecture really consists; not in the details.

## AT THE NEW GALLERY.

**T**HE autumn exhibition of the New Gallery consists of the rather singular combination of modern French pictures with antique and Renaissance bric-à-brac, coupled also with a small quantity of modern French decorative work which is of considerable interest.

We seem unable ever to get a really representative exhibition of modern French painting in London; and conversely, no doubt, it may be said that the French never get a representative exhibition of English painting in Paris; but they do not make any such attempt, and we do. The Guildhall collection was an interesting and fine one, but certainly not representative of the contemporary or earlier work of the century. The New Gallery exhibition contains some fine works, a good many mediocrities, and only two or three that can be said to represent contemporary French painting at its best. Among these is Mme. Demont-Breton's beautiful work, "Dans l'eau bleue," here translated "In the azure sea" (why "azure"? surely "blue" is good enough English); and M. Raphael Collin's "Awakening," a nude subject in his refined and idealised style, always characteristic of his work, but not so interesting and poetically suggestive as some of his figures of the same class; and is not the right knee a little too high? His life-size "Portrait of a young lady" too, is hardly justice either to himself or the lady; the figure and the tree alike seem rather wooden. The portraits are rather a curious set; the best in the whole collection is M. Benjamin-Constant's "Portrait of Anna, aunt of the artist," which stands out among the line of portraits by this artist as escaping the quality of hardness which characterises all the rest. M. Laurens' portrait of his son has character enough, though it is so oddly stiff and solemn that one doubts whether to take it in earnest. However, it is at all events not hard, which is the besetting sin in French portraiture at present, as we see again in M. Issoncourt's portrait of Mme. Demont-Breton, interesting from the reputation and the striking and individual expression of the sitter, but in itself not a remarkable work. Taking English and French portrait-painting all round, we can show better than our neighbours at present in that branch of art.

In landscape, again, it is to be regretted that nothing is here which exhibits the highest achievements of the great modern school of French landscape-painting. M. Demont's "Wreckage" is a fine gloomy seaside picture, but marred by the over-powering solidity of the clouds; M. Rapin's "Autumn" comes indeed very near to the best, and is a beautiful work, but just marred by a touch of sentimentalism, a suspicion of theatrical effect. There are some other good landscapes, M. Bernier's "Pool in Brittany" one of the best; but the only one which



really represents something of the first order in its way is M. Tattegrain's small but perfectly balanced work, "Cast up by the Sea," which we noticed in our account of this year's Salon. His larger picture, "Herrings," is spoiled by a bad sea, though the figures are admirable.

The few exhibits of modern French decorative work are, as we have observed, of some interest. The catalogue, which seems to have been rather carelessly made up, names five cases of this class of work in the North Room, distinguished by letters of the alphabet; but there are really only three, and with no distinguishing letters; the cards of the respective artists are, however, inserted. We presume that these represent personal work and not manufacture. The case of objects by M. Feuillâtre belongs to that kind of work, so peculiarly French, in which one is more impressed by the material beauty and finish of the work than by anything suggestive or thoughtful in the design; but in some of them the material beauty is very great—a delight to the sense of sight; as for instance in the glass vase (No. 1) with orchids and a network of golden-looking leaves in translucent enamel ("on gold" according to the catalogue; we presume "on glass" is intended); and the modelled orchid, a mere *objet de luxe*, in translucent enamel on gold and silver. This is a fairy-like bit of work, but it has no value in the sense of design. The case of M. René Foy's work contains some beautiful workmanship, and the "Fuchsia" waistband buckle (translucent enamel on silver and pearls) and the "Pinks" buckle (wrought silver) have a finish and leafy softness which will be beguiling to the ladies for whose dresses they are made, but these too are more *objets de luxe* than art; too naturalistic also—the fuchsia one especially, with its dog-legged twig contradicting all one's feelings as to line in ornamental work. The best thing in this case is the small brooch with a little carved head at the top, half hidden among the windings of the metal, and a pendant pearl at the bottom; this is a bit of thoughtful design.\* The case of enamels designed and executed by Mr. George Fouquet contains a good deal of detail design in metal, of a semi-architectural character, in that peculiar clever and pointed modern French style which characterises, for instance, good deal of the detail of the Paris Opera House—symmetrical and clean in line, but totally devoid of feeling. The brooch with a little nude figure in ivory half embedded in a flower is however, a charming fancy most delicately executed; and there is a lady's necklace or watch chain (its purpose is not quite apparent) which is a truly exquisite bit of design and workmanship; the chain consisting of miniature tablets with scrolls on them punctuated by gold dots, and with enamel filling, and with a small jewel intervening in the link connexions. This is a real piece of artistic design in bijouterie.

The South Room contains the rather multifarious assortment of antique and Renaissance work lent by Signor Bardini, of Florence. Some fine things are to be found in the collection; notably two altar frontals, one of fifteenth-century work, a bold symmetrical floral design, with a frieze or border of architectural canopies and figure

subjects, not very suitable to needle-work; the other a piece of sixteenth-century work of the greatest elaboration and beauty, symmetrical in general design but with the freedom of line in details which suits with this class of work, and with a powerfully designed border of bolder foliage, which may be compared advantageously with the architectural border of the other example. Several marble busts by Bernini, those of "Summer" and "Autumn" especially, have an undeniable vigour though in a pretentious style; and a series of Persian carpets, of which the last in the set (No. 138) is the finest, are effectively contrasted with a Florentine tapestry from a design by Ubertini, hung in the middle; a thing very much resembling a design for a Renaissance stained-glass window, and forming, in its delicate design and rather weak colour, an effective set-off to the rich colouring and naïve design of the Persian work. Among the cases in the room the most notable exhibit is a bronze group of Samson overthrowing the Philistines, by Cellini, said to be after a model in wax by Michelangelo, and looking very like it.

The cases in the West Room contain a medley of antique objects of rather unequal interest, but with some fine things here and there. The catalogue here again does not answer to the exhibits; two of the cases not appearing at all in it, and one of them, containing a miscellaneous collection of bronzes, being described as "Four French Bronze Groups and Majolica," there not being a single piece of majolica in it. In the Central Hall are two cases of majolica, good work though including nothing of exceptional interest, a case of old musical instruments and some interesting MSS. of old music, and a statuette of "Flora" by M. Delacour, a perfectly charming figure in modelling and attitude, which was exhibited in the Salon of 1895. It is not in the catalogue and seems to have got here by a happy accident, being the only work of its class in the exhibition.

On the whole, therefore, the collection of decorative work has rather the appearance of a medley, the result of an effort to get together enough to make an exhibition, without any definite aim or any principle of arrangement or selection.

#### NOTES.

Municipal  
Telephone.

IN the Report of the Select Committee on Telephones issued last August it was stated that "general, immediate, and effective competition" by either the Post Office or Local Authorities against the unregulated monopoly of the National Telephone Company was imperative. The Post Office has in the meantime shown no inclination to seriously compete with the company, and so the Glasgow Corporation have applied for, and have obtained from the Postal Authorities, a licence to establish a municipal telephone service. The London County Council also, last Tuesday, agreed to ask the Postmaster-General whether he intended to take the necessary steps to establish an efficient telephone service for London, independent of the National Telephone Company. In the event of his refusal they will ask for a licence to establish a municipal service, but they agree with the Select Committee in thinking that a really efficient Post Office service would be

the best. It will be remembered that in the report of the Telephone Committee they said that they had no doubt that a telephone service by Municipal Authorities would be as successful as has been the supply of gas, water, tramways, and electric light. This in our opinion is a very doubtful proposition. A licence is only granted to Local Authorities for some twelve years, and there is then no obligation on the Post Office to take over either the Municipality's or the company's undertaking at a valuation. The Local Authorities thus risk their capital; and they are also precluded, by the terms of their licence, from carrying on the service with a view to lighten the burden of local taxation. One can understand why the Post Office authorities, who get a 10 per cent. royalty on the gross receipts and run no risk, prefer to let municipalities develop telephony. We wish well to those public-spirited municipalities who are taking up telephony, as the whole question will be discussed when they apply for Parliamentary powers.

Rural Water Supply. THE shortness of water in the rural districts, owing to the dry weather of the last winter

and summer is little less, in many places, than a public calamity. Wells which are usually relied on to supply villages are dry, and water has to be fetched from long distances, and even paid for. It is to be hoped that this general and noteworthy scarcity may draw attention to the need for a better system in rural districts. The storage of rain-water is almost wholly neglected; thus a small and occasional rainfall, which would help towards the supply if stored, is absolutely lost. It never reaches the springs and wells. Again, it would not be difficult in many places to establish a small company, which would sink a good well and supply the district. Parish councils may also do much by keeping wells clean, and by establishing communications between villages and deep and distant wells, to improve the supply in the more populous rural districts. Nothing can, of course, compensate for the absence of a really constant supply, which cannot be expected in other than populous districts. On the other hand the present state of things in rural districts might be greatly improved.

M. HOMOLLE, in the issue of the "Bulletin de Corr. Hellénique" referred to in our Notes last

week, gives a detailed analysis and discussion of the remarkable acanthus column surmounted by dancing caryatids. The column, it will be remembered, was published in the *Gazette des Beaux-Arts*, 1895, but since that publication many fragments have been added, and the monument is now certainly one of the most curious and interesting architectural discoveries made of recent years. M. Homolle thinks the style cannot be earlier than the second half of the fifth century B.C.; certain archaic peculiarities in the treatment of hair, eyelids, and chin in the faces of the dancers prevent its being dated any later. The question remains of its explanation and the motive of its dedication. It seems to have stood on the terrace of the temple of Apollo. The figures of the dancers in their short chitons are thoroughly Dorian, and suggest Sparta. They must be of the type of the *Lacœnae saltantes*. The acanthus plant, by the sort of heraldic pun so popular among the Greeks, sug-

\* We cannot refer to any title in the catalogue, which does not seem to answer to the contents of the case, nor are the objects numbered, though there are numbers in the catalogue.



gests the Thracian city of Acanthus, and M. Homolle is probably right in seeing in this curious and beautiful column an *ex-voto* in memory of the alliance concluded between the Spartan general Brasidas and the town of Acanthus during his Thracian campaign.

A Duban  
Architectural  
Scholarship.

MME. MAILLOT, the widow of the late Théodore Maillot and daughter of the eminent French architect Duban, has presented to the French Académie des Beaux-Arts a sum of 50,000 francs, the interest of which is to go, every year, under the conditions hereafter mentioned, to the architectural student who obtains the "Grand Prix de Rome"; it will be known as the "Prix Félix Duban." The money will not, however, be paid until the return of the student from Rome, and the exhibition of his "envois," among which the last year's work ought, according to the regulations, to include a scheme for the restoration of some important ancient monument. In case the conditions of the Prix de Rome have not been strictly observed, the "Prix Duban" will then go to the student, whether painter, sculptor, or architect, who has best fulfilled the regulations of the "Prix de Rome" studentship. As far as the architectural students are concerned, the effect of this will evidently be to specially encourage attention to the restoration project of an ancient building, on which it seems to us that rather too much stress is laid at present. No doubt restoration schemes emanating from the Villa Medici have included, from time to time, some of the most splendid sets of architectural drawings ever seen. But one result of this new prize evidently will be to encourage the Academic element in French architectural design, which is somewhat too prominent already. It would have been much better to have awarded the Duban prize for the best design for a modern building, as an addition to the ordinary Prix de Rome drawings.

Hampstead Heath.  
The Hampstead Heath Protection Society send us, in a pamphlet form, a report on the condition of the Heath, drawn up at their request by Mr. Robinson, the well-known landscape gardener. We have not very much faith generally in the landscape gardener's view of things; "the artistic and picturesque way in which trees may be planted" is a sentence suggesting a somewhat dangerous development of the artificial picturesque. We quite agree, however, that if fresh trees are planted on the Heath, the preference should be given to native shrubs and trees, and not to "the conventional trees of the nursery" which are planted in parks. We agree also that all the larger natural pools should be kept for their value in point of effect and reflections; as to Mr. Robinson's complaint that the water plants have been destroyed in a mistaken cleaning of the ponds, a complaint which he extends to the case of the ponds allowed to be used for bathing, it appears to us that in such cases a thorough cleaning of the ponds is essential; people do not want to bathe among water plants, however picturesque their appearance may be. In regard to smaller ponds the uncultivated or unclear appearance may be left. We also concur in Mr. Robinson's recommendation to avoid the formation of con-

ventional park or garden paths, which unquestionably would destroy the true character of the Heath. In fact, the general maxim in regard to Hampstead Heath should be—"let well alone."

Drapers' Hall,  
Throgmorton-  
street.

WE are informed that the alterations described in our number of October 1, are being executed under the superintendence of Mr. T. G. Jackson, R.A. All excepting one of the bays of the screen-front in Throgmorton-street have been pulled down; the remaining bay, now occupied by a window, will be converted into a state entrance for use upon festive occasions, in addition to the new chief entrance and the staircase on the Throgmorton-avenue side. The highly decorated stone façade (opposite the Stock Exchange) was designed by Herbert Williams, who, in 1865-70, almost entirely reconstructed the hall, with its inner quadrangle, ladies' chamber, court and livery rooms, and main staircase. The Company, established in 1332, removed from St. Swithin's-lane to Cornhill, and thence, in 1541, to their present site, having bought from Henry VIII. the house and gardens which had belonged, until his attainder, to Thomas Cromwell, Earl of Essex. Stow recounts in his "Survey" how his father's garden there, together with other men's land, was encroached upon, without recompense, by Cromwell for his new house and its pleasure. After the Great Fire the Company's Hall was rebuilt from designs attributed to Edward Jerman; he died in the autumn of 1668, and it is supposed that Cartwright, the mason, completed the work. Robert Adam repaired the interior, and reinstated and decorated the street front, after a fire in 1774. The Drapers have granted a lease of the ground which has been cleared in Throgmorton-street and Throgmorton-avenue, whereon a restaurant and offices are now being built by Messrs. Colls & Sons, from Mr. Charles Reilly's plans and designs. The contractors' tender for the first portion amounted to £38,696. The Drapers' Hall formed General Monk's headquarters in the City in the spring of 1660.

Pictures by  
W. B. Tholen.

THE latest of the interesting exhibitions of the works of modern Dutch painters which have been held from time to time at the Goupil Gallery is the collection, now open, of nearly fifty works by Herr Tholen, an artist whose name is new to us. Their merit is unequal, and the artist seems to be rather in search of a style, some of his pictures looking as if they were modelled on Diaz, others on Corot; a sufficiently eclectic position. But Herr Tholen has feeling for nature and the sense of composition and of the value of breadth and unity of style; qualities admirably exhibited in the largest work here, "Sand Dunes" (38), which is truly and in every sense a picture. Some of his subjects in which buildings are introduced, though the architecture is rather feebly handled in detail, are very picturesque and strongly marked by local character, such as "A Street in Bavaria" (13), an irregular curve of half-timber houses flanking a bare lane with a brook at one side; "Laaren Church" (9) and the "Village of Laaren" (37). Among other works of special interest are the small picture "Sche-

veningen: Waiting" (7), with its dirty green shallow water and the barge waiting for the rising tide—a fine sky too; "Sandy Road" (12) "Children on Sand Dunes" (14); "Watching and Waiting" (15), a wood seen through a large open door where a collie dog sits in the foreground; "Canal House and Boats" (44), an admirable little water-colour; and an interior, "The Workshop" (45), noticeable for the careful study of the stock of odds and ends of timber and other articles, real without being realistic. The exhibition is worth a visit.

Model of the  
Church of the  
Sacré Cœur.

FOR fifteen years two clever decorative sculptors have been at work on a large model of the Church of the Sacré Cœur at Montmartre, Paris, which is intended for the 1900 Exhibition. It is to the scale of the building, and reproduces all the details minutely in the form of a longitudinal section. The most important part of the work is now completed; only the central dome and the large campanile remain to be added, from the drawings, as this portion of the work is not yet actually complete on the building. The tower in the model will reach four metres, or a little over 13 ft. in height. The model is said to be a masterly work of its kind.

#### HEALTH EXHIBITION, BIRMINGHAM.\*

At stall No. 8 the British Sanitary Co., of Glasgow, exhibit several of their excellent automatic earth-closets. The cheapest of these is only a little over 2*l.*, and consists of an unvarnished pine seat and back, galvanised-iron pail, and galvanised mechanism actuated by the removal of the pressure on the seat. These closets deserve to be better known.

Messrs. W. Harriman & Co., Limited, have a good show of drainage appliances at Stall No. 9. Among these are their floor-channels, with inlet sockets at the side, the special feature being that the bottom of the channel and of the side inlet is all on one flat plane. Barron's channel bends for the bottoms of manholes are designed to prevent the splashing of sewage on to the benches at the sides, and also to allow the passage of ordinary drain-plugs. Harriman's grease-trap is of earthenware in four compartments, and gives a large surface of earthenware and a considerable volume of water for the coagulation of grease; a brass plug is placed at the bottom of one side under the overflow, so that the whole of the water in the trap can be run into the drain after the coagulated grease has been removed, this being done with a small wooden shovel.

Messrs. Dibble's "patent sink and automatic waste-water flushing closet" (stall No. 10) has been designed to operate with a very little fall from the sink to the closet. This is a step in the right direction, as it does away with the long shafts under the seat of the closet, which were so objectionable in the earlier forms of waste-water apparatus. The tipper, which is of galvanised iron, may be placed under the sink in the scullery, or in the yard outside, the latter being certainly preferable from a sanitary point of view, as the retention of a body of foul water in the house cannot fail to prove a nuisance at times. When the tipper is placed outside, a special dip-trap is built into the wall between the waste-hole of the sink and the tipper. The water discharged from the latter passes through the necessary length of drain-pipe to a gully under which an ordinary P-trap is set, the outgo of the trap being connected directly with the flushing nozzle of the closet. This is a hopper-closet with a P-trap under it, which can be connected with the drain in the usual way. With this apparatus the floor of the closet need be only about 1 ft. below the floor of the scullery, and the surface of the water in the closet-trap only about 6 in. or 8 in. below the closet-floor. There is considerable merit in the invention.

Messrs. Joseph Sankey & Sons' baths are shown at the next stall. They have an outer

\* Continued from page 317 ante.



shell of steel and a lining of planished copper with highly-finished lined surface. The outside is enamel-painted. The hospital bath is mounted on wheels with rubber tyres, and is therefore practically noiseless, and being very light, can be easily moved about.

Stalls Nos. 12 and 13 contain parts of the exhibits of Messrs. T. Wragg & Sons and Messrs. Doulton & Co., and were alluded to in our last issue. At stall No. 14, Messrs. F. C. Calvert & Co. show their carbolic soaps and disinfectants, carbolic dressings, &c.

Stall No. 15 contains various applications of Mr. W. T. Allen's "revolver," which has nothing to do with gunnery, but is merely a form of tipper which can be used for flushing closets or in flushing-cisterns. The revolver is a receptacle of metal, in shape about three-fourths of a cylinder, but with one lip of the metal turned slightly outwards; when full of water the revolver turns completely round on its axis, discharging the water with great rapidity and without any of the jarring which is inseparable from the ordinary tipper. For closets the revolver is of copper and holds 3 gallons. The flushing-cisterns are of galvanised iron, and the revolvers in these are of the same material. The velocity and volume of the discharge from a flushing-cistern of this kind, discharging 4 gallons only, are compared with those from an ordinary 40-gallon syphonic flushing-tank, by placing an 8-lb. brick in one of a series of latrines; when tested in our presence, the syphonic tank failed to move the brick, but the "revolver" tank shifted it nearly a yard. This tank has been "selected by the judges for further practical trial."

Callender's "pure bitumen damp-course" is exhibited at Stall No. 16. It is well known and can be used for damp-proof courses in walls, reservoirs, swimming-baths, &c., and as a covering for iron pipes laid in the ground. It is also applied to wood or metal lathing for wetrical work in basements and cellars.

One of Riddell's patent filters for the filtration of trade-effluents and other impure water is shown at the next stall, and deserves careful examination. The filter is a steel drum with convex ends, nearly filled with selected sand, through which the water is filtered downwards. By means of ingenious mechanism the sand can be thoroughly cleansed in about five minutes without opening the drum. One 4-ft. drum is said to be capable of purifying about 1,500 gallons of foul water per hour, or 30,000 gallons per day of twenty-four hours.

Messrs. C. Isler & Co. exhibit at Stall No. 18 their tube-well driving apparatus, and at Stall No. 19 is Messrs. Twyford's "Axis" wash-down water-closet the outgo of which is so made that it can be connected with the lead-bend by means of a screw ground joint, brass to brass, no putty or other jointing material being required; the joint is below the water-line of the trap. The "Twyford" syphonic closet has been selected by the judges for further trial; it appears to us to be an excellent closet, and, as it requires only a two-gallon flush, it can be used in the numerous districts where closets requiring a greater quantity of water are forbidden. The water-area in the basin is about 11 in. by 9 in., and the outgo joint is below the water-line and above the floor. A "triple vegetable-sink" is an excellent example of the potter's skill; it is in one piece of enamelled fireclay, measuring 6 ft. by 1 ft. 8 in., and is provided with india-rubber plugs and cleansable overflows. There is also to be seen the "Ideal" sink, which is of enamelled fireclay in two compartments separated by a weir. Among the other exhibits of this firm worthy of notice are an enamelled fireclay butler's sink in three compartments with copper strainers, standing waste, and teak draining-board, the whole in one piece measuring 5 ft. by 2 ft.; the "Inserta" water-closet, the seat of which is formed with two side pieces of wood only, screwed to the top of the basin; the "Corona" lavatory; and the "Whitmore" porcelain bath. Most of the exhibits at this stall are fitted with the necessary plumbing, which is a model of good workmanship.

Dr. Quine's "patent sanitary ash-bin," shown by the Pendleton Sanitary Engineering Company at stall No. 20, is designed for building into the walls of yards, and can be emptied from the street, so that the scavenger need not enter the yard.

Two novel closets are shown at stall No. 22 by Messrs. Evered & Co., one of which has been selected by the judges for further trial. This is described as a "patent pneumatic

closet with automatic seat attachment to valve, and high-pressure closed cistern." The basin is of the wash-down type, and possesses no features of particular interest. The novelty is in the cistern, which is a closed galvanised-iron cylinder holding two gallons of water, and which remains empty until the seat is pushed down. The pressure on the seat actuates a valve, and allows the water in the supply-pipe to flow up the flush-pipe into the cistern, where the contained air is compressed to an extent corresponding with the pressure of the water. With a water pressure of seventy pounds the necessary two gallons will enter the cistern in less than a minute. As soon as the pressure on the seat is withdrawn, the supply-valve closes automatically, and in so doing opens the flush-pipe, down which the compressed air in the cistern forces the water therefrom to the closet-basin with great velocity. It is claimed that, as the inlet and outlet passages cannot both be open at the same time there can never be any waste of water. The other closet is a pedestal valve-closet, the mechanism being placed out of the way under the back portion of the seat, and being operated by pulling the chain of the syphon-cistern, as in the case of wash-out and wash-down closets: the area of the water in the basin is about 9½ in. by 8 in.

Messrs. Adams & Co.'s principal exhibit at stall No. 23 is an installation of their patent sewage-lift, which is designed to raise sewage from a lower to a higher level without pumping. It can be used for raising sewage from basements which are below the level of the adjacent sewers. The same firm exhibit a patent wedge disc-valve or penstock. An ingenious and useful improvement is the "Improved Disconnecting and Inspection Syphon-trap," in which the clearing arm is a direct continuation of the drain, the trap itself being skewed to one side for the purpose. We may also mention the hospital slop-sink with foot-action, the "Helios" urinals, and the glazed-water water-closet cisterns.

Messrs. George Skey & Co. at stall No. 24 exhibit numerous drain-traps, sinks, water-closets, &c., the most notable perhaps being the small "Scientific" closet for infants. Their "Spiralvent" chimney-top has been selected by the judges for further trial. Messrs. Sutton & Co. (stall No. 25) exhibit their very clever "Wyuurst" channels, terminals, and inlets for man-hole bottoms, by the use of which splashing is avoided, and special bends are not required; a slight additional depth of man-hole is necessary, but this is an advantage as far as the flow of sewage through the man-hole is concerned. The "Flush-joint" drain-pipes have Stanford's composition on the end of the spigot as well as around the circumference, and are run with cement-grout, as in Hassall's and other pipes.

Day's "Stafford" waste-water closet is so well known as to need no description. At the next stall (No. 27) Messrs. William Boydell & Sons show their patent street-gully and their patent gate-hanger, which is a plate of iron for building into walls, and intended to supersede hanging-stones.

Mould's patent boiler-bath (stall No. 28) is quite a novelty, having been patented only a few months ago. It is a combined bath and stove, useful for cottages where gas is not laid on, but, as the material throughout is cast iron, there is, we think, some danger of cracking. Folding wood tops are supplied, so that the bath can be used as a table when not required for its proper purpose. It is also claimed for the apparatus that it renders the washhouse furnace unnecessary, as all water required for washing can be boiled in the bath.

At stall No. 29 Mr. John Jones shows his well-known drain-stoppers, both "Bag" and "Screw-expanding," together with his smoke-machine, manhole-covers, traps, and other drainage-appliances, &c. Messrs. Martineau, Beames, & Madeley, at the next stall, have a miscellaneous display of sanitary and fire-extinguishing appliances. They also show a "Self-Heating" soldering iron, which contains a receptacle for benzine or other inflammable liquids, and Pullen's patent paint-lamp, "The Scorching," which has been selected by the judges for further trial.

Messrs. Burn Bros., at stall No. 32, display an excellent assortment of cast-iron drain-pipes, inspection-chambers, bends, traps, &c., as well as their patent expanding drain-stopper, which consists of an indiarubber tube with air-pump, and canvas bags of various sizes for slipping over the tube according to the size of the

drain to be tested; the whole apparatus is very light, and cannot fail to be a great boon to the sanitary inspector and engineer. To architects, however, the most interesting exhibit at this stall is an installation of Messrs. Court & Binny's patent system of hot-water warming apparatus, which consists of a "heater" in which the water is warmed by steam, either "live" or exhaust, and a pump, operated by steam power, for forcing the water through the circulation pipes. The advantages of the system are obvious: smaller pipes may be used, a quicker circulation can be obtained, the temperature throughout the pipe system is more equal, the water can be forced through dips in the pipes without difficulty, and rooms below the "heater" can be served quite as well as rooms above it. This is the first time the apparatus has been shown in England. It has been selected by the judges for further trial, and we have no hesitation in saying that the merits of the system will insure its frequent adoption, especially in large buildings.

Among the next few stalls we noticed the Mansfield ventilators and chimney-pots (which have been selected for further trial), Edwards's patent socket-connexion between lead and earthenware, Cooper's suction-disc for removing obstructions in waste-pipes, and Barraclough's tin-lined lead pipe with asbestos between the two metals, this also being selected for further trial.

Dr. Barr's invention, the "Sterilite" filter is shown by the Sterilite Filter Co. at stall No. 40, and will be further tested by the judges. It is designed to supersede those filters in which fragile "candles" form the filtering media, the variation consisting in the automatic deposition of "Sterilite" on a "coil of stout aluminium wire covered with cambric cloth of special make." Before passing an opinion on the invention we must await the judges' report, but we must say that there appears to us to be danger in trusting blindly a filtering medium deposited automatically, especially when we are told that, notwithstanding the utmost care in manufacture, at least one-third of the Pasteur (Chamberland) "candles" are rejected by the makers, on testing, as being more or less defective.

At succeeding stalls we noticed models and drawings of the Horsfall refuse-furnace, showing recent improvements; Messrs. Thomas Ash & Co.'s "Acme" ventilators (Cooper's patent), selected for further trial, and Jones's patent combination bath, which is very cleverly arranged for use as a bath, sink, "dolly-tub," and table. At stall No. 45 Messrs. Hughes & Lancaster exhibit the well-known Stone hydro-pneumatic ejector for raising sewage, and also an installation of the Fischer system of water-filtration, in which hollow blocks of pervious stoneware, placed in a tank, are the filtering media. It is claimed that an installation of this kind requires only one-eighth of the space required for a sand filter of equal capacity. This apparatus has been selected for further trial. We may mention also the Leeds Art Pottery and Tile Company for their excellent faience, Messrs. Stock, Sons, & Taylors for their hydraulic ram, and Messrs. A. R. Dean & Co. for hot-water and steam radiators.

Messrs. J. Duckett & Son exhibit a simple louvered air-brick (for which a bronze medal seems to us to have been rather unnecessarily awarded) and a set of urinals, glazed with a beautiful amber enamel. Besides their well-known types of waste-water closets, they also show a new form in which the pedestal and trap are above the floor; but this would be all the better if the tipper were designed to discharge three gallons instead of two.

Perhaps the greatest novelty in the exhibition is the installation of Messrs. Kerrill & Hunter's ventilating fans in connexion with closets and urinals. The water required for filling the flushing cisterns is utilised for operating the fans, which are said to extract 200 cubic feet of air per minute with a 60 lbs. pressure of water. The simplicity, ingenuity, and automatic nature of the apparatus deserve high praise.

Mr. David Hurst's "Record Adjustable Automatic" water-closet (stall No. 53) is on the same general lines as Evered's pneumatic closet already described. Messrs. Oates & Green exhibit their cream-glazed stoneware manger and salt-glazed wash tub, and also many other excellent sanitary goods, which lack of space prevents us adequately describing; the rich colour and fine glaze of their salt-glazed ware should, however, be mentioned.

Most of the remaining stalls are occupied



with miscellaneous exhibits which have little or no interest to our readers, but brief mention may be made of the exceptions to this generalisation. Among these are Messrs. Arkinstall Bros.' "Simplex" cinder-sifters; the Adamant Company's opaline, and adamant plaster and chromolith; Orr's "Duresco"; Morton's "Tynecastle" canvas; "Willesden" waterproof papers and canvas; James Jones's reversible window fittings, which are among the simplest, cheapest, and best we have seen; the "Maiche" automatic water-sterilising apparatus; Jackson's "patent self-feeding circulating instantaneous domestic water-boiler"; Stott's mercury gas-governor; J. E. Webb's "Vaillard Desmaroux" water-steriliser; J. Defries & Sons' Pasteur (Chamberland) filters and "Equifex" disinfecting appliances (another interesting exhibit of this firm is Dr. Scurfield's ventilation-indicator); and A. R. Dean's fibrous plaster. At Stall No. 177, among other books, we noticed a book of diagrams, with brief descriptions, on practical hygiene, designed and written by Mr. Knight, the curator of the Exhibition, which should be of use to students and teachers.

We trust that to the students and teachers the Exhibition is full of interest and variety, and well worth a visit from all engaged in the design and construction of buildings.

The following are the awards of the judges in connexion with the Exhibition, omitting those exhibits which it does not come within our province to notice:—

#### Silver Medals.

Adams & Co., Birmingham: Automatic Sewage Lift. Cannon Hollow-ware Company: Bilston, Enamelled Cast Iron.  
J. Defries & Sons, London: Pasteur (Chamberland) Filter.  
J. Defries & Sons, London: "Equifex" Pressure Disinfecting Apparatus.  
Ferrybridge Foundry Company, Ferrybridge: "Fryston" Range.  
Hughes & Lancaster, London: Shone's Hydro-Pneumatic Ejector.  
Maiche, Ltd., London: Automatic Water-Steriliser.  
J. Stott & Co., Oldham: Mercury Gas-governor.  
Jas. E. Webb, London: "Vaillard Desmaroux" Water-Steriliser.

#### Bronze Medals.

The Adamant Company, Birmingham: Adamant Plaster for Walls and Ceilings.  
Adams & Co., Birmingham: Wedge Disc Valve.  
Arkinstall Brothers, Birmingham: "Simplex" Cinder-sifter.  
A. Boake Roberts & Co., London: Liquid Sulphur Dioxide for Disinfection.  
Burn Bros, London: Expanding Drain-Stopper.  
The Cannon Hollow-ware Company, Bilston: The "Chef" Gas Cooker.  
Davis Gas Stove Company, London: Automatic Gas Stove.  
A. R. Dean, Birmingham: Low-pressure Ventilating Radiator.  
A. R. Dean, Birmingham: Fibrous Plaster.  
J. Duckett & Son, Burnley: "Louvre" Air Bricks.  
J. Duckett & Son, Burnley: Enamelled Glazed Urinals.  
Eclipse Brass and Copper Company, Halifax: Jackson's Self-Feeding Water-boiler.  
Farrer, Barber, & Co., Birmingham: The "Helliwell" System of Glazing.  
Farrer, Barber, & Co., Birmingham: Combined Sink and Lavatory.  
Formalin Hygienic Company, London: Formalin.  
W. Harriman & Co., Newcastle-on-Tyne: Floor Channels, with Sockets for Waste Pipes.  
W. Harriman & Co., Newcastle-on-Tyne: Barron's Channel Bends made to pass a Drain Plug.  
James Jones, Birmingham: Reversible Window with Lines and Weights.  
Bernard Kuhn, London: Chinolol.  
Leeds Art Pottery and Tile Company, Leeds: Wall Decorations in Leeds Faience.  
C. A. Line, Birmingham: Willesden Paper.  
C. A. Line, Birmingham: Tynecastle Canvas.  
Mould's Patent Boiler Bath Company, Birmingham: Boiler Bath.  
Newton Chambers & Co., Sheffield: Izal.  
Oates & Green, Halifax: Glazed Stoneware Manger.  
Oates & Green, Halifax: Salt Glazed Wash Tub and Rubber Combined.  
Parker, Winder, & Achurch, Birmingham: Jones Combination Bath.  
Parker, Winder, & Achurch, Birmingham: Ventilated Hot Closet for Eagle Stove.  
Pendleton Sanitary Engineering Company, Manchester: Dr. Quine's Ashbin.  
Rowe, Bros, & Co., Birmingham: Lead Pipe Made in any Length.  
Sanitary Ventilating Syndicate, Dublin: Water-closet Ventilating Fan, worked by high-pressure supply to flushing cistern.  
Shanks & Co., Barrhead: "Perfecto" Lavatory.  
Shanks & Co., Barrhead: "Perfecto" Bath.  
Silicate Paint Company, London: "Duresco."

Stocks, Sons, & Taylor, Birmingham: Hydraulic Ram with Valve.  
Summerscales & Co., Keighley: Washing Machine for Disinfecting under Steam Pressure.  
Sutton & Co., Overseal: Green's "Wyuurst" Channels and Inlets for Manholes.  
Twyford's, Hanley: "Axis" Water-closet, with screw brass joint.  
Twyford's, Hanley: Triple Vegetable Sink.  
Twyford's, Hanley: "Ideal" Sink in two compartments.

#### Deferred for Practical Trial.

Wm. Thomas Allen, Birmingham: Automatic Flushing Tank.  
T. Ash & Co., Birmingham: "Acme" Ventilator.  
A. Barraclough & Co., Heckmondwike: "Eureka" Lead Waterpipe.  
Burn Bros, London: Steam Heater for Hot-water Warming and Supply.  
Burn Bros, London: A Court and Binny's System of Hot-water Warming and Supply.  
J. Duckett & Son, Burnley: Automatic Grease Flusher.  
J. Duckett & Son, Burnley: Automatic Syphon Cistern.  
Evered & Co., London: Automatic Flushing Tank.  
Farrer, Barber, & Co., Birmingham: Automatic Flushing Tank.  
Hughes & Lancaster, London: Fischer System of Water Filtration.  
Geo. Jennings, London: Duplex Supply and Sanitary Waste Valve.  
Mansfield Patents Company, Mansfield: Chimney Pot.  
Mansfield Patents Company, Mansfield: "Mansfield" Ventilator.  
Parker, Winder, & Achurch, Birmingham: "Victoria" Ventilator.  
Parker, Winder, & Achurch, Birmingham: "Empress" Ventilator.  
Parker, Winder, & Achurch, Birmingham: "Standard" Ventilator.  
Plant & Co., Birmingham: Zinc Roofing.  
"Septic" Tank Syndicate, Exeter: "Septic" Tank.  
Shanks & Co., Barrhead: Non-concussion Taps.  
G. Skeg & Co., Tamworth: Spiralvent Chimney Top.  
Sterilite Filter Company, Bury: Sterilite Filters.  
Sutton & Co., Union Pottery, Overseal, near Ashby-de-la-Zouch: Quarries for Heating Drying Sheds.  
Twyford's, Limited, Hanley: "Twycliffe" Syphon Closet.

#### THE ARCHITECTURAL ASSOCIATION:

##### THE PRESIDENT'S ADDRESS.

THE opening meeting of session 1898-99 of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. G. H. Fellowes-Prynn, President, occupying the chair.

##### Annual Report and Balance-sheet.

The minutes of the last meeting having been read and confirmed, the adoption of the annual report and balance-sheet was moved by Mr. Hampden W. Pratt, past President. The report will be found on page 145 and subsequent pages of the new "Brown Book," and from it we learn that eighty-nine new members were elected during the session, fourteen members re-joined, and the losses by death, resignation, and other causes, amounted to thirty-five. The Jubilee Premises Sub-Committee has met from time to time, and it has been decided that before establishing a fund for acquiring new premises it is desirable to formulate some definite scheme, and with this view a well-known surveyor and land agent has been consulted, and steps have been taken to submit to the Committee offers and proposals for suitable sites or premises. By this means it is hoped before long to bring the matter to a practical issue. The report states that the Register of Assistants has again proved of great service to members, the number of applications for assistants being larger than in previous sessions. The educational work has shown an improvement over previous sessions, although there was a slight falling off in the number of students attending some of the classes. The excess of income over expenditure, which has been carried to premises and general fund, was 150l.

Mr. H. W. Pratt, in moving the adoption of the report and balance-sheet, said it was gratifying that the membership at the end of last session was the largest they had ever had, because that not only showed that there was a yearly accession of members, but that old members retained their membership, while there were others who re-joined, and thus old and young combined for the good of the Association. The meetings were well attended last session, and some excellent papers were read. The educational work of the Association was well

maintained, although the number of students fell off slightly. The work done was, on the whole, very good and encouraging. The Committee had had to report again that fewer students went up into the advanced divisions, and that was a source of great dissatisfaction to them, as it must be to them all, and some alteration had been made this year in the divisions, which he hoped would have the desired effect. The probability was that the alteration would increase the attendance in Division I., but he hoped there would be no falling off in Division II. The Studio and the School of Design had been carried on successfully; the Studio, thanks to the enthusiasm and the arduous attention shown by Mr. Lewis; and the School of Design, thanks to the visitors, past presidents, and other eminent members of the profession, who had so kindly and courteously given their assistance in the past as, no doubt, they would in the future. The balance-sheet showed a very satisfactory condition of affairs, and there was a balance on the right side of 150l. The subscriptions were slightly in excess of last year's in consequence of the larger membership. There was another satisfactory fact to mention, and that was that the students' fees for lectures and classes had again been sufficient to pay the lecturers; but there was not a great surplus, and if it were not for the members who derived no educational advantages, the Association would not be able to meet its expenses.

Mr. W. H. Seth-Smith, in seconding the motion, said it was an agreeable duty he had to perform seeing that there was a balance on the right side of the account, as well as a reserve fund for contingencies; and it was particularly easy to second such a motion when it had been moved by their Treasurer, under whose able guidance last session as President the Association had flourished. It was a sad fact that the attendances in the higher division of the curriculum were unsatisfactory. He wished the profession realised more fully that the Association was founded and maintained to encourage the training of *bona fide* architects—of men who were going through a regular course of training in architects' offices. The Association did not pretend to compete with polytechnics and so-called schools of architecture, in which a number of men destined for all kinds of trades, and especially the building trade, went through an architectural course. The Association was particularly for architectural pupils and that class of men, and if principals would bear that in mind, and urge that point more on students who could afford to join the classes, he felt sure there would not be a falling-off in the attendance in the higher division.

Mr. Owen Fleming said he desired to ask three questions, of which he had given the President notice. 1. Were the Committee yet in a position to make any definite statement as to the probable locality of the proposed new premises? 2. Were any, and if so, what provisions to be made in the new premises for the adequate training of students in the scientific handling of materials? 3. Whether it was the intention of the Committee to obtain the approval of the general body before committing the Association to any particular scheme?

The President said he must answer the first question in the negative; the Committee had not decided upon any definite place for the new premises. The other questions were referred to in the address which he was about to deliver.

The motion having been carried, Mr. E. Howley Sim, senior hon. secretary, proposed a vote of thanks to the hon. auditors, Messrs. H. P. G. Meule and J. W. Stonhold.

Mr. G. B. Carvill, hon. secretary, seconded, and the motion was carried.

A long list of nominations having been read, the President announced that the following gentlemen had been reinstated:—Messrs. J. A. Jones, E. A. Rickards, W. N. Richards, A. E. Bartlett, A. F. Gadsdon, and F. H. Lynes.

He also announced that Messrs. Alfred H. Hart and H. A. Satchell had resigned their seats upon the Committee in accordance with the Standing Orders, which require any office-bearer who is appointed to a paid office (lectureships) to resign. These gentlemen, however, submit themselves for re-election.

Mr. Sim announced the following donations to the library:—"Specifications for Building Works," by F. R. Farrow, presented by the Publisher of the *Builder*; "Architecture among the Poets" by H. H. Statham, presented by



B. T. Batsford; "Academy Architecture, 1898," presented by A. Koch; and "Portfolio of Indian Architectural Drawings" (Part I.), presented by E. W. Smith, of the Archaeological Survey of India.

A vote of thanks having been accorded to the donors,

The President announced that the Conversation would be held at the King's Hall on the 21st inst. Several contributors had kindly lent pictures for the occasion, amongst others being Mr. Wyke Bayliss, Mr. Axel Haig, and Mr. H. W. Brewer.

#### Presentation of Prizes, &c.

The President then presented the prizes, medals, and certificates gained during the past session. The following is the full list:—

#### Number of Competitors for the various Prizes.

A.A. Medal	...	9
Measured Drawings Prize	...	8
Essay Prize	...	3
Andrew Oliver Prize	...	3
Architectural Union Company's Prize	...	0
Discussion Section Prize	...	1

A.A. Travelling Studentship, value 25*l.*, and

Bronze Medal, H. F. Waring.

Second Prize, not awarded.

A.A. Medal (Silver Medal and 5*l.* 5*s.*), F. Dare

Clapham.

Second Prize, value 5*l.* 5*s.*, T. Tyrwhitt.

Essay Prize, value 10*l.* 10*s.* and Silver Medal,

F. N. Reckitt.

Measured Drawings Prize, value 5*l.* 5*s.*, A. M.

Torrance.

Hon. Mention, J. G. N. Clift.

Andrew Oliver Prize, value 5*l.* 5*s.*, A. J. Roddis.

Arthur Cates Scholarship, value 10*l.* 10*s.*,

T. Bee.

Discussion Section Prize, not awarded.

Architectural Union Company's Prize, not

awarded.

*Lectures: Division I.—Silver Medal and*

*A.A. Scholarship, value 6*l.* 6*s.*, S. H. Goodwin;*

*Bronze Medal, H. S. Barrett; Hon. Mention, S.*

*Wheeler. Division II.—Silver Medal, T. G.*

*Lucas; Bronze Medal, W. M. Settle; Hon.*

*Mention, H. T. Bromley.*

*Studio: Division I.—Silver Medal and Certificate,*

*not awarded; Bronze Medal and Certificate,*

*C. H. F. Comyn. Division II.—Silver*

*Medal and Certificate, C. E. New; Bronze*

*Medal and Certificate, J. G. N. Clift.*

*ORDER OF MERIT.—Division I.—Greek and*

*Roman Orders.—S. H. Goodwin, Certificate and*

*Book; C. L. Fleming Williams, B. J. McAdam.*

*Elementary Construction.—S. H. Goodwin,*

*Certificate and Book; H. S. Barrett, A. R.*

*Conder. English Architecture.—S. H. Goodwin,*

*Certificate and Book; H. S. Barrett, C.*

*L. Fleming Williams. Elementary Physics,*

*Formulae, and Calculations.—S. H. Goodwin,*

*Certificate and Book; W. J. Davies, Certificate*

*and Book; P. B. Dannatt, S. Wheeler. Plane*

*and Solid Geometry.—S. H. Goodwin, Certificate*

*and Book; A. R. Conder, H. S. Barrett.*

*Mensuration, Land Surveying, and Levelling.*

*S. H. Goodwin, Certificate and Book; P. B.*

*Dannatt, C. Brés.*

*Division II.—Construction.—T. G. Lucas,*

*Certificate and Book; W. M. Settle, L. I. Wood.*

*Materials.—T. G. Lucas, Certificate and Book;*

*R. T. Miller, W. M. Settle. Stresses and Strains.*

*—H. T. Bromley, Certificate; W. H. Collin, Certificate;*

*G. H. Smith, T. G. Lucas. Drainage and*

*Water Supply.—T. G. Lucas, Certificate; W. H.*

*Collin. Ventilation, Lighting, and Heating.—*

*R. T. Miller, Certificate; T. G. Lucas, J. H. A.*

*Phillips. Specifications and Estimates.—J.*

*Ormond, Certificate; M. G. Pechell, F. J. O.*

*Smith. Elementary Class of Design.—Silver*

*Medal, Certificate, and Scholarship value 5*l.* 5*s.*,*

*A. H. Goslett; Bronze Medal and Certificate,*

*R. H. Butterworth; Hon. Mention, G. Bailey,*

*and F. J. Corfield. Advanced Class of Design.—*

*Silver Medal, Certificate, and Scholarship value*

*5*l.* 5*s.* C. L. Brierley; Bronze Medal and*

*Certificate, F. N. Reckitt. Perspective.—L. G.*

*Detmar, Book.*

#### The President's Address.

The President then delivered the following address:—

Gentlemen and Brother Students in Architecture.—In addressing you this evening I feel my first duty is to thank you for electing me to the honoured position of your President for the ensuing year. In accepting that important and responsible position, let me assure you that my heart is thoroughly in my work, and it will be my first and last aim to pass on the good

traditions of this chair unsullied to my successor.

With regard to the custom, your President's Annual Address, it may be looked upon by many as a necessary evil, and, perhaps, by none more so than the President himself. However, custom it is, and I maintain on the whole a healthful custom, as although involving almost necessarily some repetition, it enables us to look at things from a somewhat different point of view, it may open up some further field for thought, and, again, it may perhaps, from year to year, help to inspire or to rekindle enthusiasm for the great work being carried on by the Architectural Association.

Having completed our fifty years' life as an Association, and entering now upon the first session of a new decade, we are in a measure able to review the past with considerable satisfaction, and, with past experience to guide us, to look forward with every hope of even greater success in the future. The very useful review of the history of the Association given in your late President's address renders it, I am glad to say, unnecessary for me to dwell further upon the historical side except only as far as it touches upon the progress in the educational work of the Architectural Association. The first object of the promoters of the Association was perhaps necessarily a somewhat limited one, and it must be a source of no small gratification to Professor Kerr and Mr. Arthur Cates (now our oldest member), and other of the promoters who are still amongst us, to whom we all owe so much, to see the vigorous plant that has grown from the small seed they planted and nourished with so much care fifty years ago. Whilst we should never lose sight of the debt of gratitude we owe to the first promoters of the Architectural Association, yet I feel sure that they will be the first to acknowledge that the good work has been well carried forward by many able workers, to whom we owe an equal debt of gratitude; and more especially to those who were the means of bringing about the great revolution in our mode of work, and launching the new scheme of education.

Useful as the educational work of the Association had been up till 1891, and successful in many ways as had been the results of the noble and generous voluntary support given in teaching and otherwise—and again, whilst it cannot be denied that the enthusiasm inspired amongst students was as great, if not even greater, under the old voluntary system, more especially in such sections as the old Class of Design, yet undoubtedly with the rise of numerous Schools of Art and the demands for systematic education in every branch of art and science, it became absolutely necessary, if we were to maintain our position as an educational body, that our whole system should be worked upon more methodical lines than heretofore; and further that our educational work should not be dependent solely on voluntary effort. How much this great need was felt by those most interested in our welfare, for many years before its accomplishment became possible, is purely a matter of history.

With what care and surprising thoroughness the new scheme was at last launched, and became a living factor for good, under the able direction of our energetic past presidents, Mr. Stokes and Mr. Baggallay, and no less energetic secretaries, Farrow, Gale, and Goldsmith, we have ample evidence in the original Curriculum. This Curriculum was at once simple and comprehensive; and the fact that so few alterations to the original scheme have been found necessary, speaks wonders for the care and insight of its framers. Such changes as have been made from time to time are the outcome of experience in actual working, and that further modifications will have to be made in the near future is more than probable. Good as our start in thorough educational work has been, we do not for a moment think that our system is yet by any means perfect. Indeed, there are palpable deficiencies, and especially as regards the technical and practical branches of our work, upon which I shall say a few words later on.

You will, I hope, agree with me when I say that it is not well that we should always be looking only at the bright side of the picture. There is certainly another side, and it is much better to face it; and as it is a matter that affects the whole body, I trust you will forgive me if I state certain facts concerning the work of the last few sessions.

One of the greatest disappointments is, perhaps, in finding how few students comparatively work through the four years' course proposed by the original and still recommended by the present Curriculum. It is very hard to judge exact results by figures only, as a majority of our students take up various subjects, the Studio work, or special courses of lectures, separately. I will, therefore, not attempt to compare averages, as it would probably be misleading; nevertheless, it is distinctly disappointing to find that out of all the students who have joined during the years 1891 to 1894 and 1895 inclusive, only eighteen have taken the complete four years' course. Of this number seven students commenced their studies in the session 1891-92; five in session 1892-93; five in session 1893-94; one in session 1894-95.

These figures at least indicate that the four years' course is either not generally popular amongst students or otherwise that the majority of students do not, under our present system of pupillage, find it practicable to carry forward a regular four years' course of Architectural Association instruction in addition to their other work; and it must not be forgotten that the more industrious and ambitious students, or those with more time at their disposal, are tempted, and I think wisely so, to join the Royal Academy Schools, and carry on the Royal Academy work conjointly with that of the Association. This in itself may to some extent tell against the success of the four years' course originally proposed. What do we learn from the experience of our various Divisions of work? When the work was divided into four Divisions, it was Divisions III. and IV. that were poorly attended; when the work was re-arranged in three Divisions, it was Division III. that languished, and now that the curriculum is once more modified and excellently arranged for the complete work to be included in two divisions, it is in the advanced classes of Division II. that there is still the greatest falling off. Indeed, so much was this the case during the last session that the Committee have felt that it was desirable to remove the valuable lectures on General History, and those on Stresses and Strains, from Division II. to Division I., and to make Land Surveying, originally in Division I., one of the extra subjects.

This will, perhaps, tend to make the lectures in Division I. still more popular, and we hope at the same time increase the attendance at the remaining classes in Division II. But I am not confident that it will altogether solve the problem as to why it is that the majority of students do not follow on through the advanced classes.

Personally, my view is that, taking into consideration the present system of pupillage and other difficulties that beset the architectural student, a four years' course, unless under a regular college system, is too long, and that a curriculum drawn up for a three years' complete course would be more popular and successful; not that I think four years under regular systematic work too much—*per se*—but when supplemented by office and other work, it becomes impracticable. In saying this, I am aware that it is possible for a student to cram through the lectures and other classes in two years, but in doing so he must miss much of the studio work. This course cannot be too strongly deprecated. That it is resorted to by some as a means of cramming up for and passing the Royal Institute of British Architects' examination in a limited time, is, I regret to say, only too true. Again, it is found that many students, after passing through Division I., go to a private tutor, for getting up the advanced subjects, with the same object. It is, I fear, one of the inevitable evils of this otherwise most useful examination, that students are tempted to consider the passing of this examination the goal of their ambition, and to make the historical, theoretical, and scientific side of architecture the main feature of their studies, too often to the detriment of the practical art and craft side of their education.

Whilst I am most firmly convinced that the reading, the study, and the preparation that is necessary for these examinations is simply invaluable to the student as a means to an end, and that even the examination itself may be, and is, in many cases, an incentive to work, yet one cannot but deplore that the passing of the examination is the end far too often worked for, and not architecture. There are certain peculiarities I have particularly noticed about



the man whose only or principal qualification to being an artist is the passing of the Royal Institute of British Architects examination, as opposed to the artist who uses the examination, as it is intended to be used, as an accessory to his art—the former invariably wants to tell you all about it—he has a wonderful liking to discourse upon his book-learned art to others, and is sublimely critical as to what is and is not correct in style, &c.

For fear of being misunderstood, however, let me repeat that I believe the Royal Institute of British Architects' examinations, within limits, to be a great lever for good, both as an incentive to study, and as a test of study. If these examinations are not, as they never should be considered, or thought of, as a test of art, they may I think in a measure be fairly considered as a certain qualification in the very necessary scientific side of our art. But having said this, I feel I am only expressing the views of all who have interested themselves in the educational work of the Architectural Association when I emphatically assert that in no way whatever do we as an educational body encourage a system of cramming students for the Royal Institute of British Architects, or any other architectural examination; and we most strongly deprecate the idea of our classes being used for that end, to the detriment of the studio work, which, as I have before said, must of necessity be the case, if students attempt to confine their studies to a two years' course. No, gentlemen, the whole scheme of our educational work is based upon a much firmer foundation than is involved in cramming.

It was the aim of the framers of our new scheme, and the great desire of those who have carried on that scheme, to lay a solid foundation of elementary education, and to build up gradually a superstructure, that should be as perfect in its parts as we could make it; and in this system was it, do you think, for one moment desired that historical, theoretical, or even scientific study should be the backbone of the work? Surely not! The studio work, and all that is involved in it, I venture to say, was intended to be the backbone of all other study—and that the subjects therein taught, should throughout be worked conjointly with the lectures, classes, or divisions. It is here that a student will first learn to express his thoughts and ideas with his pencil—it is here that he will learn the beauty, relative proportion, and value of ornament and mouldings—it is here that he will be able to formulate his ideas into actual working formula—it is here that he will be able to test the value of what he has learnt in other sections—and last, but not least, it is in the studio that he will learn the fundamental principles of design, and having gained confidence in himself, will have many unrestricted opportunities of showing that individuality in design which I trust it will ever be the object of the Association to encourage. It is for these reasons I say that the studio work should be considered by our students as the very basis of all other work.

Amongst our many really able instructors, it would seem invidious to pick out any one name, when all, in their particular spheres of work, are so thoroughly good, was it not for the fact, that I am now more particularly dealing with the studio work, but I think all who know Mr. Lewis will agree with me that he is simply *facile princeps* in his position as Studio Instructor.

Whilst speaking of the value of studio work I want to take the opportunity of calling very special attention to one important section of it—I refer to the School of Design. In the August number of *Architectural Association Notes* you may have noticed that I took the opportunity, at the request of the Committee, of inserting a short note upon what, in our new Brown Book, we call the School of Design and Handicraft. Our older members will remember how popular was the old Class of Design in years gone by. I have previously referred to the enthusiasm in connexion with this class under the old voluntary system. Many men, who are now in full blown practice, will remember with feelings of gratitude to the Architectural Association, the great help this old Class of Design was to them in their early days, and I am sure I am only expressing the feelings of many when I say I shall not only remember the class with feelings of gratitude for the good I obtained from it, but with feelings of affection for the many friendships that resulted from our social intercourse and friendly rivalry. Now,

gentlemen, this is the class in our present system that binds us most closely with the past. It is this class that is most closely allied to the voluntary system of teaching. The instructors, or to be more correct, I should say the visitors in this case, give their services freely and ungrudgingly for the good of the cause as of old, yet, withal, I regret to say that we have to deplore a falling off in this School of Design, both in membership and quality of work. It has puzzled the Committee a good deal to try and find out the real cause of this general falling off. It surely cannot be that there is less enthusiasm amongst students for this all important branch of study. I do not believe for a moment that there is now less ability among our students than at any previous period of the history of the Architectural Association. On the contrary, there is every reason to believe that with all the advantages we have been trying to heap up for the future happy student of the Architectural Association that we comparatively old fogies shall in another decade be left far behind, and be looking on with wonder and astonishment at the freaks and fancies of the twentieth century style—what shall we call it?—the conglomerate style, invented by those geniuses we hatched and nourished with so much care in the folds of the Architectural Association. But joking aside—it is my earnest hope that this School of Design may be a great success during the present session, and in expressing my own wish, I am of course only speaking as Chairman on behalf of the committee. Feeling that the fee of 1*l.* is, might be the real stumbling block in the way of many who would otherwise join, the committee have, and I think most wisely, decided to reduce the fee to the nominal sum of 5*s.* in both the Elementary and Advanced Class of Design. I trust that this inducement alone will be enough to make the class more really representative of the work of the students of the Architectural Association. One can only hope that on the principle that [you value most what you pay most for, that students will not value less what they are paying so little for. The very name, and the object of the class, should, of course, itself be an ample inducement for any enthusiastic student to join. If, however, further inducement were needed, surely a glance at the list of names of visitors who, although all busy men, are ready to give their time, energies, and experience freely and voluntarily for the good of the students, should be sufficient. I will not now say more on this subject, except to add that the Committee will watch with hopeful interest the result of its endeavour to meet the convenience and requirements of the students in every possible way.

We now come to the latter part of our title: "School of Handicraft." This question is so mixed up with that of premises that it is hard to speak of them apart. Undoubtedly the want of success in this branch of our work is owing to the want of technical and demonstration workshops in our own building.

This being quite impossible at 56, Great Marlborough-street, the Committee in past years obtained permission for students to attend various workshops and Polytechnics, a list of which was given in the Brown Book. The results are not encouraging, and personally I think the reasons are obvious. Suffice it to say at present, that during the past session not a single student applied to be allowed to attend the Trades Training Schools, or the Battersea and Chelsea Polytechnics. Twelve students however attended the Masonry and Leadwork classes at the Regent-street Polytechnic under the direction of the L.C.C. Technical Education Board. But 12 out of 176 students is, indeed, a small proportion. I suppose that amongst the average students of the present day, there is no need more conspicuously apparent than the want of thoroughly practical knowledge of materials and their proper treatment constructionally and otherwise. Our lectures and instruction on theoretical construction are, of course, very valuable. But practical demonstration in a workshop by an expert, mason, carpenter, bricklayer, and plumber, would be of equal, if not of greater value to the young student, and in any case a very necessary adjunct to theoretical study.

The advice given by the late Mr. Street to a father who wished to send his son to him as a pupil, was: "Please send your son to the workshops of a good builder for a year before sending him to me," and I feel confident that this was sound advice, and I only wish that it could be more generally followed within

certain limits in places where other means of practical training are unattainable.

We all know what severe and prolonged workshop training is considered necessary for a civil or mechanical engineer. In a modified degree, it is not one bit less necessary that an architect should have a similar training as to the quality, uses, and correct treatment of the materials he has to deal with, in various kinds of building. It is simply deplorable, comparatively speaking, how little really thorough practical knowledge of this kind exists, and what is worse, how little it is sought for, amongst the great majority of students. This is not, of course, an evil by any means confined to the present generation only. The haphazard system of learning to be an architect by means of office and class training, and picking up the practical craft side as best you can, has been quite as much an evil of the past as it is of the present day—with this difference, however, that at the present time the facilities for practical craft training are so much greater than they were a few years ago, that there is less excuse for students not profiting by their numerous advantages. I am not, for a moment, urging that an architect should himself become a perfect craftsman in all trades. With the many qualifications that are considered requisite for an architect, life is far too short for such an ideal; but I do assert that an architect, worthy of the name, should have such a personal practical knowledge of materials and actual workmanship that he can always utilise the former to the best advantage, and correct the latter when defective, in all trades; to do this he must gain his experience on the actual building or by practical demonstration in the workshop. It is for this reason that I sincerely hope we shall before long see proper demonstration workshops in direct connection with, if not under the same roof as, the present or future Architectural Association premises. Until such arrangements can be made, I do hope that a larger proportion of the students will join such Polytechnic or other technical classes as they may find most convenient, and that all will take every possible opportunity of visiting various works in progress wherever possible.

Principals can in a great measure help forward their pupils in this way, by allowing them continually to visit works they may have in hand, whereby the pupil can study the plans and details and building together. And further, I feel sure that there are many architects who have sufficient interest in the education of their younger brethren to give to individual Architectural Association students permission to visit their buildings. Personally, by previous arrangement, I should be always pleased to do so.

There are two other points bearing upon the work of the last session that I feel bound to touch upon. First, that the instructors do not think the "home work" is as good as it should be, and the second is the want of support given to the Modelling Class. As regards the former, the Association cannot, of course, attempt to regulate the "homework" of students, but let me say that if they want to obtain the full benefit of the lectures and classes they pay for, homework is an invaluable accessory, and one which by being neglected leaves the individual student the main sufferer. And with reference to the latter, what I have said as regards workshop study applies with equal force to the study of modelling. Wholly independent of the intrinsic value of modelling as a means of learning form and proportion, and the value of light and shade under various conditions, and in various positions, it is one of the greatest helps to an architect being able to illustrate his requirements as to ornament or intricate stone work, by modelling for the carver or mason—and it is a kind of illustration that both carver and mason appreciate far more than a pencil sketch, and greatly enhances the reputation and respect for an architect among the workmen. Somehow the great value of modelling is not properly appreciated.

In Mr. Pomeroy we have an instructor second to none in the art, and this, combined with the simple facts that I have stated as regards the value of modelling to the architect, should tend to render this one of the most popular classes in the Architectural Association. I am afraid so far you have found what I have said very severely practical, but I cannot but feel that if we wish to make the Association work more thoroughly successful than it is, it is well that we should at times look at the



severely practical side of things, and see where our defects and weaknesses are, that we may be in a better position to remedy them.

To turn now to more general subjects. Undoubtedly the greatest need of the Association at present is the want of new premises.

For years past this need has been unceasingly felt. The prospect of new and more suitable premises has so often been foreshadowed, unhappily without any tangible result, that I cannot wonder that members should feel disappointed, and, consequently, somewhat apathetic on the subject. But I can assure those who are not immediately behind the scenes that the question is by no means an easy one, and beset with many difficulties. The Committee, as a body, certainly have not shirked the question. Time after time have different schemes been brought before them, and many hours have been spent in the inspection of possible buildings, and yet on only two occasions have we come anywhere near a solution of our problem, and then only to find our hopes blighted by some unforeseen difficulties. The largeness of our requirements and the limited means at our disposal form the two great obstacles to the attainment of our long-deferred hope.

In company with several of my predecessors in the chair, I had good reasons to hope that I should be able to bring before you this evening a scheme that would meet our requirements, and it is with much regret that I find myself at the last moment unable to do so. But I can say this much, that the Jubilee Premises Committee have under consideration another scheme that we sincerely trust we shall be able to submit for your consideration at no distant date. As certain questions have lately been put to me on the subject, I will briefly state what I consider our needs are, and what I shall aim at obtaining in any scheme for new premises.

In the first place, I should like to see our Architectural Association centre made much more of a true centre—a home, or club, if you like it better, of architectural life; a place where one and all members could drop in at all reasonable hours of the day and enjoy the privileges of a good common room, where light refreshments could be obtained, and a comfortable reading and writing and smoking room; a place where one would not feel ashamed to ask a friend or client to meet one, and where the parents and guardians of any student might call without feeling that they were visiting a sort of architectural wholesale warehouse or counting-house; and last, but not least, a place where country members or members of allied societies could call and feel that they had a homely centre in this great metropolis where they would be always welcome and could meet men of like interests to their own.

I have no wish to draw any fantastic picture, but in my humble opinion a modified club life, such as I have referred to, would be of great service to the younger as well as the older members of the profession. Within proper limits its tendency would undoubtedly be for good all round; it would form a social background to the otherwise serious educational work of the Association, which would reflect warmth of feeling and create a spirit of *esprit de corps* amongst its members. I could wish that there was some such club life in the Royal Institute of British Architects, that it might be in reality what it should be, the proper social, as well as the professional, centre in London for all architects.

In addition to good offices and library and class-room accommodation, it is, I think, desirable that we should have our own meeting room if possible, and a large, well-lighted and ventilated studio will be an essential feature; and the next important new requirement should be demonstration workshops, an addition which will, I hope, be one of the great features of our future educational work. You will notice that I use the title demonstration workshops; I do so advisedly. Any scheme for extensive workshops in various trades would (even if it were desirable) be entirely beyond our means. Men who wish to attend regular workshops where they can see a large variety of work can always make arrangements with some good builder to do so, and they will no doubt obtain a good insight into practical work. There are, however, many obvious difficulties and I think some objections to regular builders' workshops training. To begin with, any one who wishes this sort of training to be of real service to him must make up his mind that no half measures

will be successful. He must drop any sort of kid-glove studentship, and be ready to work with his hands, and on the same footing as any ordinary mechanic. There are troublesome class difficulties and craft jealousies to be faced—a footing to be paid for; added to which there are only too often influences of a low moral and degrading kind that cannot be healthful to the younger student just starting upon his life's career; and in saying this, I speak from personal experience.

Again, hard manual work at the bench or banker may often be injurious to a man's sketching and pencil work.

It is for these reasons that I think the first practical training for architectural students should be in technical schools and demonstration workshops rather than at the actual bench or banker at a builder's works. If after such training a student can take the position of a clerk of works, or a place under a good clerk of works, I believe he will have precisely the kind of practical training that an architect requires.

The demonstration workshops that I should like to see in connexion with the Architectural Association ought to consist of at least three large rooms: one for carpentry, a second for mason and bricklayers' and tilers' work, and a third for plumbing and general metal work. The furniture would, of course, consist of benches, bankers, lathes, and other necessary tools and appliances on a modified scale; but, further, it should be furnished with models of wood, stone, and metal construction, and plumbers' work. In some cases, such as roofs, floors, staircases, and gironing, the models would necessarily be on a small scale, but in all cases they should show accurately the construction, with joints, tenons, mortices, scarfings, &c., complete. But for such details as doors, window sashes, and casements, and other things of every-day use that will readily suggest themselves, full-size models would be more useful, and so made that they could be taken to pieces and put together again, so as to be copied, bit by bit, to small scale by students. It may be objected that the cost of such models would be very considerable—which, if they had all to be especially made, would certainly be the case. But I would suggest the following method for the commencement of work in this new department:—

1. That the initial expense to the Association would be the necessary fittings, tools, and materials. When these were once obtained, the fees for the workshop course should be more than sufficient to pay the remaining expenses.

2. That the services of experts in each of the various trades should be obtained at a reasonable fee, and that the duties of such experts should consist of descriptive and practical lessons in setting out work on the board from scale drawings, and as to the best application of that setting out, to the actual materials, so as to obtain the best results and avoid unnecessary waste—to give actual working demonstration on the bench or otherwise, in preparing, and afterwards putting together the model to be constructed.

3. To superintend the students' work in carrying out various portions of the same model or other work he may set them to do.

4. That certain members should be invited to become visitors, and that they should from time to time set a subject for a model, or a problem, and give designs and details, say  $\frac{1}{4}$  in. and  $\frac{1}{8}$  in. scale, to be worked out in proper materials by students to  $\frac{1}{16}$  in. scale, or larger as the subject might allow. By this means it will be at once seen that in a few years the Architectural Association would have a most valuable set of models always ready for reference, made by the students themselves, under the supervision of an expert, and without any other than the ordinary running expenses being entailed. When our collection of models was large enough, no doubt the students who made future models would be glad to keep their own handiwork in memory of the happy hours spent in the demonstration workshops of the Architectural Association. I may here remark that the manual labour involved in working out these models and details to scale is a very different matter to working on large planks and heavy stones in a builder's yard, yet, for all practical purposes, the teaching would be the same, and that without injury to the hands for drawing purposes.

Please forgive me if I seem to have dwelt on

this subject at some length, but I feel so strongly that this addition to our curriculum would be such a popular and useful feature in our future work that I could not refrain from expressing my views plainly.

There is one other class that I should like to see revived in connexion with the Studio, and that is drawing from the antique and from the life. I say revived, because as far back as 1864 a class was started for this end, but from lack of the method such as we now have it fell through. I cannot but think that such a class would be found very useful to many of our members of all ages.

I sincerely trust that my picture of what we hope for in our new premises is not merely a fancy one or fated never to take substantial form, but that ere long we shall see it an accomplished fact, and that our long and patient waiting will only make us value the more our new home, wherever it may be.

Gentlemen, at the commencement of this paper I addressed you as fellow students in architecture. Believe me, I meant this to be no mere form of words. I take it as a simple axiom that we are one and all students in our beloved art, and this is an axiom that cannot be too often repeated, for I fear that after passing through the first stages of studentship and commencing practice many are far too apt to agree with the sentiment of such an axiom without carrying forward their studies, and thus building up upon the foundation of their earlier architectural education. It may be safely asserted that no profession or art needs more keeping up and continuous study than architecture, and it is equally certain that an architect who ceases to study, not only by book-work, but by travelling and sketching, becomes sooner or later a more or less repeating machine. His ideas crystallise, and his designs become cold and lifeless. It is for this reason that I hope one and all of our members will claim the honourable name of student in architecture. We are only on different stages of the ladder. To those who are just commencing their climb let me say, look well before you start. Consider well what are your qualifications. Can you honestly say that you love art for art's sake, that you are prepared to work hard and in a great measure to sacrifice your pleasure for your art, that you do not take up architecture merely because it is a respectable profession? If so then I think you may go forward with every confidence of future success; but if not, for the sake of your future happiness and welfare, you had far better turn back before it is too late. If you seek an easy-going and lucrative profession only, do not become an architect. The practice of architecture is neither easy nor lucrative: on the contrary, it is one of the hardest working and most poorly paid of professions, as a large number of its members have, I am afraid, learnt from sad experience.

On the other hand, the man who sincerely enters into the true art side of architecture will experience great pleasure in his work, a pleasure that it would be hard to surpass, if indeed to equal, in any other profession or calling, and although wealth will be within the grasp of comparatively few architects, yet with a true love for his art as his main guide, with industry, ordinary business capacity, and last, but not least, absolute integrity in all business transactions, he will almost invariably be sufficiently successful to render his professional career a happy one.

In speaking of architecture as a poorly-paid profession, I am reminded of a somewhat amusing episode. A client of mine wrote a certain sanitary surveyor and auctioneer, &c., who she had previously employed on some sanitary work, complaining that his charges, which I may say amounted to over 15 per cent. on a total expenditure of some 1,000*l.*, were greatly in excess of the charges of architects whom she had employed before on other house work. The answer of the sanitary surveyor and auctioneer, &c., was to the effect that, of course his charges were quite a different matter to those of an ordinary architect. He was a specialist! This, at least, indicates that there are some people who think that architects must be poor sort of things to charge so little; and, in passing, I cannot help remarking that our system of charges does seem somewhat an anomaly. The Scott, Street, or Pearson of his age, charging precisely on the same scale as Mr. Tom Brag, architect, auctioneer, and house agent. It is somewhat like a Millais or Leighton charging at the same rate per square foot of canvas as



Mr. Daub, who once succeeded in getting one of his pictures marked with a big D, and hung in the Academy. The result is too often that the men who have made a name get more than they can possibly attend to properly, whilst the less-known men get little or nothing to do. I feel that, from an art point of view, it is an utterly wrong system, but as the public, our patrons, would not be satisfied unless there was an equal schedule of charges, I acknowledge the difficulty of finding a remedy.

Having, in the early part of my address, referred to some of our smaller weaknesses in working, I think I may now fairly congratulate the Architectural Association on its otherwise prosperous position. Our roll of membership is the highest on record, and you will be glad to hear that our members have reached a total of more than 1,220. This in itself is sufficient to show how widespread is the interest that is taken in our work, and how popular our Association has become in every branch of the profession. Added to this, I am glad to say that in spite of necessary extra expenditure, our financial position is still sound; and again, that our position from an educational point of view is equally sound, in that our many able instructors are content to remain with us, and to thus place us in a position of being able to offer students advantages in architectural education far superior to that offered by any other institution of the kind.

But these are not the only signs of encouragement or success. The rejoining of several old members who had allowed their membership to lapse, and the joining of some new members whose names are well known in the profession has been quite a feature in the commencement of this session. Amongst the former I must mention our old friend Mr. Arthur Cates, who has been reinstated as a member at his own request, and has paid up his subscription for no less than thirty-four years, placing him now in the honoured position of the oldest living member of the Architectural Association, and amongst the latter are Mr. H. T. Hare and Mr. Edwin T. Hall. We extend to these gentlemen, and to all members who have joined our ranks, in like manner, the hand of good fellowship and warm welcome, and we hope that they will not be content with adding their names to our list of members, but will help us from time to time as occasion may require with their counsel and advice, or in such of the voluntary work that still happily remains a part of our system. It is here that I would venture to make an especial appeal to the profession at large to join our ranks, as by so doing they will not only help us morally by their sympathy, but by their annual subscriptions will help the educational work of the Architectural Association financially.

We year by year gratefully acknowledge the valuable help and support given us by the Institute, without which we should find it difficult to keep up the standard of our work. Whilst I cannot but consider that the Institute, as the leading architectural society in the land, only do what is their bounden duty in helping forward the educational work of the Association, yet the help they give us is the more valued because it is given freely, and without being trammelled with conditions, showing that the Council have faith in both our system and our officers.

The generous financial help given by several leading architects, when the Association most needed it, at the commencement of our present scheme of education, will always be remembered with gratitude. We cannot, however, expect this kind of help except on very special occasions, or for very exceptional purposes. Surely it is not too much to expect from other architects, who have been fortunate and successful in the practice of their art, and who have not previously helped our cause, that they should come forward and help, to the best of their ability, the great work of education being carried out by the Architectural Association.

Is this work to be left to a few hard-working architects, whose enthusiasm and love for the future welfare of their art urges them to give their time and talents ungrudgingly for the cause? Can we allow it to be said that we, as a profession, are so selfish, so warped in our ideas, so wrapped up in our own small centres of art and petty personal interests that we forget, or will not take the trouble to remember, that there is a great cause to be worked for as well as that which more closely concerns ourselves? Surely not! If the helping of our younger brethren in their

early architectural training tends to the good of that great cause and the advancement of our art, as I maintain it does, then, surely, it is the duty of all to do what they can for that end.

Some twenty-five years ago, when I was in the Western States of America, on the shores of Lake Superior, an American friend met an old priest, who was a most eloquent preacher, and asked him why it was he was content to stay in the, then, Wild West, on a poor income of \$500 a year, when, with his powers, he could get \$5,000 in New York. His answer I have always remembered. He said: "What you say may be true—what is \$5,000 to me, compared with my duty to the great cause? I was sent to take charge of this district. I am doing my little best to fulfil my duties. When my work is done my little best will go to strengthen the great whole, and so the work of the great church advances."

I only give this as an illustration of a noble example of self-abnegation for the benefit of the whole body, and as it is applicable to any act of unselfishness for the good of others. Although the great cause referred to in this simple anecdote, is, of course, incomparably greater than ours, yet the same principle applies. In common with that of the artist, our art of architecture, which is itself noble and refining, calls into existence one touch of the Divine Faculty—creative genius. We have, in that art, a great cause to work for, and the more we can make our individual work tell for the good of the cause as a great whole, and the more we can help others forward in working for that end, the better it will be for ourselves and for the advancement of our art.

Amongst the other encouragements in our work it is satisfactory to notice the growing interest and increased attendance at our fortnightly meetings and the success of the Discussion Section.

It is often a cause of wonder to me how it is that the papers at these meetings keep up to such a high standard as they do. As a set of educational papers they are most valuable, and judging from the titles and well-known names of the readers of papers for the present Session we may hope for excellent results. I do hope that members will prove their appreciation by a large attendance, and further that the younger members will try and join in the discussion after the papers. An excellent syllabus of papers has also been arranged by the energetic members of the Discussion Section. The papers of this section are often exceedingly good, as may be judged from some of those we have published in the "Architectural Association Notes." I should strongly advise students to join, as the meetings are so arranged as not to clash with other class work, and it is here that they will be able to gain confidence in asking questions and speaking in public.

There is another side of the Architectural Association work which is most useful, and is now as successful as it has ever been, I refer to the social side. Now there are some to whom this side of our system is somewhat a stumbling block. They think, and I have heard some say, that it seems a pity we should spend money on such frivolities as our Annual Soirée and members' smoking soirée. I must entirely disagree with those who would cavil with us on this point. Their objections arise either from an entire misconception of the objects of our social gatherings, or else from want of experience in the work of such a society as the Architectural Association. I can, of course, conceive that it would be easy to let the social side become a too prominent feature in our system, which would be distinctly injurious to its main objects. But under our present elective system, in which a very large body of men of tried experience have a voice, I believe there is no danger of such an evil happening.

The social side of the Architectural Association is, and I trust always will be, one of its great features, contrasting as it does favourably with that cold red-tape system that would dub every kind of relaxation as undignified, and every penny that was spent on it as wasted. To speak more strongly, I would say that the social side of our work is one of our sheet-anchors. Take away that social side and you will have a model in still life, perfect perhaps in its form, but lifeless and without soul. Indeed, so strongly do I feel the great use of the social side of our work that my great wish, as I have before stated, is to see a modified form of club life established in connexion with our new premises.

It is this social side that is one of the main wants of the Institute. It would give it a kind of life and soul that it does not now possess; it would make it more attractive to young and old. This to my mind is an exact case in point—few can find fault with the thorough and business-like way in which the great and excellent work of the Institute is carried out, but no one will suggest that its social qualities as a body, almost exclusively confined as they are to a guinea and half annual dinner, are such as to inspire fraternal feelings in the bosom of the most warm-hearted artist.

But in the Architectural Association one of our greatest aims is to encourage that social intercourse which is so valuable, and that strong feeling of fraternity that should exist amongst all true artists. In a limited way our annual excursion helps to create, extend, and foster that warm feeling of brotherly equality in art.

One episode in the last excursion was the admiration called forth by Nesfield's work at Hampton-in-Arden, Warwickshire—and especially his careful restoration of the village church. Here I felt, and I think we all felt, a touch of brotherly kinship for the artist, of whom it may truly be said "though dead, he still speaketh."

May the works that we carry out speak in the same language to future generations, and here I cannot help referring to the loss we in common with the whole art world have sustained by the death of Sir Edward Burne-Jones. If there was any one artist more than another who entered soul and spirit into the greatness of his art, where highest aims were purity and poetical ideals, whose work has influenced the whole world of art, and the result of whose influence and example will live on for generations to come, that artist was Burne-Jones. Such a life, and such art as his, must mark him out as the artist amongst artists of the nineteenth century.

In speaking of painters generally, one could wish that they, as a body, could enter more into the art side of architecture than they do. Of course there are many exceptions, but as a body, I do not think it can be said that they really appreciate architecture, and certainly very few take any trouble to learn the guiding principles of our art. The more they do so, the more will architects be able to enter into their feelings, with results that cannot help being mutually beneficial in case of decorative work. Undoubtedly we, as architects, have many bad art traditions to unlearn, and much more that is good to learn. We are much too apt to accept the shoddy decorator's bad copies of ill-drawn medieval work, and seek to obtain quantity instead of quality. It is only the drawing together of architects, artists, and sculptors in mutual intercourse, and the exchange of ideas, that will help to break down the ignorance that exists on both sides, and bring about the harmonious results to be desired.

This mutual understanding is equally if not even more necessary between the architect and the stained glass artist. On the one side, how many buildings have been ruined by the stained glass put into the windows, owing to the entire want of sympathy on the part of the artist, with architectural surroundings; and, on the other hand, it not unfrequently happens that the artist is trammelled by the requirements of an architect who knows little or nothing of the correct treatment of glass, and seeks rather to obtain a series of copies of pictures in glass than a glass picture.

The employers are, of course, often to blame for these incongruous results. Their estimate of the duties and capabilities of architects is often, and not without cause, a very limited one. That the architect's artistic powers should extend beyond the limits of bricks and mortar, drains, and ventilation, does not occur to many; on the other hand, their view of an artist's power, simply from the fact that he is called an artist, is sometimes extensive, and they would deliver the work of decoration of a building or the stained windows into their hands without for a moment thinking whether such artist has any sympathy with architecture, and without realising that the whole architectural proportions and effect may be simply ruined by the misapplication of colour decoration and ill-chosen glass. An amusing instance of how extensive the powers of an artist are considered to be occurred to my brother, who, when considering the scheme for the mural decoration in one of my churches, was asked mysteriously by the churchwarden



if he could consult him on a small matter of business. "The truth is," he said, "I have a friend who has a false nose, and she wants it painted to suit her complexion. Will you kindly undertake the job?"

But whatever our powers, be they limited or extensive, do let us, as a body, try our best to get in touch with artists and craftsmen of all kinds, and then I feel sure that those whose work is worth having will gladly meet us half way, to our mutual benefit.

In drawing to the close of an address of this kind one feels how much there is that might be said with advantage on many points that there is no time even to touch upon, and how many things one ought to have said that have been omitted. But please forgive such omissions, and although what I have said may at times have seemed, as before hinted, somewhat severely practical, I trust you will believe that the sentiments therein expressed are sincere.

Gentlemen, let my last words be to remind you that as architects our responsibilities are as great as our work is noble, and the growing appreciation of what is beautiful, and what is highest and truest in our art, within our ranks, if we are true to ourselves, cannot but make its influence felt in the outside world. Great as has been the advance in our art during the last sixty years, yet architecture as an art is at the end of the nineteenth century only beginning to be recognised as such by people at large. Officially, the best representatives of our art, the men who are entrusted with the building up of the nation's monuments of peace and posterity, remain unrecognised and unwarded. A great, free, and enlightened daily Press as yet treats architecture with comparative indifference, and from simple want of appreciation of the work involved in the design for any great building, in many cases consigns the name of an architect to oblivion. For some of this indifference, and want of public acknowledgment, we, as a profession, have in a measure ourselves to blame. When people have forced upon them such buildings as have lately been allowed to disfigure such sites as the Embankment (near Somerset House) and Victoria-street, Westminster; and when buildings that have been erected at great cost have, from time to time, to be condemned, as unsafe through structural defects, it is no wonder that they cry out—Where is the art and science in architecture?

It is the object of improving matters that forms the very *raison d'être* of our Association. But we must also remember that however much we may value the appreciation of others, our art, as such, is in no way dependent upon public appreciation, which as all know is a fickle quantity. The highest art is the true reflex of the inner man. Let your work be truly your own work in every sense of the word, stamped indelibly with your own individuality. It is by such work you will make your "little best" strengthen the great whole, and advance our art. We architects are the writers of a nation's history in stone, brick, mortar, and metal. It is our work that will speak of the nobility and greatness, or weakness and depravity, the richness or poverty of a nation. Think of the history that is recorded to us by the great architectural works of Egypt, India, Athens, or Rome—think again, how accurately the work of the early and mediæval times describes the character of men then living. Surely an art such as this is worth living and working for.

To us in a great measure is entrusted the comfort and health of the community, to us the raising of great municipal and national monuments, and last, but not least, to us is given the honour of designing temples for the worship of the Great Architect of the Universe, buildings that will each, in their own way, in the future, influence men's minds for good or for ill, as the buildings of our forefathers have influenced our own.

For students, let my last words be those of Bacon: "Our studies serve for delight, for ornament, and for ability."

Mr. H. H. Statham said he wished to propose a hearty vote of thanks to the President for what had been one of the best written and most comprehensive addresses ever delivered in that room. The President had shown all that the Association should strive to do and might do, and had put before them some of the difficulties which beset them, one of which was the insufficient attendance at the higher classes of the curriculum. The President had men-

tioned that some subjects had been transferred from the second to the first division, in order to get them into the division which was best attended by students. He (the speaker) thought that the proper object of the first division should be to give elementary instruction in the sciences which bore upon architecture, and in the second division the instruction should deal with special problems of construction. Therefore, the present arrangement was an improvement. The general history lectures ought always to have been in the first division. Surveying, which had now been made an extra subject, ought never to have been in the first division; it was rightly placed as an extra subject, for it was not a necessary part of architectural practice.

Nevertheless, he would urge young men not to despise it, for the capability of making a good survey was of great advantage sometimes, and it was also healthy and enjoyable work. He spoke from experience, for in his pupilage and "assistant" days he had done a good deal of surveying work. As to the reasons why the curriculum of the Association was not taken advantage of as much as it should be, was it not partly because of the difficulty of continuing the latter part of the course along with office work? The President had referred to the importance of demonstration classes and workshops, and had spoken of the disadvantages of apprenticeship of young architects in a builder's yard. He thought the President was quite right. For a man who was to become an architect and use his pencil to a certain extent, apprenticeship in a builder's yard was too rough. The architect was not like the engineer, who was called upon to design severely practical work, and for whom such training would be suitable. If, in the brilliant future which the President had painted, they had a sufficient number of practical classes in their new premises, would it not be possible to arrange for students to attend those classes for, say, two years, with the idea that at the end of that period they should enter offices and give their attention to learning the practical work of an architect's business? The classes would be more thoroughly made use of by students, who would not attempt to do more than their time or strength would permit. He agreed *in toto* with the President in regarding the Examination of the Institute as not being an end in itself. The Examination had been of great use in encouraging young men to give their minds to obtain a sound practical and scientific knowledge of their profession. That, he thought, was the real and only proper object of it. They could not teach or examine in art in that sense, but they could teach and train and examine in scientific knowledge. The Studio was another and most important branch of the work of the Association. It was a place where, as the President said, a student would learn to express his thoughts with his pencil. He (the speaker) was glad to hear the President say that, for there were those who would say that the Studio was a place where a student should learn to work with his hands. Architecture was an intellectual conception and a man could not make a satisfactory intellectual conception of a whole building if he had to split up his thought on the carving, or moulding, or on every little part, and make himself a practical mason or carver. What an architect had to do was to make an artistic conception, though, of course, he must understand the nature of materials and the conditions of work. The really true and the born architect was the man who was able to grasp a special problem put before him and see how it could best be dealt with. It was important to bring that before people both inside and outside the profession, because people often went to a particular architect because he had erected buildings of a certain class, without taking the trouble to find out whether he had done them well or not. They forgot that every architect who specially designed farmhouses, workshops, hospitals, or libraries, for instance, once did so for the first time. Young architects, when called upon for buildings requiring special knowledge, instead of being afraid of the work should completely give their minds to it—look up all that had been done or written on the subject, and then consider whether they had any improvement to add. A man who earnestly set himself to learn what had been done by others, would learn more in a fortnight than the man who pursued his studies in a desultory way would learn in six months. As to the social side of the work of the Association, he agreed with the President as to its value, but he wanted to ask whether the music-hall

element was necessary at the smoking concerts. He went to the last smoking concert, which, in some respects, was a little vulgar, and he thought "Is it not possible for a company of artists to amuse themselves artistically, in a refined way?" Another point to which the President had referred, the manner in which architects were treated in this country, was a painful subject. He would mention a little fact which showed the contrast in this respect between this country and France. He was recently looking at a photograph of the grand staircase of the Paris Opera House, taken at the time of its opening by the late Emperor. The photograph was taken as the Emperor and his suite were ascending the stairs, and on the first landing the central figure was that of M. Garnier, the architect, placed there to welcome his Sovereign into the building which he had designed. In England, on such an occasion, the architect would be left to find a back seat where he could, and the reporters would probably not even give his name.

Mr. Beresford Pile, in seconding the vote of thanks, said he must congratulate the Association upon the manifest fitness of the President for the task of conducting the educational work during the coming year. The influence of association amongst them upon their educational work must never be overlooked, and their President's address, as well as other functions, told for association. The Association had learnt by experience how the architectural student of the day desired to be trained. Inasmuch as the Association originally designed a four years' course, and found it was not altogether popular, and had to fall back on a three years' course, and finally on a two years' course, they would soon arrive at what was after all the most satisfactory method of architectural education, because no method, however scientific in its arrangements, would be satisfactory—at all events with the Association—until students were attracted to it. He thought they might rest satisfied that the Committee, who were elected annually, could not afford to adopt any scheme of education which would not be popular or satisfactory to the members whom they sought to educate. The members should not forget that they thus had a responsibility in taking part in forming a scheme for their own education—which was of more importance than some would allow. The growth of the arts and crafts movement had not only influenced the third and fourth years' courses of their work, but it had to some extent impoverished the second year; but the Committee were alive to it. The scheme of education was formulated for the purpose of meeting the new conditions created by the Institute examination. That examination was being modified, and the scheme of the Association must be modified with it. He hoped sincerely that the examination scheme would be modified yet further, and that they would yet get away from the stiff-covered history books, and learn to look at architecture for themselves. But with regard to the Association schemes, they must give some credit to certain older members of the committee for what had been done to meet present-day needs. An architect could not design in a material the nature of which he is unacquainted with; but if it were necessary for a man, in order to design, say, fine iron work, to hammer it out with his own hands, that man must be content to die and be re-incarnated two centuries ago, where he would be brought up at the feet of that magnificent generation of born smiths who created the ironwork of the Early and Later Renaissance. We did not live in that age; he wished we did; William Morris wished so, and some of his followers wished to put us back to it. When and if that age did return we should be able to do our share in its work; but at the present time we must do the work of the present age. He was strongly of opinion that the best they could do was to throw all their energy into the work of the Association.

Mr. Edwin T. Hall, in supporting the vote of thanks, said he was one of the newest members of the Association, but he had always had very great sympathy with its work, and had watched its growth and progress with pleasure. When the scheme of education was first started, he was for two years one of the lecturers. He had about seventeen in his class, though the subject, viz., architectural practice, was not the most interesting, though it was one of the most necessary branches of an architect's education. He was sorry to hear that it had been found that a four years' course was too long; no doubt the want of success of



the later divisions was owing to the fact that students who were working in offices had not time enough to devote to the classes. As to the question of putting the subject of architectural history in an early division, in his opinion there was a danger in doing so. A young student whose mind was a blank on the subject might be too strongly influenced by the history of Greek or Medieval, or older work, and when he began to design for himself he would feel that he must design in those styles. The young student should be taught to study the subject of architecture from the artistic and intellectual points of view, and when he had acquired some knowledge of design, some knowledge of how to appreciate work, then he should study the monuments of past time. He agreed as to the drawback in the way of a student working in a workshop. A young student's hand would soon become unfitted for pencil work if he used a mason's hammer or other tools. He very much doubted whether many of the great artists of the past went through such a course of study at all. Besides, to do all that was expected of him, a student needed two or three lives. He thoroughly agreed as to the value of the social side of the work of the Association. An eminent scientist at the recent Sanitary Congress at Birmingham said that one of the best things for health was the frivolous conversation that took place at the dinner table. He agreed, however, with the remarks of Mr. Statham as to the mistake of introducing a music-hall element into the smoking concerts. They could get plenty of good music and entertainment without finding it necessary to bring them from the music-halls. With reference to the general question of architecture, they must all be delighted to see the immense progress that had taken place in design. No one would think now of building for the chief post-office such a building as was to be found at St. Martin's-le-Grand. He thought that Mr. Statham was right in saying that a trained architect was as capable of designing a good building the first time he tried as he was the sixtieth—probably better, for he would be likely to give his whole thought to his first work.

Mr. Cole A. Adams said they had listened that evening to a most excellent address, which had been delivered in an excellent manner. He had seldom listened to an address with more pleasure.

Mr. Walter Millard said that the President's remark, as to the value of experience gained on the actual building, reminded him of an old story concerning a certain young architect who once faced an angry builder high up on the scaffold of a church tower he was building. The builder so far forgot himself as to seriously threaten to pitch the architect off; whereupon the latter, looking the man straight in the face, replied: "All right—but we go together!" That architect's name was Fellowes-Prynn; and the anecdote would serve to show what sort of a man their President was.

Mr. Seth-Smith said he supported all that had been said as to the objects of the examination of the Institute, but there were one or two words in the address which were capable of an interpretation different, perhaps, from what the President intended. If the examinations were not a test, to some extent, of art, the sooner they did away with them the better. The degree could not be tested, but surely they could test a man's power of draughtsmanship and design sufficiently to ensure his not being a disgrace to his calling. If not, the Institute would be filled with men who were mere builders.

Mr. Statham then put the vote of thanks, which was carried unanimously.

The President, in response, said that during his term of office he should endeavour to do his "little best" for the benefit of their great art. He cordially agreed with what had been said by Mr. Statham and others about the social side of their work. Nothing could be farther from his mind, or the mind of any one who had the interest of the Association at heart, than that the social meetings should become vulgar or low. If the members themselves would help in this work, and there was plenty of acting and musical genius amongst them, there would be no need to get assistance from the music-halls, and their entertainments would be as amusing and comical as ever.

The President then announced that the next ordinary meeting will be held on the 28th inst., when a paper by Mr. J. E. Newberry will be read on "Excavations at Thebes."

The meeting then terminated.

#### MAGAZINES AND REVIEWS.

The *Gazette des Beaux-Arts* includes an article on Gaetan Merchi, under the title "Un Sculpteur Oublié," and the conclusion of M. Cagnat's article on the remains at Timagad. "La Resurrection d'une Ville Antique," with views of the theatre and forum, &c. M. de Vasselot's article on "Le Trésor de l'Abbaye de Quédlinburg" introduces us, among other things, to a splendid Medieval book cover and a carved wooden coffer with silver-gilt decorations. Lady Dilke contributes an article on the exhibition of French pictures at the Guildhall. We should have preferred a French opinion on it.

The illustrations in the last number of *The Architectural Review* (Boston) show curiously how the Americans, after a kind of brief spasm of originality, are returning to old models. The County Court House, Worcester (Mass.) is a pure Greek building by Messrs. Andrews, Jacques, & Rantoul; the Roxbury High School, by the same architects, is like "Domestic Gothic;" the Randall Dining Hall, Harvard, by Messrs. Wheelwright & Haven, is a piece of Roman Classic in brickwork. The first-named building, the Worcester Court-house, is a very elegant "composition" (the expression exactly suits it), and the management of the external steps and approaches is good. The number contains an article (not concluded) on "The Architectural Work of Charles Garnier." The author, while recognising fully the remarkable merits of the Paris Opera House as a whole, is we think quite right in his estimate of it in detail: "the decoration of the Opera House expresses his own taste as completely as if he had with his own hands executed every portion of it; but that taste is hopelessly bad." It was, in fact, the taste of the Second Empire, and the building in this respect represents its day.

The *Deutsche Kunst und Dekoration*, with an exceedingly ugly specially designed cover, appears to be another magazine intended to illustrate the modern German taste in decoration. The illustrations show a great deal of work which is clever but not refined—indeed in some cases ugly. A carpet design, by E. V. Berlepsch, is the best thing we notice. There are one or two good sketches of domestic stained glass, and some exceedingly bad ones. The magazine contains a great number of illustrations, however, of all kinds of decorative design, and we presume there is plenty of room for such a publication in Germany.

The *Art Journal* includes an article on wrought-iron work in and about Salisbury, the sketches to which show some old work of considerable interest. A "new pattern in linen," given under the head of "The Arts and Industries of To-day," is a very pretty one. "From Philæ to Korosko" is an article by Mr. George Montbard, who handles pen and pencil with equal effect and success.

The *Studio* (September 15) is devoting a considerable space to illustrations of the designs made by students in the National Competition, South Kensington; these show that a good deal of original, clever, and sometimes very pretty work has been done, more perhaps than has been generally recognised. A notice and illustrations are given of the Mortuary Chapel designed, it is said, by Mrs. F. G. Watts, near Guildford. No plan is given; from the photographic illustrations we may gather that the interest of the work lies in its detail rather than in the architectural design.

Among the contents of the *Magazine of Art* is an illustrated article on "Oriental Puzzle Locks," a curious and interesting subject, and one on the portraits made by George Dance, the younger of the two architects of the name, who appears to have made a number of portrait heads of his contemporaries, in pencil lightly tinted; a style of work in fashion in his day. Some of these are illustrated. An article on the works of Puvis de Chavannes and Detaille (rather a curiously assorted couple to treat in one article), in reality a review of a French work by M. Vachon, is worth reading.

The *Artist* has an article, with line sketches, on "The Art of Illumination" by Mr. H. A. Heaton, and some others of interest; but the one we specially welcome is the conversation of three people—a French artist, an "ordinary man," and a London County Councillor, on the wretched business on Waterloo Bridge to which we have already referred—the removal of the dignified old lamp-standards, the style of which exactly suited the bridge, and

was made to suit it, and their replacement by the wretched common-place things which have now been put up. The French artist is of course on the side of the old lamp-standards, and chafes at the County Councillor's unmercifulness on the subject. This "Talk by Three" is a lively bit of criticism, and should be read. In the notice of Robert de la Sizeranne's book on "English Contemporary Art" the reviewer makes the same absurd mistake which we have already noticed in the *Quarterly Review*, of saying that Sizeranne commenced with the statement that "there is an English School of Painting." He did nothing of the kind; he said nearly the reverse: he said "Il y a une Peinture Anglaise," and then went on to say that there was nothing that could be called an English "School," only English painting was different from everything else. As the review is based on a translation, the mistake may be that of the translator.

The *Engineering Magazine* contains articles on "The Recent Lighthouses of France," and "The Great Railway Stations of England," both of which will be of interest to our readers.

In the *Antiquary* the "Ramblings of an Antiquary" are directed this month to Trinity Church and the Guild Chapel at Stratford-on-Avon, and the wall paintings to be found there, of which some sketches are given. There is a historical article on tapestry, under the heading "England's Oldest Handicrafts," by Isabel Stuart Robson (we know not whether "Miss or Mrs.").

The *Century* contains an article on "Edouard Detaille, Painter of Soldiers," with facsimiles of some unpublished sketches by Detaille (not of the highest interest, however); and one on Gilbert Stuart's portraits of women, with an illustration; Gilbert Stuart was an American artist of the commencement of the century. An article by Mr. Frothingham on "The Roman Emperor and his Arch of Triumph" is concerned with the sculptures on the Arch of Trajan at Benevento, and the casts from it taken by the students of the American School at Rome, of which several illustrations are given. We quite agree with the author that the American School has done a good piece of work, and justified its existence. Then there is an article of considerable interest by Mr. G. H. Darwin on "Bores"—not the human kind, but the tidal rashes which occurs at the mouths of some rivers, and is named in English "bore," and in French *marécart*. The cause of this phenomenon has been much disputed and no theory of it has as yet, we believe, been accepted as satisfactory; nor does Mr. Darwin seem by any means positive as to his own; nor is his statement of it very clear; but it appears to amount to this—that the tidal wave is very much retarded and checked by the friction of the banks in a narrowing river, and therefore the advance slope of it thrown up into a steeper angle, an effect aided by the pressure of the out-going stream. Still, this does not explain why so few rivers have bores, or why in those cases they are so irregular and capricious in their occurrence as they mostly are. Mr. Darwin has made a series of observations on the subject, of which this article is the result; but probably a good many more will be necessary before a full and decisive explanation can be arrived at.

The *Pall Mall Magazine* contains an article on Holland House, with illustrations of exterior and some of the rooms and the pictures, but not including any illustration of what should be the most interesting room in the house—the famous dining-room where so many eminent men were entertained and snubbed by the Lady Holland of an earlier generation.

The *Nineteenth Century* concludes Mr. Sharp's interesting article on "The Art Treasures of America," which gives details of the collections of some of the great private galleries, the most remarkable being apparently that of Mr. Walters, of Baltimore, who seems to possess a wonderful collection of modern pictures, including many which are of worldwide celebrity. What interests us most is to learn that he possesses the original "Hémicycle" by Delaroche, from which the great wall painting in the Ecole des Beaux Arts was made.

Under the heading of "The Field of Art" *Scribner* has an article on "Artistic Die-sinking of the Present Time," with some illustrations, chiefly from the unsurpassed work of M. Roty,



whose two heads of the French Republic, for two different medals, are admirable. It appears, from the article, that the United States National Academy of Design is proposing to establish a special class for instruction in medal engraving. We may recommend to our own Royal Academy to do likewise. Medal design is at a very low level in England, as compared with France at all events.

*Blackwood* contains a short article on a rather out-of-the-way subject—"Velasquez the Courtier," being an attempt to give an impression, more from hints than from positive history, of Velasquez as a man, and of the nature of the court life amid which he passed most of his time.

In the *Contemporary Review* Mr. Vaughan Nash makes a trenchant criticism on the recent action of the East London Water Company. One strong point he certainly makes. The Company excuse their shortcomings on account of drought. Mr. Nash observes "their engineers does not seem to perceive what is involved in his complaint about the drought, which he declares has been going on for thirteen months. 'The rivers and springs are all dry dependent on the winter rainfall, and last winter the rain did not fall. This is simply to plead guilty. Why did the directors wait till August to take action when they had this warning?' A question which we think the Company will find it rather hard to answer.

The *Revue Générale* contains, in place of its usual art article, an article by M. Georges Vaes on "Ma Visite au Congo," containing an account, with photographs, of the formation of a railway in that part of Africa by a French company. The same number contains also an article by M. Georges Bastin on "La Question des Accidents du Travail en France," giving a summary of the French law and practice in regard to compensation for injuries sustained by workmen on buildings or other works of construction.

*Knowledge* contains an article on, and photographic illustrations of, the recent large sunspots, the appearance of which is probably not unconnected with our abnormal weather on the planet this year.

The *English Illustrated* contains an article on "The Newest of Flying Machines," one designed by a Mr. Davidson; but we fear it is only of the class of what may be called pseudo-scientific articles.

We have received the *Genealogical Magazine*, the *Gentleman's Magazine* and the *Quarry*.

### COMPETITIONS.

**THE CALIFORNIA UNIVERSITY COMPETITION.**—The jury which met at Antwerp a few days ago to adjudicate on the preliminary designs submitted for this vast scheme have selected eleven competitors for the final competition, of whom three are French architects (of Paris), one Swiss, one Austrian, and the rest American. We thought no Englishman would be in the final competition; in fact, our expectation was that they would all be either French or American. We will give the names when we can be assured of giving them correctly. The only published list in an English daily paper is wrong to our knowledge in the spelling of one or two of the names, and probably in others.

**TECHNICAL SCHOOL, SMETHWICK.**—On the 10th inst., at a meeting of the Smethwick Technical Education Board, the plans of the new technical schools were submitted. Four plans were presented, two premiums (50*l.* and 25*l.*) being offered by the Board. It was stated that one of the conditions of the competition was that the total cost of the building should be about 5,500*l.* It was decided to submit for the approval of the District Council the set of plans marked "Experience," provided the cost of erection was in accordance with the stipulated provisions, and in the event of this condition not being complied with, it was decided to recommend the Council to accept the plans marked "Science and Art."

**NEW FEVER WARDS, LEIGH JOINT HOSPITAL BOARD, LANCAIRE.**—Mr. J. Fairclough, chairman of the Leigh Joint Hospital Board, opened on the 6th inst. the new fever wards which the Board have erected at the Leigh Sanatorium at Astley. The total cost of the land, which contains sixteen statute acres, of the old hall, the four new buildings for dealing with typhoid and scarlet fever cases, the walling of the grounds, and the furnishing amounts to about 18,000*l.* Messrs. Banks, Fairclough & Stephen were the architects.

### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday at the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee it was agreed to lend the Paddington Guardians 25,000*l.* for the purchase of land on which to enlarge the workhouse, and 15,500*l.* to the Poplar Guardians towards the purchase of the Forest Gate District Schools.

**Tramway Purchase.**—The Highways Committee recommended, and it was agreed:—That the Council do approve the estimate of 800,000*l.* submitted by the Finance Committee; and that the Council do enter into an agreement with the London Tramways Company for the purchase by, and transfer to the Council on January 1, 1899, of the whole of the company's undertaking (other than the two and an eighth miles of tramways and the Lawson-street depot, already purchased by the Council) for the sum of 850,000*l.*; and also for the payment by the Council of a sum to be agreed upon between the Council and the company, or, failing agreement, to be settled by arbitration, in respect of the provender and other consumable stores in hand at the date of transfer, and the unexpired terms of licences, excise duties, insurance policies, and other outgoings in connexion with the company's undertaking.

**The East End Water Question.**—The discussion was resumed on Mr. Crookes's motion with reference to the water supply in East London, which was as follows:—"That, in view of the existing difficulty in obtaining an adequate supply of water in a large portion of the county of London, it be an instruction to the Water Committee to forthwith submit its proposals with regard to legislation affecting the water supply in the ensuing Session of Parliament." To this Mr. Beachcroft had moved an amendment with the purpose of adding the words, "And also to obtain the opinion of the engineer as to what works are required to provide for connecting the mains and works of the several companies for use in case of emergency."

Mr. Dickinson, Chairman of the Water Committee, resumed the debate, and urged a unanimous decision on the resolution. He strongly advocated the necessity for an additional supply. He was prepared for the sake of unanimity to accept the amendment.

After further discussion, the debate was closed, and on a division the amendment was carried by 88 to 15 votes.

Colonel Ford moved a further amendment instructing the Water Committee to include in any proposed legislation powers compelling an exchange by the water companies upon terms to be settled by Parliament.

Mr. Dickinson refused to accept the amendment, which limited the action of the Committee. They proposed to bring in within a fortnight definite proposals, and they must have a free hand to deal with the whole question.

Only two voted for the amendment, and the resolution, as amended by Mr. Beachcroft, was carried unanimously.

**Private Slaughter-Houses.**—The Public Health Committee recommended:—"That, in the opinion of the Council, it is desirable that, as a first step towards ensuring the proper inspection of meat, private slaughter-houses should cease to exist in London, and that butchers should in substitution be afforded such facilities as are necessary for the killing of animals in public slaughter-houses to be erected by the Council. That a copy of this report and of the Council's resolutions thereon be sent to the Local Government Board, with an intimation that the Council is prepared to accept such responsibilities as may be necessary to give effect in London to the recommendations of the Royal Commission on Tuberculosis, and that the Board be asked whether they will include in any legislation introduced by them in connexion with the Royal Commission's report the provisions which would be necessary for this purpose."

Mr. Haydon moved that the recommendation should be referred back for further consideration, on the ground that there was no need of abattoirs in London. The matter was not one for the Council, but for the Government. He stated that the butchers would not use public slaughter-houses, even if they were provided.

Mr. Easton seconded the amendment. After

some discussion the further consideration was adjourned.

**The Telephones.**—The Highways Committee recommended, and it was agreed:—"That the attention of the Postmaster-General be called to the expression of opinion in the report of the Select Committee on Telephones, that general, immediate, and effective competition by either the Post Office or the Local Authority is necessary, and that a really efficient Post Office service affords the best means for securing such competition, and that he be asked whether, in view of that expression of opinion, it is his intention to take the necessary measures for establishing an official telephone system for the county of London."

**The Smoke Nuisance.**—On the motion of Mr. Fletcher, it was agreed:—"That it be referred to the Public Control Committee to report the steps they are taking to enforce the Public Health (London) Act so far as it relates to smoke nuisance, and whether they need additional powers for this purpose."

**The Supervision of Buildings.**—Upon the motion of Mr. Beachcroft, it was agreed:—"That, as the present system which obtains in London with regard to the supervision of buildings and the responsibility for their proper construction, both from a structural and sanitary point of view, is unsatisfactory, it be an instruction to the Building Act Committee to report fully on the subject."

The Council adjourned shortly after seven o'clock.

### ARCHITECTURAL SOCIETIES.

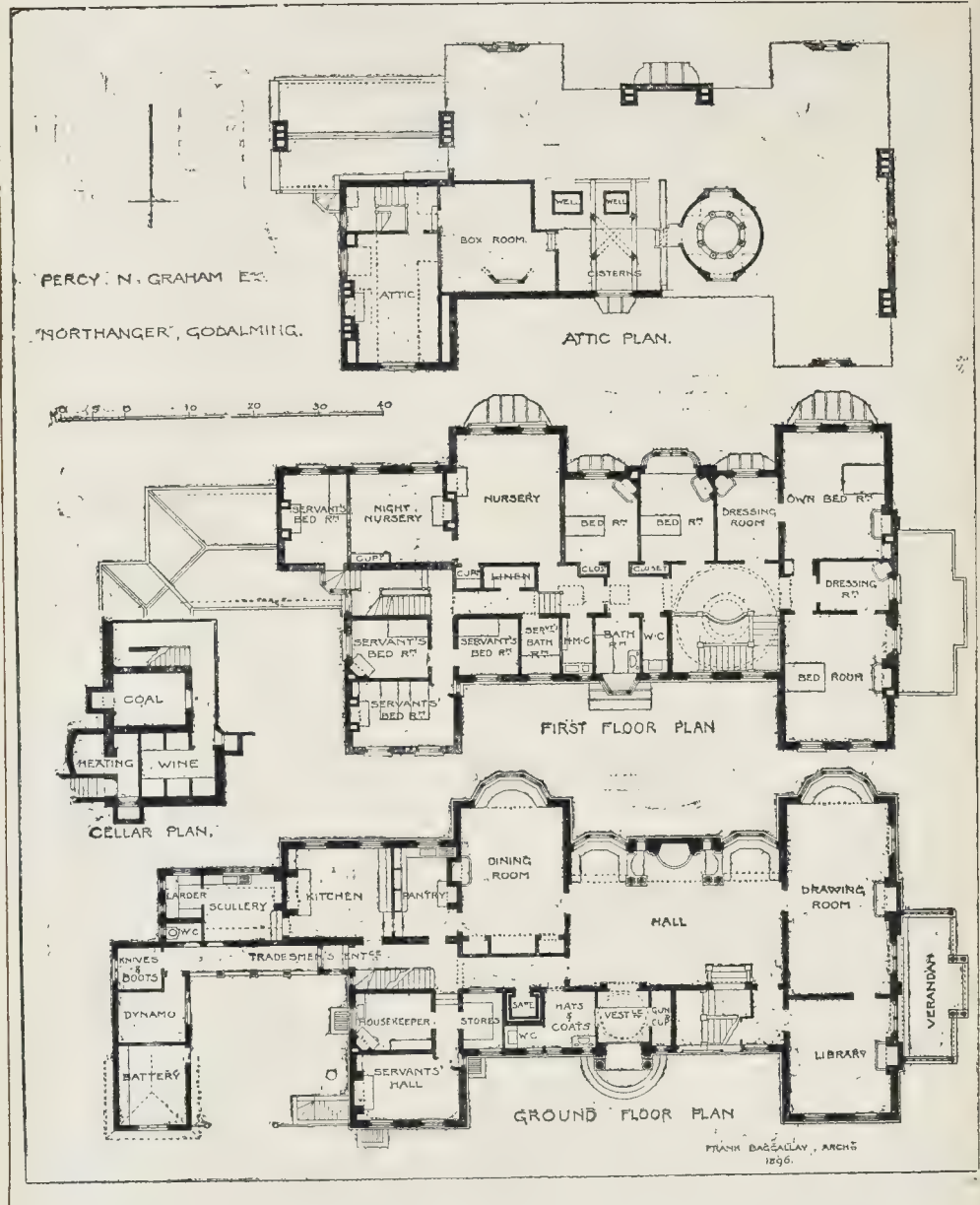
**GLASGOW ARCHITECTURAL ASSOCIATION.**—The usual monthly meeting of this Association was held on Tuesday, October 4, the subject for discussion being "Scottish Church Planning." Mr. Blain, in describing the development of the Presbyterian Church, traced the alteration in plan which the introduction of choir and organ had entailed. He pointed out that the service of the church had of late years undergone great modification. Nowadays the service might be considered in many cases suited more to the emotional than to the intellectual side of our nature. To plan a church for such a service, the chancel might be more fully developed; its sacred character could be heightened by a careful disposition of the light, by proper placing of the choir, and by the use of sacred symbols and emblems. A feature should be made of the Communion table rather than of the pulpit. Features might be made of pews, galleries, font, &c., while broad passages were needed for processional purposes. Mr. Whitlaw thought it a matter of congratulation that congregations were showing less of the dogmatic spirit which had hitherto prevented the Church from being developed on the lines suggested by Mr. Blain. Mr. Connor and Mr. Cragie maintained that the plan was developing on wrong lines. A church in which the preacher could be both seen and heard by his congregation still appealed to most Presbyterians as suited to their purpose. This, as Mr. Connor showed, did not militate against a church being also architecturally satisfying. Mr. Hill, in concluding the discussion, pointed out that much that was good of the pre-Reformation times might fittingly be revived in our modern churches.

### ENGINEERING SOCIETIES.

**SOCIETY OF ENGINEERS.**—On the 11th inst. the Society of Engineers paid a visit to the Central London Railway Works at the Post-office Station, E.C. We will give some of the particulars of the work in another issue.

**BOARD SCHOOL, CLAYTON, YORKSHIRE.**—A new Board School was opened at Clayton on the 3rd inst. The school is built on the central hall principle, and consists of two sections, divided by a partition. Accommodation is provided for 600 children—400 in the mixed department and 200 in the infants' department. The premises include a cookery-room, an art-room, cloak-rooms, and offices for both the School Board and the District Council. The school is heated with hot water, on the low-pressure principle. The cost of the building is covered by a loan of 9,000*l.* The architect was Mr. Abraham Sharp, of Bradford. The work has been performed by the following contractors:—Mason, Ephraim Balmforth, Queensbury; joiner, Ineson Taylor, Keighley; plumber, A. Walton, Clayton; slaters, J. Smithies & Sons, Bradford; plasterer, S. Sunderland; heating apparatus, Hargreaves & Dewhurst, Bradford; painter, W. Sharp; ironfounders, Taylor & Parsons, Bradford.





### Illustrations.

#### DESIGNS FOR DECORATIVE PAINTINGS.

THE two designs or studies reproduced here are from pencil drawings by Mr. N. H. J. Westlake, exhibited at the last Royal Academy.

The two angels form part of an "Aureola" of angels grouped around the figure of Christ in the subject of "The Transfiguration" at the Priory, Hayward's Heath. The figures are about 10 ft. in height.

The "Sorrowing Magdalene" is a study for a portion of a large triptych at St. Thomas's Home, Basingstoke.

#### ST. PETER'S CHURCH, BARNSELY, YORKS.

This church, of which Mr. Temple Moore is the architect, is built of brick, faced externally with local red bricks, and plastered inside. The whole of the stonework, both inside and out, is in sandstone, from the Real Old Oaks Quarries, near Barnsley. The roofs are covered with grey Westmoreland slates, in courses of graduated size. The vestries, which are in the basement at the east end, are paved with pitch pine blocks, and the church with concrete slabs, in alternate squares of red and white, with Tadcaster stone steps, kerbs, &c. There is a deal skeleton dado, with cement panels, to the walls of aisles. Up to the present time only the east end of the church, comprising the chancel, aisles, chapel, and vestries has been built. The

builder is Mr. Aaron Moore, of Barnsley. The drawing was exhibited at the Royal Academy of 1897.

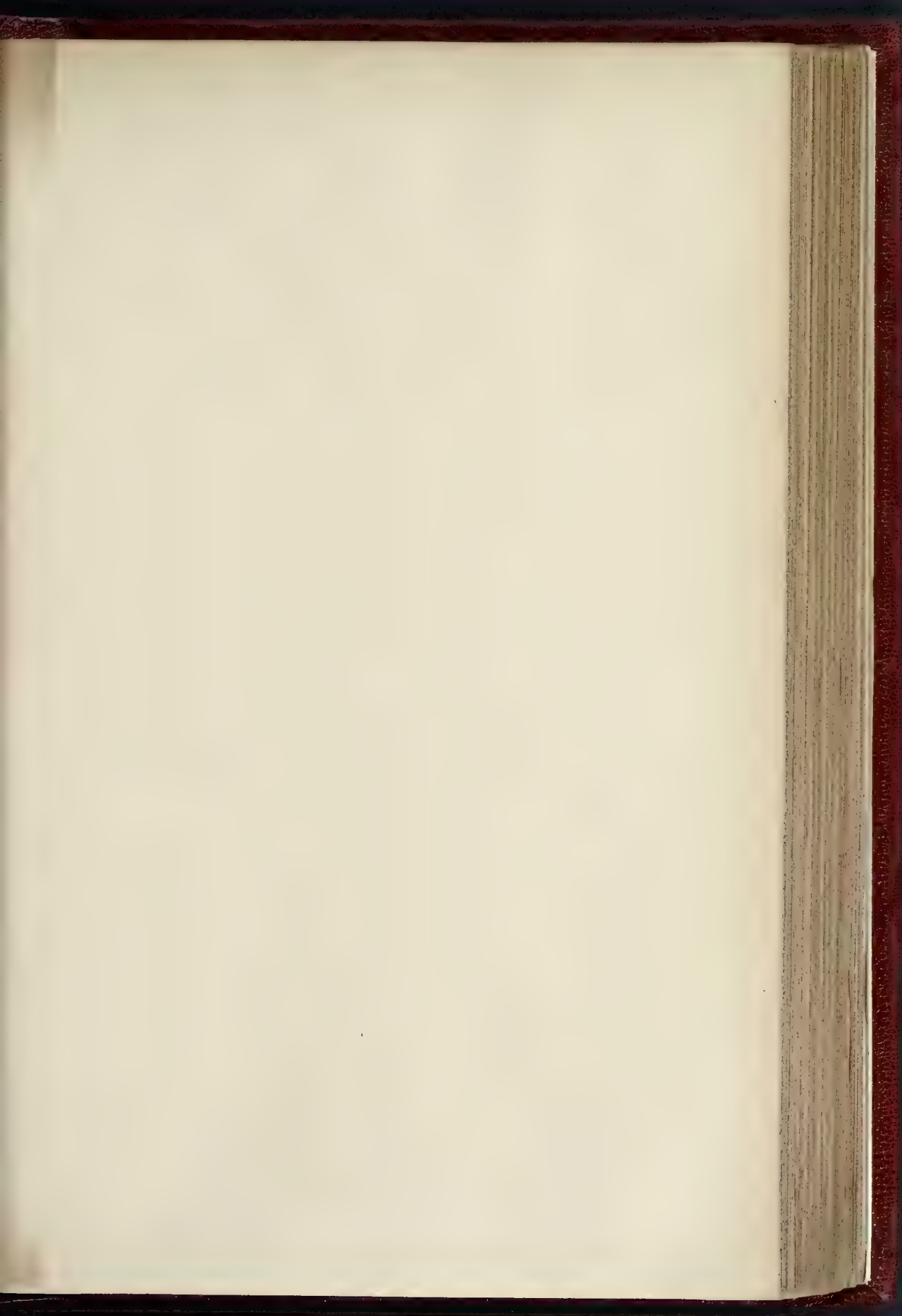
#### CHRIST CHURCH, MOSS SIDE, MANCHESTER.

This church, now in course of erection, is intended to take the place of the mean and unsightly structure which for many years has been the only provision for the wants of a large and important parish.

The general arrangement is shown in the illustration and plan, which is reproduced from the architect's drawing exhibited in last year's Royal Academy; but, owing to lack of funds, the parish room over the choir vestry has for the present been abandoned.

The ridges of nave and chancel roofs are









CARTOONS FOR  
DECORATION.

BY

N. H. J. WESTLAKE.

I.

STUDY OF ANGELS.

II.

BEMODDEN MAGDALENE.



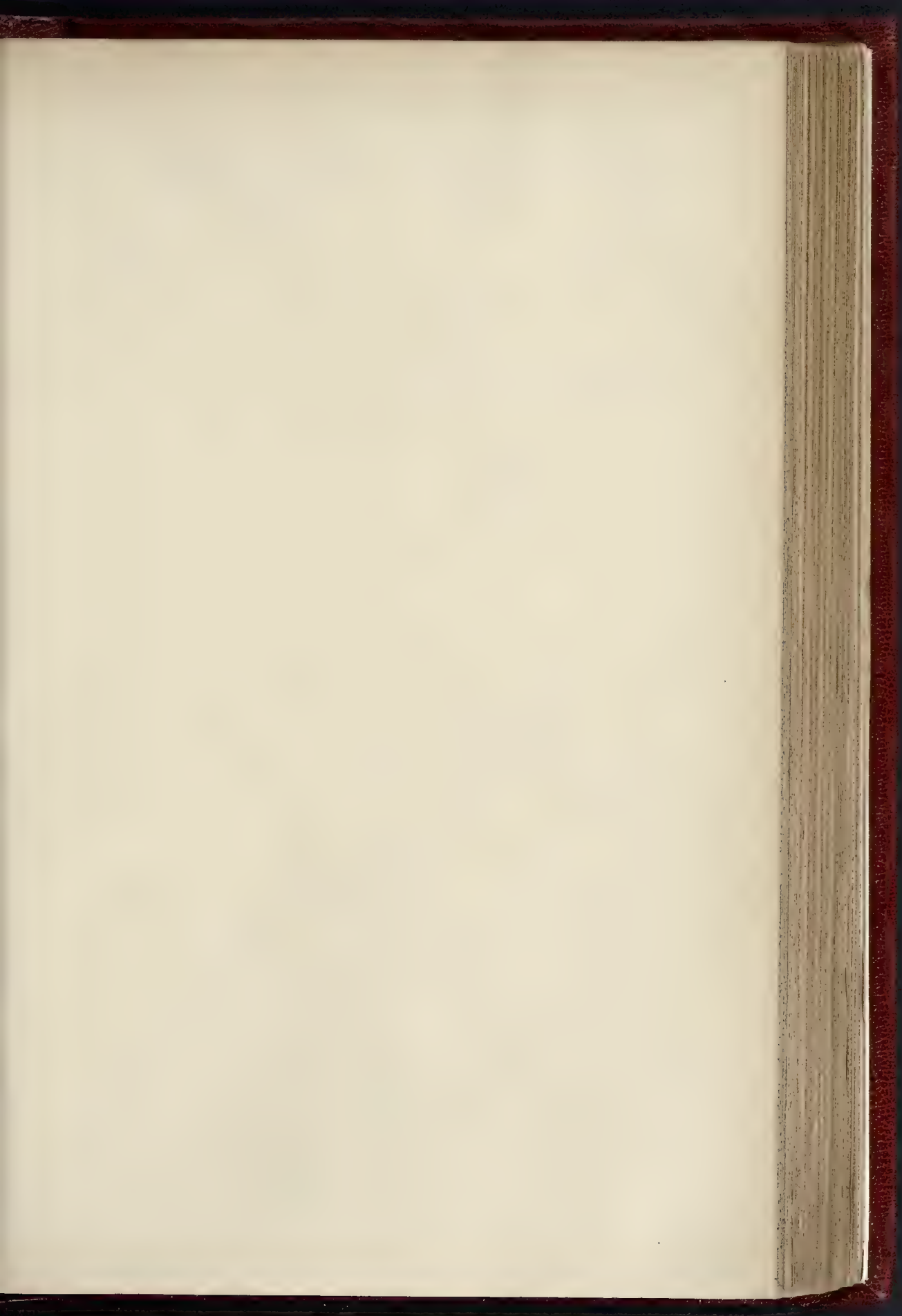








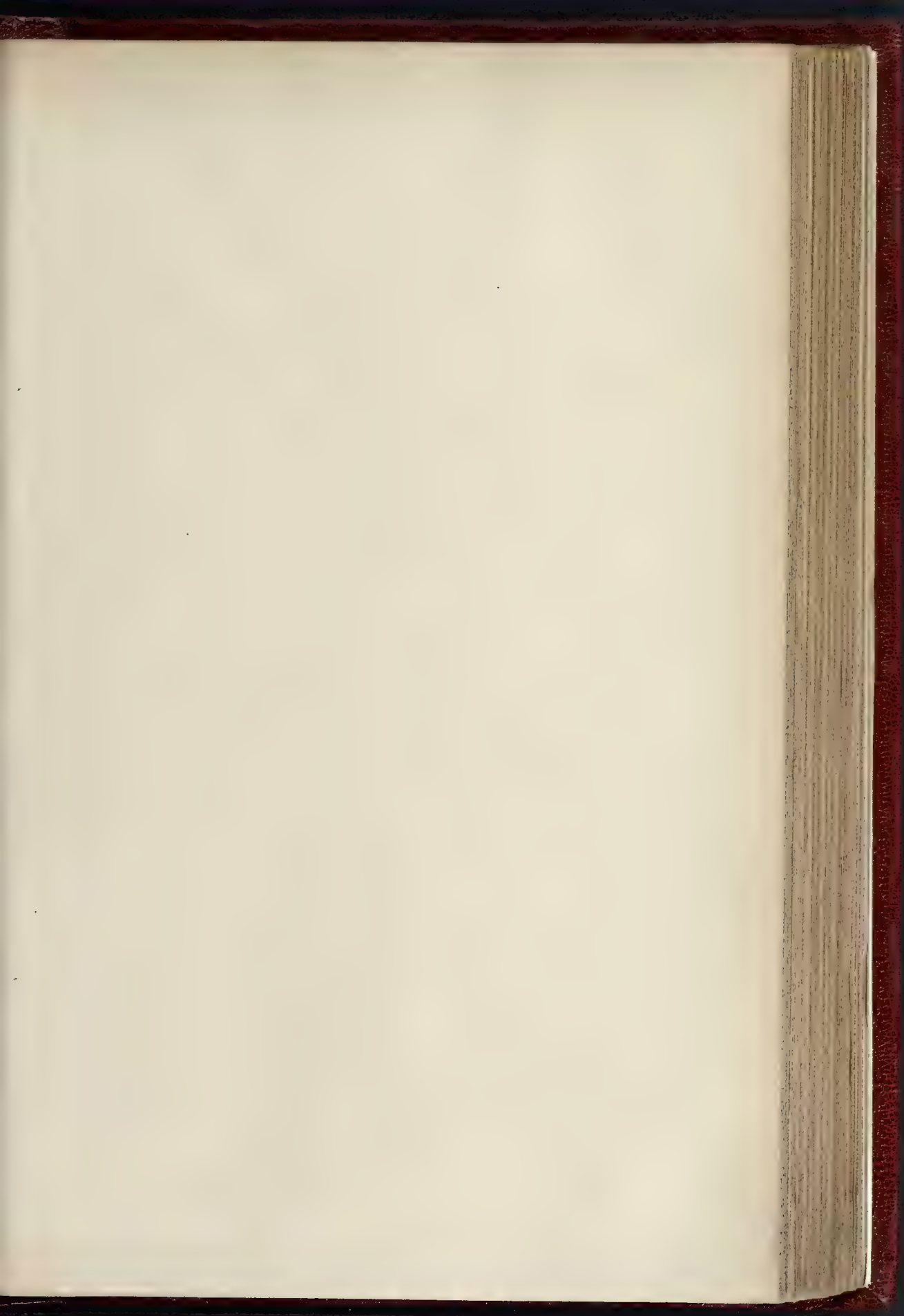




THE BUILDER, OCTOBER 15, 1896.





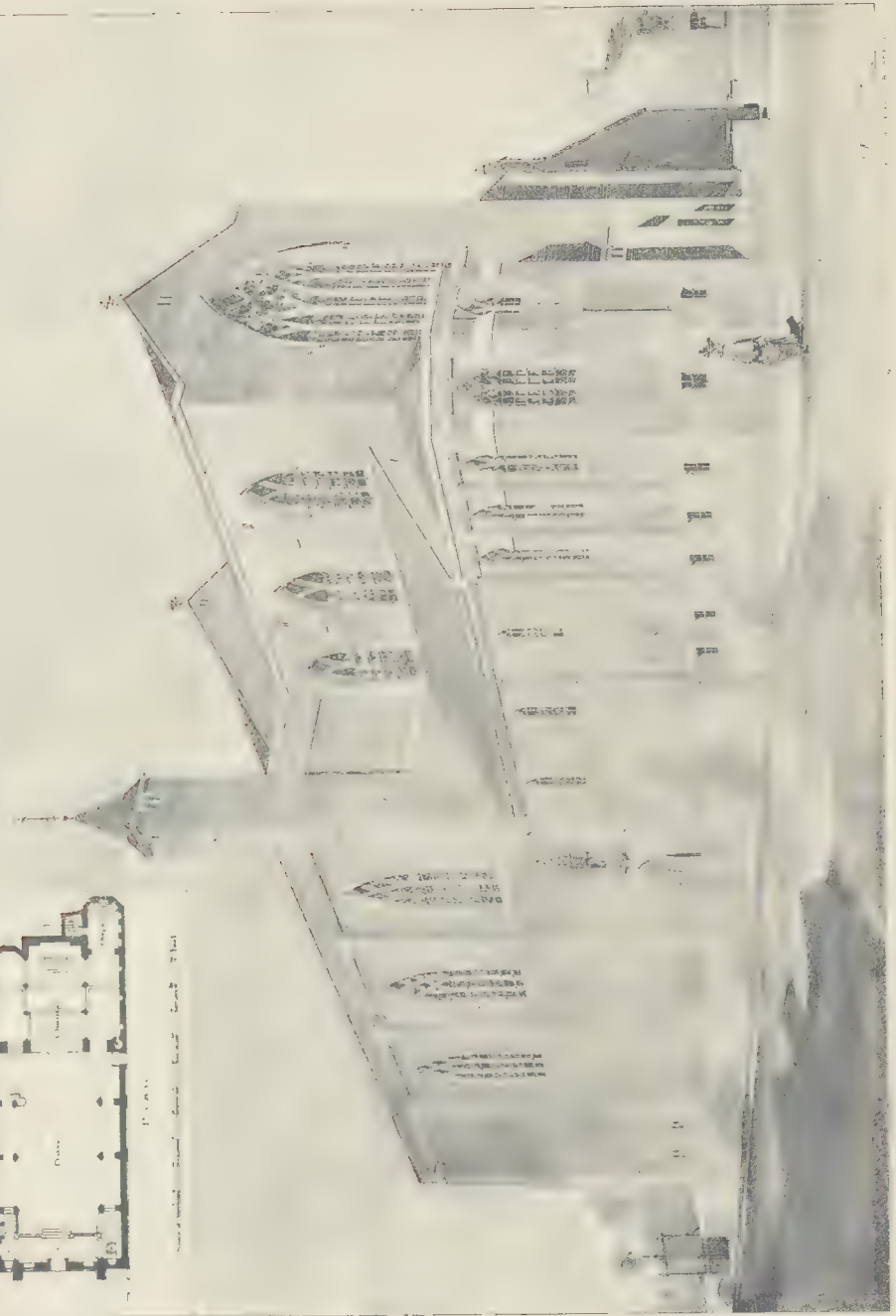


THE BUILDER OCTOBER 1889

ST PETER'S BARRINGTON.



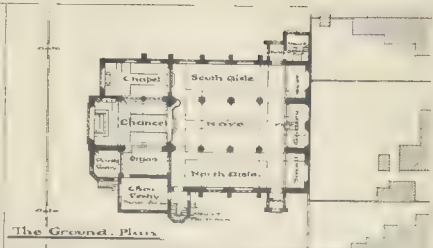
Scale of Feet  
 0 10 20 30 40 50 60 70 80 90 100





• Christ Church •  
• Moss Side •  
• Manchester •

M<sup>r</sup> W. Cecil Hardisty  
Architect.





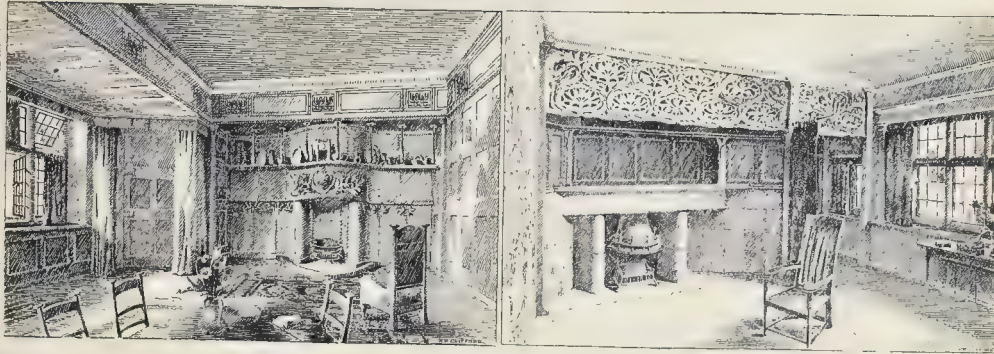




"NORTHANGER," GODALMING THE HALL—MR FRANK BAGGALLAS F.R.I.B.A. ARCHITECT



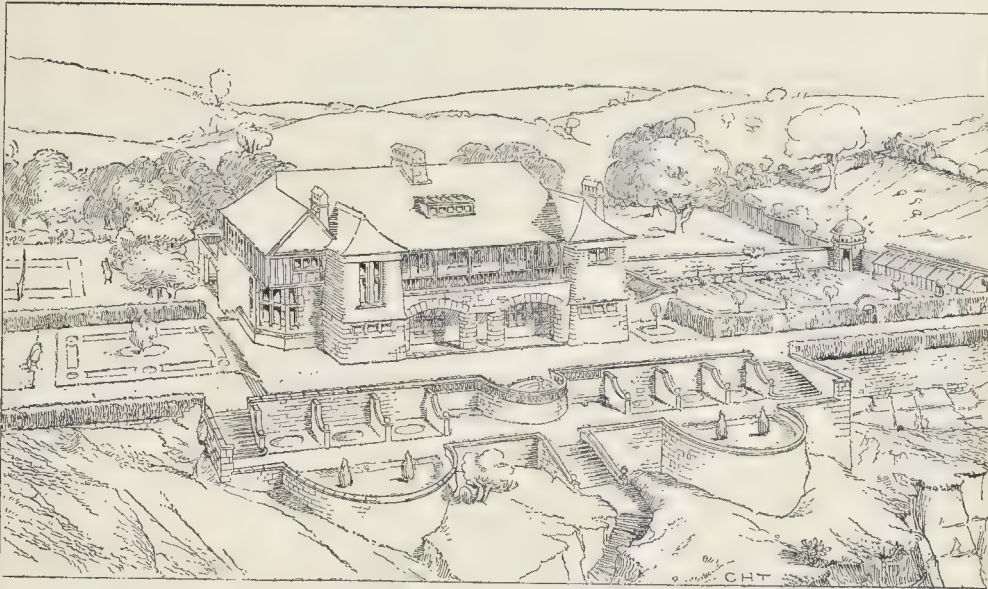




Dining-room.

Sketches of Interiors, "Cliff Towers."

Drawing-room.



"Cliff Towers": General View from Garden.

level throughout; the height from the nave floor being 59 ft., and to the panelled barrel vault inside 49 ft.

The work is being proceeded with in sections, the first portion, consisting of chancel, chapel, and vestries, having just been completed.

Bolton pressed bricks have been used for the wall-facing both inside and out, and Rainhill stone for the window jambs and tracery, and all minor architectural features.

The walls of the sanctuary are panelled in oak to a height of 9 ft., and on the south side is a handsome oak sedilia with elaborate tracery in the panels of the projecting canopy. The choir stalls, as well as the screens enclosing the Lady Chapel and organ-chamber, will also be in oak of an ornate design.

When complete the church will accommodate 750 persons. Mr. W. Cecil Hardisty, of Manchester, is the architect.

#### "NORTHANGER," NEAR GODALMING.

This house with stables, lodges, &c., was recently erected on an estate beautifully situated on the high ground of Munstead Heath, near Godalming, overlooking the country to the south. The entrance and all the minor apartments are on the north side, leaving the south

aspect for the principal sitting and bedrooms. The walls are faced with Lawrence's orange red bricks and the roofs covered with Buttermere slates. The house and stables are lighted by electricity, the installation of which was in the hands of Messrs. Drake & Gorham, of Westminster; and an excellent and abundant water-supply was obtained from a boring on the site to a depth of nearly 200 ft. made by Messrs. Le Grand & Sutcliffe. The oak joinery of the hall and staircase was executed by Messrs. Gregory & Co., of Regent-street. Mr. Walter Wallis, of Balham, was the builder, and Mr. Frank Baggallay the architect.

#### CLIFF TOWERS, SALCOMBE, DEVONSHIRE.

WE publish this week further drawings of Cliff Towers, of which a perspective sketch exhibited at the Royal Academy, showing the corner of the entrance front, appeared in our issue of September 10. In the short description of the house then published it was mentioned that the materials are, for the lower portion of the building, the local grey-green stone, while the roof is covered with Tilberthwaite sea-green slates, which are also employed for the vertical wall covering of the north or garden elevation and the four

towers. The plans will show that the house is so arranged as to allow all the rooms to face south and to command a view of the Salcombe estuary.\*

As regards the interior of the house, the whole of the walls are panelled in plain, unmoulded deal panelling, painted white. The solid wood block floors throughout the house are stained green and beeswaxed. The only room which is papered is the drawing-room, for which Messrs. Essex' arboreal paper, designed by the architect, will be used.

The dining-room mantelpiece shown in the small perspective sketch is treated with rough hammered copper, a small portion of the face of which is repoussé. The slab is of Rouge Royal marble. The small balusters are turned in gun metal. The drawing-room mantelpiece, both as regards jambs and flat portion, is in Cipollino marble. The carved screen work is in American walnut, slightly oiled; a suggestion of colour is introduced in the design, the tip of the leaves being "smudged" with green, and of the blossoms with yellow.

C. HARRISON TOWNSEND.

\* We have no doubt the statement is correct as to the aspect of the house, but there is no compass pointer on the plans. We mention it because this is an addition to a plan which is so often omitted.—Ed.



# THE ARCHITECTURAL ASSOCIATION SCHOOL OF DESIGN.

THE preliminary meeting of the School of Design of the Architectural Association was held at 56, Great Marlborough-street, W., on Tuesday, when addresses were delivered by the President of the Association (Mr. Fellowes Prynne), Mr. Aston Webb, and Mr. Cole A. Adams.

In the opening portion of his address Mr. Fellowes Prynne, after mentioning the steps which had been taken to render the School of Design less costly and more useful—especially noting the arrangement that in future the same visitor would always take charge of and criticise the same design till it was worked out, said they were anxious to make the School of Design, combined with the Studio work, the most popular and useful section in the whole of the Architectural Association scheme of education. After urging the students to make the most, while young, of the educational advantages now within their reach, so much greater than those which the last generation enjoyed, he observed how much was comprised in those four words "The study of design," and how many times during the past century it had been thought that a sure foundation for principles of study had been found, and how many times this had been upset by the shifting sands of fashion and individual opinion. He continued "Putting aside for the present, the individual faddists, or, as some unkind people might call them, 'maddists,' we come face to face with three Schools of Thought:—One that would prefer to accept the traditions and the fashions of the past ages, as the most perfect, and adhere to absolute correctness of style—which for convenience we will call the 'Stylographic' school. Another which, while accepting the traditions, and fully appreciating the beauties of Classic, Gothic, and Renaissance work, &c., and using the study of the same as the foundation of all good work, yet aims at blending what they feel is best in past work, and so gradually developing something new and original, although built upon old foundations. This may be termed the 'Eclectic school.' A third, that would discourage the acceptance of traditions, or study of the styles of the past, and try and again commence at the beginning of things; bring the building, in fact, back to a state of nudity, and commence again the process of creating new styles and fashions for its decoration, and, further, would tempt the architect away from much that has been considered necessary in the past, such as the sketching and measuring of old work, except only so far as it tends to make them ideal craftsmen, as well as architects. One is tempted to call this the 'crafty school,' but as this might be misunderstood, we will be content to call them by the good old name of the "Arts and Crafts" school. . . .

Much that has been written and said of late years, the bitterness that has been, at times, mixed up with argument by certain men of extreme views, has done but little to advance the cause they would uphold. On the other hand, the plain, outspoken, honest opinions of men who are known to have knowledge, experience, and ability at their back have received, as they always will, the careful consideration of the best thinkers and hardest workers in the profession; and undoubtedly these views, if not accepted as a whole, have had an invigorating and helpful effect in many ways upon the profession generally. . . .

We as an Association accept as a fact that there is much good in all these schools of thought, and we do not hesitate to advise pupils to study well the early history and development of architecture. We confine their studies to no particular date or style; we encourage them to appreciate what is beautiful in form and ornament, and we leave them unrestricted opportunities, and encourage them in every way possible to show their own individuality in design. And, further, we wish to encourage them in the study of the craft side of their art, not, however, necessarily to become craftsmen themselves, but as a necessary accessory to perfect design.

Time is far too short for me to enter upon even the fringe of such a subject of debate as the best manner of teaching and learning to design, but personally my strong advice to you is to follow the course laid out for you in our curriculum—a curriculum that is, as I have before said, both simple and comprehensive, and in no way exclusive.

By no means neglect in any way the early

study of the history and development of our art. Don't put yourself on the pedestal of a false god, and puff yourself up with the idea that you can create something out of nothing. All that is beautiful in man's architectural creation in the past is simply a gradual development of man's powers of design, which, however, is like all other evolution of gradual growth, and built up upon what has gone before. The more careful the study, and the fuller appreciation of all that is beautiful in old work of whatever style—the more large our capacity for grasping the best points in designs of the past, the more likely shall we be able to 'design with beauty and build in truth.'

I do not for a moment wish to assert my own opinion that this or that mode of learning to design, or this or that style of work is right or wrong, but all experience in nature, history, literature, art, and science teaches one lesson that I dare not ignore in dealing with our own art of architecture, and that is that, unless we build upon the foundations of past experience, unless we make use of the ladder that has been gradually raised for us by the genius of past artists, the result in design will be chaos. In saying this, do not please imagine that I am advocating the slavish copying or repetition of styles. My sympathies are entirely in another direction. I should also deprecate as strongly as any one, the idea of a long period of a student's valuable time being taken up by the study of Classic orders and Gothic styles.

But my contention is that our early education should be based on all that is best in past work, whether in style, ornament, proportion, or construction, so that our future designs, however free and untrammelled by previous styles they may be, may at least be free from the vulgarity and eccentricities that so often pass for cleverness, but are, in reality, only a thin cloak to hide ignorance, as in the case of the Impressionists' art in painting, which in the hands of a clever and expert painter can be made so beautiful, is often only adopted by an inferior painter to cover ignorance and bad draughtsmanship; so it may be, and so it often is with eccentricity in architectural design.

Yet at the same time, if we ever want to get any originality and freshness in design, we must not be afraid of eclecticism and the free treatment in design.

There was, perhaps, no man who scared and horrified the men of the stylographic school more than the late J. D. Sedding, by his boldness and freedom in design and clever eclecticism, and yet there is no man whose genius and architectural enthusiasm has had a greater influence upon our art during the latter part of the nineteenth century—and at the same time there is no man who entered more fully into the spirit of ancient work, none who was more saturated with the principles of Mediæval work, or who sympathised more with the motives that inspired the Renaissance movement. It was a thorough knowledge of, and sympathy with, the exquisite proportions of Classic, the absorbing beauties and developments of Gothic, and a love for the freedom of Renaissance work that made the blending of all, with his own artistic feeling and ideas, such a success. It is the want of such knowledge and sympathy with the past that so often leads his would-be copyists to utter failure in design.

Again, I must strongly advise you not to be drawn away by the theories of any school from the principle of making sketching an all-important part of your study. It seems almost incredible that any real artist should decry the necessity of sketching, and yet in the endeavour to press the hobby of craftsmanship amongst architects, the art of sketching, it has been stated, is an unnecessary qualification. Do not, I say, be led astray by such theories. If you think that actual craftsmanship is desirable, and undoubtedly to some extent it is, by all means make it part of your study, but on no account for this reason neglect your sketching. By sketching freely you will fill the storehouse of your mind with ideas, for sketching will leave a far more indelible impression than reading, notes, or even the most careful survey of work. It will help more than anything else in design, and it will enable you to illustrate your ideas to others with a rapidity and preciseness that you will find most valuable. Your first business should be to become a good draughtsman—and make it your especial care to be correct in your drawing, as few things are more injurious to the architectural draughtsman than slovenly and incorrect drawing.

Having suggested the line of early study, let us now consider for a few moments the best way of applying that study to design. When starting on a design, the first thing before putting pencil to paper is to endeavour to acquire the habit of seeing clearly in your mind's eye what you want to design. By picturing your design in your own mind before attempting to draw, you will not only save time, but prevent much confused work. It is necessary that you should see in your mind plan and elevation together, and train yourselves to realise the effect of a building in perspective from different points of view. To enable him to do this with greater ease, the student will find that it is a great help to continually sketch small portions of his proposed design, quite roughly with chalk on the blackboard, or a piece of charcoal, or soft pencil on paper.

The great use of these small rough perspective sketches will very soon become apparent, as by their aid you will find out many small oversights, and weak points that might otherwise easily have escaped you. When designing a building let the perfection of plan be your first and all-important aim—at the same time, whilst planning keep in mind, as far as possible, both internal and external effect of your plan arrangement. But remember that however fine an exterior may be, it can never atone for a faulty internal plan. If you want your plan to give pleasure, whilst studying convenience in every way, avoid making your rooms merely a set of parallelograms or what I might call a T square and set square house of the common type. It is by a reasonable and harmonious variation of the plan, that charm and artistic effect will be obtained both internally and externally. . . .

Clients, as they sometimes do, insist on a design in a certain style; still the hand of the true artist will, while adhering to the principle of the style chosen, so adapt it and mould it to his own feelings that it will bear the undoubted marks of his individuality and originality. . . .

As regards ornament, I cannot too strongly advise you in your earlier attempts in design to leave ornament alone. Try and get your effects by simplicity of treatment, by the masses and grouping. A building that is not good in itself and in its proportion can never be redeemed by ornament. The very practice of reserve necessary for simplicity of treatment is an excellent training. Many more buildings are ruined architecturally by the misapplication of ornament than by plainness of design.

But with ornament remember that nothing is a more sure test of a man's intelligence and refinement when it is properly used, and nothing stamps the ignorance and vulgarity of a man more than bad or misused ornament. Ornament in design should never have the effect of being simply stuck on without definite reason.

The task of the artist in the formation of the constructive parts of a work is so to shape and connect all the details as to cause the whole to develop itself as it were organically. Any creation is perfect in exact proportion to the perfectness of the parts of which it is composed. Any work of art is perfect by the perfection of its parts, and by the organic relation in which those parts stand towards one another, and towards the whole. By such formation of the constructive and ornamental parts of a design, correct in themselves, correct in their relation to each other, and correct in their union as a whole, there will be produced a work in harmony with the laws of style, which, being the free creation of the hand of man, will express the use and purpose of its existence in a clear and intelligible way, and, like speech itself, will be the expression of the intellect and genius of its originator."

## Planning.

The Chairman then called upon Mr. Aston Webb to address the meeting on the subject of planning. Mr. Webb said that he had not prepared a paper for the occasion; what he wished to do was to give them some of the ideas which had occurred to him from time to time, with a few explanations on the blackboard. The subject of planning had been ably dealt with by Mr. McVicar Anderson and Mr. Alfred Waterhouse while they occupied the position of President of the Royal Institute of British Architects, and he referred his hearers to those addresses for a good deal of most useful advice on the subject. Mr. Waterhouse's address, prepared at the time he was interested as assessor



in the designs for the Sheffield Town Hall, contained a number of principles as to the internal planning of public buildings which were invaluable to students. One of the first things to be thought about in planning was the placing of the building. Nothing was more important to the success or otherwise of a building than the way in which it was placed on the ground, and yet sometimes an architect rather overlooked this and concerned himself almost entirely with the internal arrangements of the building. In London and other large towns the opportunities for satisfactorily placing the building were extremely limited—that was to say, an architect was governed, and no doubt properly so, by lines of frontage and the by-laws of the local authorities. The first thing in a successful plan and design—and one could not separate plan and design—was the idea or general principle. Architects sometimes devoted all their thought to the trivialities of the design, and forgot the general idea; and he would suggest that it was not good starting on a public building or a house until they first evolved some general idea—some scheme which, directly it was realised, was recognised as possessing an idea. In making plan they should not attempt to do it to a large scale. The smaller scale they did their plans to at first the better. The walls could be represented by lines, and the thickness of the walls need not be troubled about. Where they could, it was of great advantage to be able to place a building at right angles to the line of approach. It could hardly ever be done in London; but in domestic work it could very often be done, and they all knew the great effect of a house at the end of an avenue. A house standing by itself in a field, as some landscape gardeners liked to place it, was rather a poor thing, even when the architecture was good, but approached by an avenue, whether the architecture was good or bad, there was some sort of effect, which could not very well be spoilt.

The site of the National Gallery was called, in a very exaggerated way, the finest site in Europe. Why was that? It was, in his opinion, because it had an approach up Whitehall, and it rose at the end, and very few sites in London had that advantage. As a rule a building was placed sideways in a street, and it was to be regretted that the new public buildings in Whitehall were to be placed in that position; they would be parallel to the street instead of at right angles to it. In foreign cities a great point was made of this. In Prague, which was a comparatively small place, they had lately built a new public building, and placed it across their widest street. It was a rather commonplace building, but it had a very imposing effect owing to its approach, and it added greatly to the dignity of the town. There was another case in London—the Mall and Buckingham Palace. He had often wondered why the Mall had so little effect, why it seemed so poor, until he realised this. As the Palace could not be at the end of the Mall, in order to get something like the way of a central line a row of trees had been placed down the centre of the Mall, the consequence being that the avenue was split up into two, and there was no grandeur or importance about it. The Houses of Parliament were a magnificent and picturesque group, but one regretted that the full length could not be seen from the principal thoroughfare. The longer he lived, the more symmetrical his views became in the matter of arrangement of public buildings. Picturesqueness was perfectly right in buildings of less important character, but for public and monumental buildings we ought to strive for symmetry and grandeur. In the case of Regent-street, which was a well-laid-out street (and they were indebted to the Crown for this, the only well-laid-out street of the century, though the County Council's new street from Holborn to the Strand promised well), one thing the street wanted was somewhere to lead to. Regent-street did not lead straight to that fine street, Portland-place; there was an unhappy break between them. A great street with nowhere to lead to was like an avenue without a house at the end of it. It was not absolutely essential that buildings should be in line with the street. The by-laws would not allow a building to project beyond the line of front, but there was no objection to putting one end back a little way. Take the case of Whitechapel Church, which was built by his old friend Ernest Lee, who was in the Class of Design with him a good many years ago. The church was not placed

parallel to the street but at an angle to it, and any one who walked down Whitechapel would regard that as a happy inspiration of the architect, for it broke the monotony of the terrible rows of houses on either side of the gloomy and unhappy thoroughfare, and displayed the building to effect. In public buildings it was important to attempt to get right angles. There was a great tendency, especially in London, for streets to cut in at all sorts of angles, and presenting acute angles which were difficult to deal with. The Home Office was a case in point. No system of planning could apply alike to public and private buildings. The objects were different: in a public building what was wanted was direct access and perfect simplicity of plan, and if any of his hearers should be going in for a competition, he would advise them to spare no time in trying to make the means of communication between the different parts as simple and plain as possible. In a private house it was not desirable to let everybody know where all the rooms were, and the problem was entirely different. It was a pleasure to a hospitable man to show his friends over his house, but if they knew the arrangement beforehand, as they did in most London houses, that delight was denied him. In the planning of public buildings, straight corridors were essential—broad, straight corridors from the entrance, with branching corridors on either side. Of course, the corridors should be properly lighted. The planning of public buildings had enormously improved, and the problems put before architects were much more complex than what was to be seen in ancient buildings. Whatever might be said about design, planning was incomparably superior to what it used to be. One question that had been raised very prominently in connexion with the competition for the new Admiralty and War Offices was the lighting of the corridors, and Mr. Christian, who was the architect advising the Government at the time, said he would not recommend any design that had dark corridors. The Home Office building had, no doubt, been much condemned on account of its dark corridors; certainly the corridors of a public building ought to be properly lighted; that was one of the first things to consider, for it was not a petty triviality, as it influenced the whole design. The selected design for the new Admiralty Office suggested a way of lighting corridors which was more or less new, and the scheme had been carried out and had answered very well; the corridors were very well lighted. Instead of having corridors with rooms on both sides, there were two corridors, with rooms down the sides, the corridors being lighted by courts in the centre, 25 ft. wide. There were disadvantages, of course, to that arrangement; it rendered the communication between rooms on opposite sides more difficult; separated them too much. Another point about corridors was that it was not well to light them all the way down exactly alike. The corridor could be divided into bays, each alternate bay being lighted. Halls in public buildings were much finer entered at the end than from the side, and where possible they should always be planned so as to be entered at the end. Mystery in a public building was just as important as in a private one, but it must be gained in a different way. With our atmosphere it could generally be obtained in the height and arrangement of the roof. Any one could see that who went into Westminster Hall and looked up at the roof. He recommended them to consider the advantage in large apartments of the mystery of the open roof, and also the increased facilities for sound which it afforded. Sound came into the subject of planning, but it was too large a question to deal with then, and for want of time he must omit many other little points he might have referred to. Vaulted rooms and vaulted churches were more difficult to hear in than open timber roofs, and a plaster barrel ceiling was about the worst arrangement for sound. In a town hall they should not put the boiler-house under any principal rooms of the building. The Town Clerk, or other officials, usually objected. Although he was strongly against putting the kitchen at the top of a house in a private building, he thought that was the place for it if it had to be provided in a public building. The staircase in public buildings should be placed at the end of a corridor, at the end of the main approach. In a private house, when the staircase only led to bedrooms, it should be put rather out of the way.

Speaking of the mystery which was to be aimed at in the planning of a private house, Mr. Webb referred to a small house which a well-known architect had designed for himself, which was excellent in the suggestion of mystery which it conveyed. One rather looked for little surprises in private buildings; they rather added to its interest, and were appreciated by the owner as well as friends who came to see him. It seemed almost unnecessary to say that it was undesirable to arrange rooms which would not get some sun. Mr. Christian was very emphatic on this point. The Italians had a motto, "Where the sun does not come, the doctor does."

Mr. Webb then spoke of the proper arrangement in private houses of the sitting-room and bedrooms, pointing out some rather frequent errors in placing doors and fireplaces. In conclusion, he said that one reason why he was present that evening was because he had received in past times so much good from the Class of Design, and it was a pleasure to respond to the President's request. He had been reading recently a poem by Rudyard Kipling, at the end of which there was something about the happy hunting ground of artists. The author described the place and proceeded:—

"And only the Master shall praise us, and only the Master shall blame;  
And no one shall work for money, and no one shall work for fame;  
But each for the joy of the working, and each, in his separate star,  
Shall draw the thing as he sees it for the God of things as they are."

That was the spirit in which they should enter into work. About thirty years ago he was secretary of the School of Design, and about twenty-seven years ago he was chairman; and occasionally he looked at the faded drawings made in those days which he had the arrogance to call designs. Whenever he looked at them he thought of those enchanted days when he did not draw for fame or money but just for the love of the thing, with fellow students who then, as now, were his friends.

Mr. Cole A. Adams then read a short paper on colour. In the course of his remarks he said that the use of colour in design was apparent, but the question of how much colour should be used was a question of degree. From Nature we learnt a principle, which was that all design must be expressed in colour—how expressed depended upon the ability of the designer. Nature came to the aid of the architect in the case of a building, and coloured it for him. In town and city what wonderful effects were produced! Think of Westminster Abbey and St. Paul's Cathedral. Poor and mean buildings could not stand the test of time. Then Nature did her best half-heartedly, and Time never rested until the tricks of the builder were exposed.

On the motion of the Chairman, a vote of thanks was accorded to the lecturers, and on the suggestion of Mr. Webb the thanks of the meeting were accorded to the Chairman.

The meeting then terminated.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting last week of the London County Council, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Space at Rear and Extension above Diagonal Line.

**Brixton.**—That the Council do, in the exercise of its powers under Section 41 of the London Building Act, 1894, allow a modification of the provisions of that Section with regard to open spaces about buildings, so far as relates to the proposed erection of two blocks of four-story flats, with shops on the ground-floor, on the north side of Landor-road, Stockwell (Mr. J. E. Lamerton).—Agreed.

##### Open Spaces about Buildings.

**Battersea.**—That the Council do, in the exercise of its powers under Section 41 (1) (vi.) of the London Building Act, 1894, allow a modification of the provisions of that Section with regard to open spaces about buildings, so far as relates to the proposed erection of an addition to the Fire Brigade station, Simpson-street (Superintending Architect, for the Fire Brigade Committee of the Council).—Agreed.

**Bethnal Green, South-West.**—That the Council, in

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



the exercise of its powers under Section 41 of the London Building Act, 1894, do not permit of the erection of a building with a one-story shop in front on lot 14 of the Council's land, on the east side of Ainsworth-street, at the corner of Church-street, Bethnal Green, with an open space at the rear (Mr. C. R. Peters).—Agreed.

#### Deviation from Certified Plans.

*St. George, Hanover-square.*—Deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed erection of a block of residential flats, with shops on the ground floor, on the site of No. 130, New Bond-street, and premises at the rear abutting upon Grosvenor-street (Messrs. Boehmer & Gibbs for Mr. T. L. Green).—Consent.

*Strand.*—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed re-building of Nos. 31 and 32, Haymarket, and premises at the rear fronting upon Arundel-place, St. Martin-in-the-Fields (Mr. J. Scott for Messrs. Brecknell & Turner, Limited).—Consent.

*City of London.*—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed re-building of the "King's Arms" public-house, Water-lane (Mr. H. M. Wakley for Reid's Brewery Company, Limited).—Refused.

*St. George, Hanover-square.*—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed re-building of Nos. 5 and 6, Stanbrook-court, Old Bond-street (Messrs. H. E. & W. Bury for Mr. H. W. Hill).—Refused.

*Holborn.*—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed erection of a building to be known as Cranston's Waverley Temperance Hotel, in Southampton-row, Bloomsbury, to rear upon Compton-place (Mr. G. Waymouth for Mr. R. Cranston and others).—Refused.

*Lambeth, North.*—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed re-building of Nos. 165 and 167, Waterloo-road, and certain premises at the rear abutting on Asa-place (Mr. W. H. Lees for Mr. J. Sullivan).—Refused.

*Holborn.*—Deviations from the plan certified by the District Surveyor under Section 43 of the London Building Act, 1894, so far as relate to the proposed erection of a block of flats on the site of Nos. 5 and 6, Hunter-street, and No. 8, Handel (late Henrietta) street, Bloomsbury, to rear upon Compton-place (Messrs. Perkins & Co.).—Consent.

*Holborn.*—Deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relate to the proposed rebuilding of the "George" public-house No. 9, Great Queen-street.—(Mr. H. M. Wakley for Mr. R. S. Chaffy).—Consent.

#### Line of Fronts and Width of Way.

*Brixton.*—A three-story building on the south side of Canterbury-road, to abut also upon Pope's-road and Industry-street (Messrs. H. Wakeford & Sons for the London, Gloucester and North Hants Dairy Company, Limited).—Refused.

*Fulham.*—A house with projecting bay window on a site between Jasmine House and Burlington House, New King's-road (Mr. R. Groom for Mr. J. Nichols).—Consent.

*Greenwich.*—A one-story shop erected upon part of the forecourt of No. 15, Bedford-place, Old Dover-road, Blackheath (Mr. J. Annercau).—Refused.

*Kensington.*—A building on the site of No. 91, Ladbroke-road, and part of the grounds belonging thereto, to abut upon Lansdowne-road and Boyne-terrace Mews (Mr. E. K. Purchase).—Refused.

*Paddington, South.*—A one-story addition in front of the coachhouse, &c., at No. 6, Alexander Mews, Westbourne Park (Mr. G. J. Cutts for Mr. H. Bradbury).—Refused.

*Paddington, South.*—A bay window and the enclosure of the open porch in front of No. 1, Marlborough Gate, Bayswater-road, at the corner of Elms Mews (Mr. W. W. Gwyther for the National Provincial Bank of England).—Refused.

*St. George, Hanover-square.*—Iron external fire-escape staircases and balconies in front of the Royal Academy of Music, Tenterden-street (The St. Pancras Ironwork Company, Limited).—Refused.

*Fulham.*—A new building on the north-west side of New King's-road, partly upon the site of Nos. 182 and 184, at less than the prescribed distance from the centre of Fulham-park-gardens (Mr. A. E. Chasemore for Mr. T. Hayes Sheen).—Consent.

*Paddington, North.*—That the application of Mr. F. Matcham for an extension of the periods within which the erection of a theatre on the site of Nos. 212, 214, 216, 218, and 220, Harrow-road, was required to be commenced and completed, be granted, upon condition that the theatre referred to be commenced within twelve months and completed within two years from February 28, 1898.—Agreed.

*Strand.*—A new building on the site of No. 32, Foubert's-place, Regent-street, St. James's (Messrs. Goodwyn & Sons for Mr. W. G. Craven).—Consent.

*Bermidsey.*—The frontage of a one-story addition proposed to be erected upon part of the forecourt of the Grange public-house, No. 104, Grange-road, and the erection of additions at the rear of that building (Mr. B. J. Capell for Messrs. Truman, Hanbury, Buxton, & Co., Limited).—Refused.

*Fulham.*—Shops and residential flats on the north side of Dawes-road, between Wexley-avenue and Estcourt-road (Mr. D. Matthews for Mr. F. Batty).—Refused.

*Peckham.*—Rebuilding of the "Grace Darling" beerhouse, No. 57, Green-hundred-road, to abut also upon Trimby-street (Mr. W. G. Ingram for Messrs. Woodbridge & Co.).—Refused.

#### Formation of Streets.

*Clepham.*—That an order be issued to Messrs. Weatherall & Green sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of Abbeville-road into Crescent-lane. (Mr. C. Tress). That the name Briarwood-road be approved for the new street.—Agreed.

*Deptford.*—That an order be issued to Mr. F. Oxley sanctioning the formation or laying out, for carriage traffic, of a new street to lead out of the north side of Nynhead-street, Woodpecker-road, and the formation of a short street, 40 ft. wide, in continuation of the footway next the London, Brighton, and South Coast Railway. That the name Cottesbrook-street be approved for the new street shown upon the plan as to lead out of Nynhead-street.—Agreed.

*Deptford.*—That, subject to the applicants satisfying the Council's Solicitor that their respective clients have full control over land at the junction of St. Asaph-road with Ivydale-road sufficient for the formation, at that point, of a road 40 ft. wide, an order be issued to Mr. A. H. Kersey and to Mr. H. Stock sanctioning the formation or laying out, for carriage traffic, of a new street on the Hogarth estate and the Haberdashers' Company's estate near Brockley Station. (Mr. R. Kersey and the Worshipful Company of Haberdashers.) That the names Arica-road (in continuation), Horsted-road (in continuation), Revelon-road, Finland-street, Dundalk-street, Donyland-street, Avignon-road, St. Asaph-road, and Aspinall-road be approved for the new streets.—Agreed.

*Woolwich.*—That an order be issued to Mr. A. Dwyer sanctioning the formation or laying out of new streets, for carriage traffic, to lead out of Swingate-lane and Timbercroft-lane, Plumstead Common (for Mr. H. N. Grenside and the Rev. J. McAllister). That the names Timbercroft-lane (in continuation), Flaxton-road, Melling-street, Malton-street, Kirham-street, and Pedlar-street be approved for the new streets.—Agreed.

*Wandsworth.*—That the Council do not approve of a variation from a sectional drawing, sanctioned on December 14, 1897, of the gradients of certain proposed new streets on St. Ann's Vicarage Estate, to lead out of The Grove and St. Ann's Hill so far as relates to a proposed alteration of the gradients of Marcus-street and certain parts of Denton-street (Mr. G. E. Withers for Messrs. E. Withers & Son).—Agreed.

*Wandsworth.*—That an order be issued to Messrs. G. Elkington & Son, refusing to sanction the formation or laying out, for carriage traffic, of new streets to lead out of Putney Park-lane and Marlborough-road (for Mr. H. M. Koye).—Agreed.

*Clepham.*—That an order be issued to Messrs. Douglas Young & Co., sanctioning the formation or laying out of a new street for carriage traffic to lead out of Poynder's-road into Deauville-road (for the United Realisation Company, Limited). That the name Rodenhurst-road be approved for the new street.—Agreed.

*Dulwich.*—That an order be issued to Mr. C. Barry, sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of Woodward-road into Court-lane. That the name Eynella-road be approved for the new street.—Agreed.

*Hampstead.*—That an order be issued to Mr. C. J. Bentley, sanctioning the formation or laying out of new streets, for carriage traffic, out of the south-east side of Belsize-avenue, Haverstock Hill (for Mr. R. B. Wood). That the names Gorleston-road and Elsburg-street be approved for the new streets.—Agreed.

*Hammersmith.*—That an order be issued to Mr. J. H. Hayes, sanctioning the formation or laying out of a new street, for carriage traffic, to lead out of the north side of King-street West. That the name Hamlet-gardens be approved for the new street.—Agreed.

*Lewisham.*—That an order be issued to Mr. R. Howell, sanctioning the formation or laying out of two new streets, for carriage traffic, to lead out of the east side of Laleham-road, Catford. That the names Davenport-road (in continuation) and Farley-road (in continuation) be approved for the new streets.—Agreed.

*Wandsworth.*—That an order be issued to Messrs. Rawlings & Son, sanctioning the formation or laying out of new streets for carriage traffic on the Wandale Estate on the west side of Garratt-lane (for Mr. W. F. Palmer). That the names Furnage-street, Twilley-street, and Esparto-street be approved for the new streets.—Agreed.

*Woolwich.*—That an order be issued to Mr. G. B. Arnold, sanctioning the formation or laying out of two new streets for carriage traffic out of Kashgar-road and Benares-road, High-street, Plumstead, and in connection therewith the widening of a portion of St. Nicholas-road. That the names Ceres-road (in continuation) and St. Nicholas-road (in continuation) be approved for the new streets.—Agreed.

*Greenwich.*—That an order be issued to Mr. L. Etheridge refusing to sanction the formation or laying out of new streets, for carriage traffic, to lead out of Woolwich Lower-road, eastward of the South Eastern Railway (Angerstein's branch).—Agreed.

*Kensington, South.*—That an order be issued to Messrs. Chesterton & Sons, refusing to sanction the formation or laying out of new streets, for carriage traffic, on the grounds of a house known as Moray Lodge, Campden Hill (for the trustees of the late Captain W. B. Phillimore).—Agreed.

*Wandsworth.*—That an order be issued to Mr. A. G. Hastlue, refusing to sanction the formation or laying out of new streets, for carriage traffic, to lead out of the north side of Lower Richmond-road and the west side of Ashlone-road, Putney (for Mr. C. Coward).—Agreed.

*Wandsworth.*—That an order be issued to Mr. W. H. Collier, refusing to sanction the formation or laying out of new streets, for carriage traffic, on the Dunsford Park estate, Merton-road.—Agreed.

*Fulham.*—A variation from the plan and particulars sanctioned on December 21, 1897, for the formation or laying out of Bronsart-road, on the Elliott's Trust Estate, Fulham, so far as relates to a proposed alteration in the outlet from that road into Kingwood-road (Messrs. Boyton, Pegram, & Buckmaster).—Consent.

*Lewisham.*—A deviation from the plan and particulars sanctioned by it on January 25, 1898, for the formation or laying-out of a new street named Undercliff-road, on the Hilly Fields-park Estate, Lewisham, so far as relates to a proposed alteration in the southern end of that road (Mr. W. H. Collier).—Consent.

*Lewisham.*—That an order be issued to Mr. M. J. Jarvis, sanctioning the formation or laying-out of a new street for carriage traffic, to lead from Colfe-road into Vestris-road, Forest Hill. That the name Trevisio-road be approved for the new street.—Agreed.

*Wandsworth.*—That an order be issued to Messrs. Glaser & Sons, sanctioning the formation or laying-out of new streets for carriage traffic, to lead out of Balvernie-grove, Merton-road, Wandsworth (for Mr. A. Halford). That the names Smeaton-road (in continuation), Longfield-street (in continuation), and Lainson-street be approved for the new streets.—Agreed.

*Woolwich.*—That an order be issued to Messrs. Farebrother, Ellis, & Co., sanctioning the formation or laying out of a new street for carriage traffic, to lead from Siemens-road into Bowater-road (for trustees of the Bowater Estate). That the name Yateley-street be approved for the new street.—Agreed.

*Lewisham.*—That an order be issued to Messrs. Johnson & Aldridge, refusing to sanction the formation or laying out of new streets for carriage traffic, 40 ft. wide, on the Manor Park Estate, Manor Park, Lewisham and Lee.—Agreed.

#### Space at Rear.

*Dulwich.*—A modification of the provisions of Section 41 (vi.) of the London Building Act, 1894, with regard to open spaces about buildings, so far as relates to the proposed erection of a dwelling-house on the east side of Craigallion-gardens, Denmark-hill, with an irregular space at the rear (Mr. R. D. Hanson for Mr. J. R. Ward).—Consent.

*Whitechapel.*—A two-story workshop at No. 4A, Church-lane, Commercial-road (Mr. A. Parnacott for Mr. W. Nay).—Consent.

*Holborn.*—That the Council do, in the exercise of its powers under Section 41 (vi.) of the London Building Act, 1894, allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a block of residential flats, with shops, on the site of No. 114, High Holborn, and premises abutting upon Southampton-row, with an irregular space at the rear (Mr. A. Keen for Messrs. Keen).—Agreed.

*St. Pancras, North.*—That the Council, in the exercise of its powers under Section 41 (iv.) of the London Building Act, 1894, do not permit the erection of a building not exceeding 30 ft. in height on part of the open space at the rear of a block of residential flats on the west side of Pond-square, Highgate, at the corner of South-grove (Mr. L. V. Hunt for Mr. A. G. Shearing).—Agreed.

*Whitechapel.*—That the Council, in the exercise of its powers under Section 41 (vi.) of the London Building Act, 1894, do not allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of two dwelling houses, Nos. 14, Colchester-street, and No. 19, Church-lane, Commercial-road, with factories on the ground floor and irregular spaces at the rear (Mr. A. C. Payne for Mr. J. King).—Agreed.

#### Line of Fronts and Construction of Buildings.

*Hackney, Central.*—A brick, iron, and wood glass-factory on a piece of land on the eastern side of



Hartwell-street, Dalston, adjoining the North London Railway (Mr. G. W. Rowley for Messrs. Lewis & Towers).—Consent.

**Rotherhithe.**—An iron gangway across Bermondsey-wall to connect the Montreal granaries on each side of the street (Messrs. W. A. Crips & Sons for Messrs. Dudin & Sons).—Consent.

**Dukewich.**—Frontage and construction of a temporary wooden serving-bar erected on part of the forecourt of the "Walmer Castle" tavern, Peckham-road, Camberwell (Messrs. J. & W. Taylor).—Refused.

#### Width of Way and Deviations from Certified Plan.

**Strand.**—That consent be given, under Section 13 of the London Building Act, 1894, to the rebuilding of the "Green Dragon" public-house, No. 38, King-street, Regent-street, St. James's, and that sanction be given to certain deviations from the plans certified by the District Surveyor under Section 43 of that Act, so far as relate to the proposed rebuilding of the public-house (Mr. E. E. Niblett for Mr. A. J. Langton).—Agreed.

#### Means of Escape from the Top of High Buildings.

**Strand.**—That Mr. G. D. Martin be informed that the Council, in the exercise of its powers under Section 63 of the London Building Act, 1894, is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth floor of the Marlborough Hotel, Bury-street, St. James's, at the corner of Ryder-street (for Mr. J. Ramsay).—Agreed.

#### Height of Buildings.

**City of London.**—A building on the south side of Fenchurch-street flanking on a proposed new street, named Lloyd's-avenue, between Fenchurch-street and Crutched-friars, with the flank exceeding in height the width of Lloyd's-avenue (Mr. T. E. Colclutt for Lloyd's Register of British and Foreign Shipping).—Consent.

#### Dwelling Houses on Low-lying Land.—Part XI.

**Greenwich.**—That the solicitor do prepare a licence under Section 122 of the London Building Act, 1894, to Messrs. Graves & Shorter, for the erection of nineteen dwelling houses on low-lying land situated on the north-east side of Trundley's-road, Deptford. —Agreed.

#### Width of Way, Line of Fronts and Deviation from Certified Plans.

**St. George, Hanover-square.**—That the Council do, in the exercise of its powers under Sections 13 and 22 of the London Building Act, 1894, consent to the frontage and position proposed to be adopted in the re-building of No. 8, Great Stanhope-street, Park-lane, and that sanction be given to certain deviations from the plans certified by the District Surveyor under Section 43 of that Act, so far as relates to the proposed new building (Mr. W. H. Romaine-Walker for Mr. R. W. Hudson).—Agreed.

**Bermondsey.**—That consent be not given under Sections 13 and 22 of the London Building Act, 1894, to the position and frontage proposed to be adopted in the re-building of the "Royal Fort" public-house, No. 131, Grange-road, at the corner of Fort-passade, and that sanction be not given to certain deviations from the plan certified by the District Surveyor under Section 43 of that Act, so far as relates to the re-building of the premises (Mr. C. H. Plack for Mr. R. Ireland).—Agreed.

#### Line of Fronts and Space at Rear.

**Newington, West.**—That consent be not given to the proposed frontage of six houses with bay windows on the site of Nos. 75, 77, 79, 81, 83, and 85, New-street, and the erection of six houses (four with bay windows) on the site of Nos. 62, 64, 66, and 68 in that street, and that the Council, in the exercise of its powers under Section 41 (1) (vi) of the London Building Act, 1894, do not allow a modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of the house upon the site of No. 85, New-street, with an irregular space at the rear (Messrs. Briant & Son for Mr. A. F. De Laune).—Agreed.

#### Width of Way and Space at Rear.

**Hampstead.**—A block of five-story residential flats with bay windows on the site of Nos. 2, 3, and 4, Church-row and grounds, to abut at the rear on a lane leading from Heath-street, in the position to the line, with open spaces at the rear, and to extend above the diagonal line as directed to be drawn, and also with courts of insufficient width (Mr. G. Sherrin for Mr. G. Paget).—Refused.

#### Width of Way and Construction of Building.

**Strand.**—A wood and iron shed, on a site on the south-west side of Clare Market, to abut upon Holles-street (Mr. R. A. Dalzell for the National Telephone Company, Limited).—Refused.

#### Means of Escape at Top of High Buildings.

**Strand.**—That Messrs. Saville & Martin be informed that the Council, in the exercise of its powers under Section 63 of the London Building

Act, 1894, is not prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of the Hotel de Paris, Leicester-square, St. Martin-in-the-Fields (Mr. R. Baker).—Agreed.

**St. George, Hanover-square.**—That Mr. G. D. Martin be informed that his application on behalf of Mr. T. Brooke-Hitchings, for a certificate by the Council in respect of the means of escape in case of fire, to be provided for the persons dwelling or employed on the fifth and sixth floors of a block of residential flats, with shops on the ground floor, on the west side of Regent-street, on the site of Hanover Chapel, having been further considered, the Council is not prepared to vary the resolution of July 19, 1898.—Agreed.

#### Buildings for the Supply of Electricity.

**Paddington, North.**—That the Council do approve of the plans, dated September 1, 1898, submitted with the application of the Metropolitan Electric Supply Company, Limited, for the construction of an addition to the company's works in Amberley-road, and that the Council do also authorise the erection of such addition.—Agreed.

#### Excess of Cubical Extent.

**Woolwich.**—That, subject to the provisions of Section 76 of the London Building Act, 1894, consent be given to the erection and construction on the south side of Harrington-road, Woolwich, of a building to exceed in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of large dynamos and alternators (Mr. A. Sabine for Messrs. Siemens Brothers & Co., Limited).—Agreed.

*Recommendations marked † are contrary to the views of the Local Authority.*

#### BOOKS RECEIVED.

ROUND TIMBER MEASUREMENT WEIGHT TABLES FOR RAILWAY RATES. By E. A. P. Burt. (William Rider & Son).  
GUIDE TO ROUND TIMBER CURING RULE. By E. A. P. Burt. (William Rider & Son).  
ELEMENTARY TREATISE ON LAND AND ENGINEERING SURVEYING. By T. Baker, C.E., and F. E. Dixon, C.E. (Crosby Lockwood & Co.).  
KING RENÉ'S HONEYMOON CABINET. By John P. Seddon, Architect. (B. T. Batsford).

### Correspondence.

#### To the Editor of THE BUILDER.

##### "THE SCARCITY OF WATER."

SIR,—I have somewhere seen a calculation that we might pay off the National Debt if for a term of ten years we would turn to account the riches wasted in the sewage of our towns and villages; I have not yet heard of any practical contrivance for this desirable end, and I fear that the same slight obstacle stands in the way of Mr. Guy M. Nicholson's plan for easing the strain on our water companies. As, however, he went to the trouble of writing to you, it is probable that he has one in his head, and I am curious to know what it is. To take the simplest case, that of a suburban detached house, with a garden back and front, occupied by a single family and its servants. He will, I suppose, require the provision of a tank large enough to store its rain water, with pump and necessary fittings, and will impose penalties on any occupier who, by himself or his servants, presumes to use tap water when there is any in the tank. This would require a stringent and well-drawn Act of Parliament, with an army of inspectors to put it in force. But this would be a joke to the difficulty of drafting one to meet the case of Harley-street, not to speak of the miles of weekly tenements in London, or the great rookeries of model lodging houses. The gap between a pious aspiration and a working plan is a long one, and perhaps reforms would be delayed unduly if the first person to notice an evil kept silence till he could show other people plainly how to remove it. R. T.

#### WARNING TO ARCHITECTS.

SIR,—I have been informed that a gentleman has been visiting architects with a view to collecting subscriptions for a new publication entitled "The Practical Decorator," which he states is being produced under the auspices of the Architectural Association.

I know nothing of the publication referred to, and the statement is false.

E. HOWLEY SIM,

Hon. Sec. The Architectural Association.  
56, Great Marlborough-street, W.,  
October 12, 1898.

BOYS' BRIGADE HALL, ST. ANDREWS.—Plans for this hall, by Messrs. Gillespie & Scott, architects, have been approved.

## The Student's Column.

### SOUND, LIGHT, AND HEAT.—XVI.

#### LIGHT : PRELIMINARY.

**T**HE science of light is especially interesting to the architect from the following points of view:—

1. In regard to disputes in "ancient light" cases, not from a legal aspect, but as to how far former light has been interfered with by the erection of walls which are claimed to shut out a certain proportion of light. Also, in giving evidence in such cases on such points as the effects of erecting reflectors, covering opposing surfaces with white tiles or white-faced enamelled bricks.
2. The natural lighting of an interior being bad, to know something of the science of optics, so that the most may be made of both reflection and refraction by prisms and other devices.
3. Reflection of artificial light from surfaces of the walls of interiors; and the increasing and modification of artificial light by various processes.
4. The effect of light on certain kinds of colours used in decoration.
5. The dispersion of light by decomposition; principles of the spectroscopy; chromatic aberration, and kindred phenomena.
6. To the engineer: the optics of lighthouse lenses and their practical application.
7. The polarisation of light, its uses; photographic printing, &c.

Before entering into detail on the various practical applications of the science of light, it will be well for us to enquire what light is. As in many other fundamental problems in physics, there is considerable divergence of opinion in regard to the theory of light. We can describe very many of the effects of light, we can argue negatively about it, we can show that without light such and such a phenomenon is impossible; we can capture it, decompose it, analyse it optically, chemically, and in other ways; and whilst we know so much about it we cannot say what it really is.

In current text-books we are told that light is the agent which, by its action on the retina, excites in us the sensation of vision. That, however, is but a partial explanation, and must certainly be largely modified and qualified. To anticipate, it is only necessary to recall the now well-known Röntgen rays, and researches made in recent years on both sides of the visible spectrum. Rays may here be obtained which, without some considerable assistance, are not visible, and do not excite in us "the sensation of vision." We are sometimes apt to forget that the human being's eye is certainly more limited than the eyes of some other animals, in regard to the power of vision, which latter is, after all, only a matter of degree. We have, therefore, to deal practically with "light rays" other than those directly visible to us. And now we have found out that a so-called beam of light is made up of many other elements than actual light rays. For years we have designed traps for catching these latter and making the most of them; the physicist of the future will, probably, be more concerned in making hitherto non-visible rays visible, for which purpose he will capture those portions of the beam of light which have heretofore escaped by neglect. Here we have opened to us a possible means of vastly increasing the intensity of both natural and artificial light, a tempting subject to which we must refer later on.

Amongst the various hypotheses put forward to account for light, two claim most attention—the emission theory and the undulatory theory. The emission theory, according to Ganot, assumes that luminous bodies emit in all directions an imponderable substance, which consists of molecules of an extreme degree of tenuity; these are propagated in right lines with an almost infinite velocity. Penetrating into the eye they act on the retina, and determine the sensation which constitutes vision. The same author states that on the undulatory theory, all bodies, as well as the celestial spaces, are filled by an extremely subtle elastic medium known as luminiferous ether. The luminosity of a body is due to an infinitely rapid vibratory motion of its molecules, which, when communicated to the ether, is propagated in all directions in the form of spherical waves, and this vibratory motion, being thus transmitted to the retina, calls forth the sensation of vision. The vibrations of the ether take place not in the direc-



The new King V. H. VIII. Grammar School and the County Intermediate School for Girls have just been opened. The County Intermediate School for Girls is situated on a site in Stanhope Park, and was erected at a cost of about 1,700*l*. Accommodation is provided for about seventy scholars, but the buildings were planned in view of future extension. Mr. E. A. Johnson, of Abergavenny and Merthyr, was the architect; his design being



selected out of fifteen others submitted in open competition. The work was carried out under his supervision by Messrs. Morgan & Evans, Pontypool. The new Grammar School occupies a site near the town and railway stations. The new buildings have been erected at an outlay of about 5,000l. The school will accommodate about 120 scholars, and it consists of a large lecture hall and four class-rooms in connexion therewith, one being fitted up as a chemical laboratory. Future extension is provided in the plan for about 100 more scholars and a master's house. Mr. Johnson and Messrs. Morgan & Evans also carried out this work.

**HOME, MANNINGHAM, YORKSHIRE.**—The new building which has been presented to the Committee of the St. Catherine's Home for Cancer and Incurables was opened on the 1st inst. It is situated in St. Mary's-road, Manningham. The home, which has been constructed from designs prepared by Mr. James Ledingham, architect, is built of local stone, and the exterior is in a modified Queen Anne style. The accommodation provided consists of five wards, of varying size, and a day-room, and there are beds for twenty-four patients. There are also two rooms for the matron, and suitable provision for the nursing and domestic staff. The patients may be removed from the ground floor by means of a passenger lift, and a small lift is also available for bringing meals from the cooking department. The basement includes a laundry suite, comprising a wash-house and laundry, fitted with a drying-chamber and a linen-room. The kitchen, scullery, and larder are on the ground floor, with a serving-room adjoining, and this department opens entirely into its own corridor. One apartment is reserved for the purposes of a dispensary. Adjoining the building is a day-room and other outbuildings. The whole of the premises are illuminated with electric light, the current being supplied from the Corporation mains. The building is heated with hot water on the low-pressure system. The floors of the hall, staircase, main corridor, kitchen department, &c., are laid with marble mosaic, and those of the wards and day-room are of maple blocks. The following are the principal contractors:—Messrs. Mason and Jones, John Moulson & Son; plumbers, Wearden & Co.; slater, Thomas Nelson; heating apparatus, Joseph Throp; painters, S. Lupton & Sons; electric light, G. A. Steinhilber; wrought-iron work, Walker & Co.; furnishing, Alfred Speight.

**WATTS, HULL.**—The new East Hull Baths, which have cost close upon 5,000l., are situated midway on the Holderness-road, adjoining the James Reckitt library, they are built on an L-shaped site of nearly 2,000 yds., the arm of the L reaching behind the library. The front elevation is of red brick and terra cotta. The accommodation consists of a swimming bath 90 ft. by 30 ft., with 3 ft. 6 in. to 6 ft. 6 in. water; a boys bath 60 ft. by 30 ft., with 3 ft. 6 in. to 4 ft. 6 in. water; nine ladies' slipper baths (one with immersion bath attached); ten men's first-class baths and twelve men's second-class baths. The large swimming bath has a semi-circular roof of iron and glass. A gallery for spectators runs over the dressing berths, and provision has been made for turning it into a place of public meeting in the winter. The boiler house and laundry stand between the two swims, whilst the bath attendant's face the slipper baths in the central corridor. The slipper baths are arranged in short corridors. The manager's house is over the front part of the building. Glazed bricks are used for partitions and wall lining to shoulder height wherever possible, and the upper part of the walls are faced with an impervious buff brick made by the East Hall Brick Company, Hawarden. Marble mosaic work is used wherever the public have access and also in the bottom of the baths. Electric light is to be the illuminant. The baths were planned by and have been erected under the supervision of the City Engineer, Mr. A. E. White, and the Assistant Engineer, Mr. Bricknell.

**NEW BUILDINGS, ABERDEEN.**—The plans of the following new buildings have been sanctioned:—Two dwelling-houses on the north side of Great Western-road, for Messrs. Storie, Cruden, & Co., advocates, per Mr. John Cameron, architect; two dwelling-houses on the north side of Gilcomston Park, per Mr. George Macdonald, per Messrs. Walker & Duncan, architects; by two houses with shops on the south side of Skene-street at its junction with Rosemount Viaduct, for the Aberdeen Town and County Property Company, Ltd., per Messrs. Brown & Watt, architects; three dwelling-houses on the east side of Rosebery-street, for Mr. John Murray, per Mr. William Ruxton, architect (amended plan); two dwelling-houses with shops on the south side of Union-grove at its junction with Brighton place, for Mr. David Simpson, per Mr. William Ruxton, architect (amended plan); glass-house at the rear of No. 393, Union-street, for Messrs. G. & W. Morgan, per Messrs. M'Robbie & Milne, builders; dwelling-house on the west side of Ord-street, for the Paisley Granite Company, Limited, per Mr. R. G. Wilson, architect; three dwelling-houses on the west side of Blenheim-place, for Mr. John M'Gregor, builder, per Mr. William Beattie, architect.

**PROPOSED HOSPITAL, FOXHALL, BIRSTALL, YORKSHIRE.**—The Oakworth Joint Hospital, which has been constituted of representatives of Birstall, Gomersal, Birkenshaw, and Drighlington, for the purpose of providing accommodation for the isolation and treatment of infectious disease in these

townships, has passed plans, subject to the approval of the Local Government Board, for the erection of hospital buildings at Foxhall, Birstall. The plans, which have been prepared by Mr. J. W. Burrows, architect, of Birstall and Morley, show that the hospital will consist of five blocks—namely, administration block, scarlet fever pavilion, isolation pavilion, typhoid pavilion, and laundry block.

**FACTORY, STAPLE HILL, BRISTOL.**—A new factory for Messrs. Wathen, Gardiner, & Co. is being erected at Staple Hill. It covers an acre of ground, the main building measuring 210 ft. long by 150 ft. wide. Heliwell's patent glazing is being largely used in the skylights. The whole building is heated with hot water. The work has been carried out by Messrs. Cowlin & Son. Messrs. La Trobe & Weston are the architects.

**LIBERAL CLUB, BRIGHAM.**—The memorial stone of a new Liberal Club was laid at Brigham on the 30th ult. The site is on the land side of Bolton-street, nearly opposite the Temperance Hall. The front is to be of red brick, with white brick dressings. The club will be approached by steps, leading a little back from the roadway. The contractors are Messrs. Hogwood & Willis of Brigham. The plans were prepared by Messrs. Bridgman & Bridgman, architects, of Torquay and Paignton.

**MASONIC HALL, DONAGHADEE, BELFAST.**—The foundation-stone of a new Masonic Hall in Donaghadee was laid recently. The entrance porch is on the north side, and a large assembly hall and cloak-room are provided on one side of this porch; whilst on the other side are the lavatory, the store-room, and preparation-room. The building will be of selected red brick, with Grinnock stone dressings to windows, buttresses, and barges. The builder is Mr. Curragh, who is carrying out the work from the plans and under the superintendence of Messrs. J. J. Phillips & Son, architects.

**HOTEL, SELSEY, CHICHESTER.**—A new hotel is to be erected near the sea, on the west side of Selsey Bill, and fronting the New-road. Mr. A. E. Cogswell, Portsmouth, is the architect.

**COTTAGE HOMES FOR CHILDREN, STYAL, CHESHIRE.**—A model village (embracing schools, cottage homes, and hospital) was opened on the 4th inst. at Styal. The buildings have been erected at a cost of 50,000l., by the Chorlton Union Board of Guardians for the accommodation of pauper children. There are a dozen homes, having twenty beds each, and four smaller homes with ten beds each. The internal arrangements of the homes have been specially designed to facilitate the work of foster parents who will have to look after the families. In addition to these homes there is a probationer's lodge, where newcomers will undergo a kind of quarantine for a fortnight before being drafted in the homes. There is also, isolated from the homes, a hospital with all modern conveniences, whilst at the rear of the homes is a block of administrative buildings, including the workshops, laundry, stores, and a swimming bath. Then some distance away is a school capable of accommodating 500 children. The architect of the scheme is Mr. J. B. Broadbent, of Manchester.

**KEKKE CHURCH, GRANGEMOUTH, N.B.**—The memorial stone of this church was laid on the 30th ult. The church is seated for about 750, and is designed in the Gothic style. It consists of a nave and transepts, with a semi-octagonal recess at the west end. It is expected that the building will cost 4,500l. Mr. J. P. Goodair, Falkirk, is the architect.

**CHANCEL SCREEN, BEBINGTON.**—A chancel screen has just been placed in the ancient church at Bebington. It is from the design of Mr. Charles E. Deacon, architect, of Liverpool, and is made of oak. The work has been carried out by Messrs. Harry Hens & Sons, of Exeter.

**NEW HIGH SCHOOL, FALKIRK.**—On the 30th ult. the Marquis of Lorne, K.T., M.P., opened a new high school for the town of Falkirk. The new building has been erected at Parkfoot. The principal features of the main front are three gables. The east and west elevations are similar in style to the front, with gables at either end. The entrances are in these elevations, and are approached by flights of steps, flanked by stone balustrades. In the basement a workshop, for twenty-five pupils, has been provided. The ground floor of the school is occupied by the junior department. The class-rooms, six in number, can be converted into nine by glass sliding partitions. In addition there is cloak-room and lavatory accommodation, besides a private room for the headmaster of the junior department. On this floor there is also situated the gymnasium, as well as the central hall system. On the upper floor of the school are situated the class-rooms of the senior department. Space has been found for art and music rooms by raising the building to three stories in height at both back and front. On this floor are also situated teachers' private rooms, as well as laboratories for the senior pupils. The accommodation of the school is as follows:—junior department, 420; senior department, 515; total of 935. The total cost of the buildings will be about 130,000l., and the architects are Messrs. A. & W. Black, Falkirk.

**TECHNICAL INSTITUTE AND PUBLIC LIBRARY, WEST HAM.**—On Thursday last week the new Technical Institute and Central Free Library, which has been erected by the West Ham Corporation, was opened. The building is planned in the form of a large

quadrangle, with the rooms on the outer face. The larger part of this is occupied by the Institute, which has its principal front and entrance facing Romford-road, one of the main thoroughfares of the borough. This part of the building is designed on two floors, with a basement on the front portion devoted to physical laboratories. The administrative offices and social rooms are placed on the ground floor on the south and principal front, and the various class-rooms and workshops are grouped together, in sections, on the remaining three sides of the quadrangle. The principal room in the building is the large hall, which has a position in the interior of the quadrangle, with its principal entrance from Water-lane. The hall, 80 ft. by 40 ft., accommodates 500 persons. The entrance to this section of the building is on the ground floor, part of the Institute running over it on the first floor. The entrance for the public is defined by the circular tower, and the rooms used by them are grouped near to this entrance. They comprise the general reading-room, 110 ft. by 33 ft.; the reference library, 35 ft. square; the lending department, with a counter 60 ft. long, and the book store, 67 ft. by 40 ft. The design of the exterior is executed in Portland stone and red brick. Some carving has been executed under the supervision of Mr. W. Birnie Rhind, A.R.S.A. This has been introduced in broad masses in various parts of the building. The two gables facing Romford-road represent Fine Arts and Science, and the three to Water-lane Literature, Music, and Engineering. The four figures in the niches in the square towers flanking the main front represent Perseverance, Knowledge, Industry, and Confidence. Two female figures adorn the main entrance, over the centre of which are carved the Corporation Arms. The principal decorations in the interior are in the large hall, the reading-room, and reference library. The ceiling of the large hall is in ornamental fibrous-plaster work, painted in oil, in strong, rich colour, with the walls to correspond. The reading-room has a tile dado, with literary maxims placed at intervals in an ornamental border, and the remainder of this room is decorated with the modelled plaster-work of the sky-light painted. The tympanums at the ends of the sky-light have two panels, modelled and painted by Mr. H. E. Fehr, symbolical of Literature—serious and romantic. The architects were Messrs. Gibson & Russell. The building was illustrated in the *Builder* for October 5, 1895.

**PROPOSED FIRE BRIGADE STATION, DUNDEE.**—It is proposed to erect a new central fire brigade station at Dundee, plans for which have just been prepared by Mr. W. Mackinnon, the Burgh Engineer. The building will occupy the northern portion of the site of the girls' industrial school, Ward-road, and will have a frontage to Court House-square and West Bell-street. The cost is estimated at 6,100l.

**CRAIGIE PUBLIC HALL, PERTH.**—The new Public Hall for Craigie was opened a few days ago. The architect of the hall was Mr. G. P. K. Young. The new building consists of a hall about 50 ft. by 26 ft., entered by a corridor, with ladies' and gentlemen's retiring rooms, and a committee room on the second floor. The hall has accommodation for 300.

**CONSTITUTIONAL CLUB, WILLINGTON QUAY, NORTHUMBERLAND.**—The Marquis of Londonderry opened the new Constitutional Club in Bewick-street, Willington Quay, on the 5th inst. The club has been built from plans prepared by Mr. B. F. Simpson, of Newcastle, and it has been constructed of red brick, with stone dressings.

**PUBLIC OFFICES FOR BUCKLOW UNION, KNUTSFORD.**—Earl Egerton of Tatton opened the new offices built by the Bucklow Union, at Knutsford, on the 5th inst. The buildings are situated at the junction of Buxton-road and Love-lane. The contract for their erection, which was in the hands of Messrs. James Hamilton & Son, Altrincham, was carried out under the supervision of Mr. R. J. McBeath, of Sale.

**LADS' AND MEN'S CLUB, ARDWRICK, LANCASHIRE.**—These premises, which were opened on the 6th inst., are situated in Palmerston-street, Ancoats. The building has been erected by Messrs. K. Neill & Sons, from designs prepared by Messrs. W. & G. Higginbottom, both of Manchester.

**NEW MISSION CHURCH, KIRKLEY.**—The foundation stone of a mission church at Kirkley has just been laid. The church will have a brick base on concrete foundations, and half-timbered walling filled in with brick nogging. The dark oak timbers will show externally and the brick-nogging will be covered with buff rough-cast. The moulded windows will have cusped and carved heads and be filled with tinted cathedral leaded glazing. The roofs will be open-timbered with curved principals and with arcading to form narrow north and south aisles. The bell turret will be arranged over the main entrances. The chancel will be lighted by clearstory windows. The floors will be pick pine wood blocks, laid on Portland cement concrete. It is proposed to re-erect the old wood screen from the parish church under the chancel arch of the new church. A baptistry is arranged at the west end of nave. The contractor for the works is Mr. G. Elsey, of South Lowestoft, and the architects are Messrs. Bottle & Olley, of Great Yarmouth.

**NEW HALL FOR THE EXETER LITERARY SOCIETY.**—The premises of this Society have been considerably enlarged at a cost of about 1,200l. The ac-



commodation now provided consists of a hall 45 ft. by 22 ft., with apsidal end. At the rear is a kitchen. Mr. E. G. Warren was the architect.

**VICTORIA BRANCH LIBRARY, HEATON, NEW-CASTLE-ON-TYNE.**—This building, which has been erected at the expense of Alderman W. H. Stephenson, to commemorate the Queen's Diamond Jubilee, was formally opened on the 6th inst. by the Right Hon. Earl Grey. It is built on similar lines to the Stephenson Branch at Elswick. The accommodation of the ground floor is: large reading and news room, smoking room, and ladies' reading room. On the upper floor is the library, 70 ft. by 36 ft., committee room and janitor's room. The walls of the ground floor story are of rubble stone, snick-faced, and dressed stone to the quoins, windows, and doors; the upper part is all of Penrhaw pressed red bricks and stone mullioned windows. The roof is covered with Madeley Wood brinded tiles. On the roof is a turret, the dome of which is covered with copper. The lighting of the library is by windows commencing at 9 ft. above the floor; externally these windows form gables springing from the roof. This arrangement gives the walls clear all round the room for book shelves, and it is estimated that shelving can be arranged for about 25,000 books. The room is open to the roof, which is all of pitch pine. The remaining joiner work is of canary wood, stained green and varnished. The windows are filled in with lead glassing in clear glass, except the staircase, which is stained glass. In the three gables on the south front are three carved panels, the Royal Arms, the City Arms, and Alderman Stephenson's Arms. In the entrance hall there is a brass plate, framed with red, white, and black marbles, bearing an inscription recording the gift. The heating of the building is by low-pressure steam, and a special system of ventilation arranged by the architect has been adopted. The general contractors have been Messrs. J. & W. Lowry, plumbing by Mr. Mansfield Gibson, tiling by Mr. John Hewitson, lead glazing by Mr. G. J. Baguley, locks and hardware by Mr. N. F. Ramsey, heating by Messrs. Ashwell & Nesbit, electric installation by the Corlett Electrical Engineering Company—all of Newcastle-on-Tyne; and sanitary fittings by Messrs. Doulton & Co., London. The whole of the works has been carried out from the designs and under the superintendence of Mr. John W. Dyson, architect, of Newcastle.

**EXTENSION OF WORKS, LEEDS.**—The extension of works for Messrs. Harding, Richardson, Rhodes, & Co., Limited, have been let to the following firms:—Excavator, bricklayer, and mason, Wade Bros.; terra-cotta work, A. Whitehead; carpenter and joiner, Wm. Nicholson & Son; slater, J. Season; plumber, E. Tatfersall; iron founder, Bagshaw & Son, Batley; painter, T. Heptonstall. The total sum of the contract is 15,462l. The work will be proceeded with immediately, from the plans and under the supervision of Mr. William Bakewell, Leeds.

**NEW LABORATORIES, LIVERPOOL UNIVERSITY.**—The new Physiological and Pathological Laboratories in connexion with Liverpool University College, which have been in progress for two years, were opened on Saturday last week. They form an entire new wing of the building, and are to be called "The Thompson-Yates Laboratories," the entire building and the equipment having been completed at the cost of the Rev. S. A. Thompson-Yates, formerly of Liverpool; now of London. We take the following account of the installation of the laboratories from the Liverpool University College Journal:—"The general outline of the ground plan roughly resembles the letter L, the building consisting of two wings uniting at nearly a right angle. This arrangement secures a much greater amount of window space than would be possible in a rectangular block. There are four stories, including the basement, throughout the building, and three mezzanines adjoining the main staircase, but not extending into the wings. The ground floor is devoted to pathology, one wing being occupied by the classroom for practical morbid histology, which is 50 ft. long and 26 ft. wide, and is fitted up to accommodate about sixty students. It opens directly into the pathological museum. In the other wing is located the room for bacteriology, 53 ft. by 19 ft. Great care has been devoted to the sanitation of this room, and the tops of all the benches are of opaline, so as to obviate all risk of the retention of infective materials. Adjoining this is a spacious suite, including a constant temperature room and rooms for pathological chemistry and for photography. The ample facilities for photography provided in all the departments are a notable feature of the new laboratories; and the same may be said of lantern demonstrations, for which provision is made in a large hall. On the first floor is the large theatre, in which will be used in winter for physiology and in summer for pathology. Here every modern contrivance has been adopted which can help to supply the wants of lecturers and students, a notable feature being a row of "aerial footlights," so arranged that by tilting the beam, which carries them, their light can be thrown either on the lecture table or on the diagrams, or wherever it is required. On the same landing is a large classroom for drum work, where each student is supplied with one of Professor Sherrington's drums and has his own independent motor. Here

We find a large room for physiological chemistry, a chemical balance enclosed in a large dust-proof chamber, a preparation, a research, and an electrical room. On the second floor the large wing is occupied by the practical histology room, the largest apartment in the building, 60 ft. by 40 ft., which is fitted up to accommodate eighty students, and could be made to accommodate several more. Each worker has his own electric light and gas and water supply. There is a small aquarium in this room, and on the same floor are an animal room, a preparation room, and combustion and photographic rooms. The basement contains a cold storage room kept at a constant low temperature by the ammonia process, a laboratory for carrying on the work of the Clinical Investigation Society, and rooms for other kinds of experimental work. An important item is a large, well-lighted students' common room, fitted up so that it can be used for the meetings of the Students' Debating Society. The architect is Mr. Waterhouse, who carried out the other buildings of University College. The Liverpool University College Journal adds that "in respect of completeness and efficiency the Thompson-Yates laboratories are unequalled by any physiological and pathological laboratories in the kingdom"; and we presume that this laudatory appraisal, where it does, is made on the authority of the professors of physiology of the University, who have the data for forming a decisive opinion on that point.

#### SANITARY AND ENGINEERING NEWS.

**WATER SUPPLY, WINSCOMB.**—An inquiry was held in the Assembly Rooms, Winscombe, on the 30th ult., by Mr. H. P. Boulnois, M.Inst.C.E. (Inspector of the Local Government Board), touching an application by the Axbridge Rural District Council for sanction to borrow 3,000l. for works of water supply for the parish of Winscombe. Mr. A. Powell, the Engineer, explained the details of the scheme.

**WATERLOO BRIDGE.**—In consequence of the percolation of the water into the arches carrying the southern approach to Waterloo Bridge, the tops of the arches are being asphalted by the Brunswick Rock Asphalt Co., at a cost of about £10,000. The water caused damage to the goods stored in the vaults, as well as to the brickwork of the arches, which were built with only lime mortar and a protective layer of clay puddle. The spandrels are now being filled up solid to the crowns of the arches, and covered with a layer of asphalt, 1 in. in depth, with a bed of protective concrete 6 in. in thickness. The work, which will take about nine months to finish, is being carried out under the superintendence of Mr. E. Bazalgette, Bridges Engineer to the London County Council.

**NEW DOCK ENTRANCE, SWANSEA.**—At a meeting of the executive committee of the Swansea Harbour Trust recently, six tenders for the proposed new South Dock entrance were opened, and that of Mr. George Nott was accepted at the price of about 80,000l. The lock is to be 350 ft. long and 34 ft. deep.

#### STAINED GLASS AND DECORATION.

**WINDOW, ST. PAUL'S CHURCH, BEDMINSTER.**—On the 1st inst. Archdeacon Roberts unveiled the east window of St. Paul's Church, Bedminster, which has been erected by Sir Edward Hill, K.C.B., M.P., in memory of his father, the late Mr. Charles Hill. The window, which is the work of Messrs. John Hall & Sons, is a tracery one of five openings. The three centre openings represent the crucifixion of Our Lord, and on either side are scenes from the life of the patron saint of the church, St. Paul.

**MEMORIAL WINDOWS, FACEBY, YORKSHIRE.**—A memorial window of three lights at the east end of Faceby-in-Cleveland Church was dedicated and unveiled recently. The window is by Messrs. Clayton & Bell, of London.

#### FOREIGN.

**FRANCE.**—The jury of the competition organised by the "Société Nationale des Architectes," for "Un Pavillon de Repos dans une Exposition Universelle," (as mentioned in our last issue) have awarded the prize to M. Maurice Mallard. An important collection of more than 5,000 coins and medals has been left to the "Bibliothèque Nationale" in the annual extension of the "Société d'Assistance Fraternelle des Architectes Français" has necessitated the creation of two provincial sub-committees: one at Lille, for the north, and the other at Marseilles, for the south-east. Other sub-committees will be formed in other districts of France. A new branch has been opened at Nancy, the architect of which M. Alphonse Richardiere, of Paris, is the architect. A bridge, known as the "Pont de l'île Verte," is in course of construction at Grenoble, with a centre span of 40 metres and side spans of 37 metres each. It is expected to be finished in May next. Some important archaeological restorations and excavations in progress at the Abbaye de Saint-Maur, under the direction of Perle de la Croix. In the cloister court have been found some columns of twelfth century date and a pavement decorated with fleurs-de-lis of the thirteenth century; various inscriptions of some interest, and a sarcophagus of the Merovingian epoch.—The

General Council of Haute Savoie have sanctioned a scheme for the construction of an electric traction railway from Chamounix to the Mer de Glace.—Many of the Paris artists are afraid that the works for the 1900 Exhibition will render the access to the Galerie des Machines, where it is proposed to hold next year's Salon, very difficult for the public, and they are endeavouring to find means to organise next year's Salons in some other locality, which however it will be difficult, if not impossible, to find in Paris.—The death is announced of M. Felix Georges Bernes, Bellocian painter, and son of the well-known military painter of the same name. The young artist, who had obtained a "troisième médaille" in the Salon of 1894, had for some years been a regular exhibitor of portraits and genre pictures.—The death is also announced, at the age of 74, of M. Charles Lhuillier, painter, and Curator of the museum and Director of the Ecole des Beaux-Arts at Havre. He was a pupil of Picot and Ochard, and since 1859 was a frequent exhibitor of portraits, still-life pictures, and landscape, as well as genre pictures and scenes in Algeria.—A church at Thorens, near Annecy, of which M. Fontaine was the architect, has fallen.

#### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Mr. LAZARUS, monumental and architectural sculptor, has removed his works and offices from 29 Hampden Gurney-street to 7 Lanark-place, Clifton-road, Malda Vale, W.

**DEMONSTRATIONS, BRADFORD.**—At their meeting on the 4th inst. the Sanitary Committee of the Bradford Corporation had before them a report from the Medical Officer of Health (Dr. Arnold Evans) in which he recommended that Longlands-street, Longcroft-place, and the streets immediately adjoining should be scheduled as insanitary areas for the purpose of the removal of the refuse. Altogether the population affected numbers about 1,300. The Committee, after a short discussion, decided to adopt the report.

**SOUTH KENSINGTON MUSEUM.**—A drawing of the Arch of Titus at Rome, by the late A. P. Newton, has been presented by his family to the water-colour collection at the Museum, Kensington. Newton was a very fine painter, in his day, of mountain subjects; we have never seen an architectural drawing by him; the fact that this was an unusual subject with the artist gives an added interest to the work.

**CLASSES FOR PHOTOGRAPHY AND PHOTO-ENGRAVING.**—The London Polytechnic (Regent-street) announces a course of instruction in the practice and technique of photography and photographic printing, commencing on the 18th inst.

**WROUGHT IRONWORK.**—At the Manchester City Art Gallery on the 5th inst. Mr. Starkie Gardner delivered a lecture on Wrought Ironwork. The lecturer announced that many of the advances might be architectural students or designers, he had thought it desirable to devote himself to the aspect of the subject more likely to be of interest to them. He only referred briefly to the manipulation of iron, just sufficiently for the purpose of the designer. Iron could be worked cold or hot, but somehow working hot seemed to be considered the more heroic method. Most beautifully wrought iron effects could be got by either method. When hot, qualities were developed which were latent in cold iron. The chief of these was plasticity. When cold it possessed exactly the opposite attribute, being hard, stubborn, and unyielding. In this latter state, however, it might be chipped, filed, or drilled into shape, joined by screws or rivets, planed or polished. The lecturer gave some hints useful in designing for the smith who worked in hot iron, and was therefore compelled to get through his work while the iron kept its high temperature. Turning his attention to ironwork designed as an adjunct to a building or to enclose and dignify an open space, he reminded his audience that the design should always be made to be read at a distance, as soon, almost, as the object came fairly within the range of vision. On nearer approach the subtleties, conceits, and graceful touches should become more apparent, and as the general scheme was lost in close proximity the beauty and value of the details should make itself felt. But this was only possible in high-class work. The progress of design was touched upon. Design, he said, was really a profession needing a most vigorous training, and if the knowledge of the history of a subject was necessary in other professions, it was much more so in design, with its glorious and ancient past. Progress meant not new creations, but additions and improvements to something pre-existing. Mr. Gardner illustrated this point with a series of lantern slides, beginning with the designs of the eleventh century and coming down to modern times. The pictures were illustrative not only of English work but of the contributions to this form of art made by Germany, Spain, and other foreign countries.—Manchester.

**PANEL PICTURES IN THE ROYAL EXCHANGE.**—On Monday the Lord Mayor unveiled two new panel pictures adorning the interior of the Royal Exchange. Before unveiling the first picture the Lord Mayor expressed his pleasure on seeing the inclinations of citizens of London spreading out



towards art, and his hope that the example set in these gifts would be followed until all the panels were filled up. He then drew the curtain and disclosed the painting by Mr. Seymour Lucas, R.A., representing the granting of a charter by William the Conqueror to the Citizens of London. The other picture, painted by Mr. Sigismund Goetze, and representing the offer of the crown to Richard Duke of Gloucester at Baynard's Castle, was presented by Mr. Carl Meyer. The frescoes are 17 ft. 2 in. in height, and 11 ft. 1 in. in width.

**FREE LABOUR CONGRESS.**—The sixth annual Congress of the National Free Labour Association was opened at the Chorlton Town Hall, Manchester, on the 10th inst. About 100 delegates were present, representing, it is said, about 250,000 workmen. Mr. John Chandler, of London, was elected President of the Congress. Mr. W. Collison, the general secretary, submitted the annual report, which stated that 12,000 workmen of all trades and industries had been registered in the books of the Association during the year. Three hundred and twenty employers had made application to the chief and district offices for men, and 13,000 workmen had been sent out, for whom employment had been found. Of these 9,000 were engaged by the large engineering firms of the country during the late season of electric light and free labour bureau for the free registration of non-union workmen had been opened in Manchester, and in four months Mr. Ritson, the Lancashire and Cheshire district secretary, had registered some 2,500 workmen, and found employment for 575 non-union mechanics and labourers. Similar bureaux would be opened in Glasgow, Belfast, and Cardiff. The Association had settled the tramway men's picket in London by sending 350 men in two days to take the vacant places. The President in his address said the Association was not, and it never was, an organisation either to cheapen labour or to go in opposition to those who sought to raise the standard of comfort for themselves and families. It never sent out members to compete in wages with the picket in labour. What it did was to question the right of one section of industry, and that the minority, to form cabals and conspiracies against the majority, that constituted the other section, and to fight in downright earnest against the immorality and injustice of Labour organising itself to tyrannise over Labour. On the motion of Mr. J. T. Craig (Leightonstone), seconded by Mr. G. Ritson, a resolution was passed, urging the need of legislative enactment to define the duties and obligations of trade unions, and to increase their legal responsibilities. Mr. P. McAuliffe (Dublin) moved a resolution pressing for an amendment of the Conspiracy and Protection of Property Act, 1875, by the insertion of the words "and by the means of putting a stop to certain picketing in the City of London (Manchester) seconded Mr. Kilkenny (Hull) supported, and the resolution was carried. Resolutions were also agreed to urging the need of the introduction of a representative of Free Labour into the Labour Department of the Board of Trade, so as to inspire confidence amongst the non-union workmen, and, expressing the opinion that the Workmen's Compensation Act tended to undermine the efficiency and usefulness of mutual insurance societies, penalised employers for accidents over which they had no control; and that any extension of its operations would be detrimental to the interests of both capital and labour. On the following day Mr. Hulst (Warrington) moved the following resolution—"That in the opinion of this Congress the working conditions of non-Union employees connected with the engineering trades are most unsatisfactory, and in many instances such as to create serious and manifest injustice; that this Congress believes the employers know nothing whatever as to these conditions, and urges that a searching investigation should be made in the interest of those employers who desire to secure the liberties and rights of themselves and their workmen." Mr. Baldwin (Manchester) seconded. The resolution was carried. The whole of the officials and Executive Committee were re-elected. The list included Mr. J. Chandler, President; Mr. J. H. Hasted, General Treasurer; Mr. W. Collison, General Secretary; Messrs. P. McAuliffe, J. Penrose, J. Groom, W. Bridgman, T. Courtney, and W. Bailey, Executive Committee.

**STEAM FIRE ENGINES FOR SUNDERLAND.**—The Sunderland authorities recently gave an order for two new steam engines of 4 and 350 gallons capacity. The Watch Committee invited three English makers, Messrs. Merryweather & Sons, Messrs. Rose & Co., and Messrs. Shand, Mason & Co., to submit machines for a competitive test at Sunderland. These engines having been put through various and various tests to test their steam-raising properties, pumping height, and the height to which water could be thrown, the test was decided in favour of the "double vertical" type of Messrs. Shand, Mason & Co., two of which have been acquired for Sunderland.

**ELECTRIC LIGHTING, MIDDLESBROUGH.**—A special meeting of the Electric Lighting Committee of the Middlesbrough Corporation was held on the 5th inst. It was decided to adopt a scheme prepared by Mr. Hammond, electrical engineer, and to apply to the Local Government Board for the sum of 36,000, to be repaid over a period of thirty years.

### CAPITAL AND LABOUR.

**THE LEICESTER BUILDING TRADE.**—A strike in the building trade, which was to have commenced on Monday, has been averted. The Leicester Master Builders' Federation decided to lock out the whole of the carpenters and joiners, owing to a serious rupture and strike which occurred a few days since. The Building Trades' Council threw down the challenge by calling out the whole of the carpenters and joiners employed by a certain builder, on the ground that they were called upon to fix ready-made joinery, which had been prepared either by some foreign firm or some non-unionist house. The result was that the other operatives employed on the same contract came out on strike as well. The Master Builders' Federation therefore announced that unless the strikers returned to work they would serve the requisite notices for a lock-out on Monday. The matter was amicably settled, however, on Saturday. On Friday evening the Secretary of the Master Builders' Federation received a telegram from the representatives of the Amalgamated Society of Carpenters and Joiners at Manchester asking for a suspension of the lock-out notices, which threatened to paralyse the industry throughout the Midlands, explaining that a deputation of the Manchester Executive would arrive on Saturday morning. The lock-out notices, which were then on the point of being posted, were thereupon withheld. The deputation duly arrived, and at once held a conference with the local representatives of the Master Builders' Association. The various points of the dispute were discussed, it being explained that the Manchester Executive had been the cause of the rupture only on the previous evening. The result was that Mr. W. T. Wilson, the Chairman of the Amalgamated Society of Carpenters and Joiners and his colleagues advised the officials of the local branch to instruct the men who had been withdrawn to return to work. As the question of ready-made joinery had been distinctly settled at the recent arbitration, and that it could be fixed by members of the Society, the deputation raised no objection to the employment of non-union men. But as the local Building Trade Council did object to the employment of such men, it was agreed that the question should be settled at a special meeting of the representatives of the Master Builders' Association and the Building Trades Council. At the same time the master builders agree to withdraw the non-union men from the special contract on which they had been engaged and which had given rise to the strike, so long as no objection was made to their employment elsewhere. An agreement embodying these terms was drawn up and signed by Mr. Hardington, the Chairman of the Employers' Society, and Mr. T. Wilson, of the Amalgamated Society, and Mr. Craig, the President of the Leicester branch. Saturday also witnessed the close of the strike on the part of Leicester bricklayers. A contractor had refused to discharge a fellow unionist who was held to have made himself objectionable by carrying out the instructions of his employer and repairing a defect in the work of another trade unionist. On Saturday the strikers announced that the difficulty had been satisfactorily arranged, and that they would return to work.

**STRIKE OF BRICKLAYERS AT WALWORTH.**—A strike of bricklayers has occurred in connexion with the building of the new electric light station for the St. Mary Newington Vestry, at Penrose-street, Walworth. It is stated by the contractor that twenty-six out of thirty-one bricklayers engaged upon the work struck, giving as their reason that one of the men was getting up his corner too quickly. The bricklayer referred to was at one end of the wall, and the other men had to level up to the work performed by him. The contractor further says the men who ceased work demanded the discharge of the workman referred to, and refused to resume work until he was sent away.

### LEGAL.

#### DISPUTE AS TO INTERFERENCE WITH ANCIENT LIGHTS.

THE case of Brown v. Sheinman and Volk came before Mr. Justice Channell, sitting as Vacation Judge, on the 4th inst., on the application of the plaintiff to restrain the defendants by *interim* injunction from the erection of buildings so as to interfere with the plaintiff's ancient lights. Mr. Kenyon Parker, for the plaintiff, said he had read the affidavits which had been filed in the case, and it seemed to him that there was a distinct conflict of evidence as to whether there had been an interference with the light or not. The plaintiff's witnesses said that the light would be seriously interfered with, but on the other hand, the defendants' witnesses said there could not be any possible interference with the light whatever. That being so he (Mr. Parker) asked his lordship to allow the motion to stand till the trial, reserving the question of costs. That seemed to him the most reasonable thing to do.

Counsel for the defendants objected to this course being pursued, and said he would rather, in his clients' interests, that the matter should be gone into and decided one way or the other. It was not right that the defendants should have the possi-

bility of an injunction hanging over their heads for six months.

His Lordship suggested that the better plan would be to advance the hearing and get the case heard earlier.

Mr. Parker said he was willing that the hearing should be expedited, and he would advance the trial as much as he could. He did not wish to take up his Lordship's time by debating what was really the trial of the action.

His lordship said he quite understood that it was not always wise to try these cases on affidavit evidence.

Counsel for the builders, who had also been joined as defendants, pointed out that his clients had no interest whatever in the matter in dispute, and suggested that Mr. Parker, on behalf of the plaintiff, should consent to their names being struck out, and the proceedings being discontinued against them.

Mr. Parker: Yes, I agree to that.

Counsel for the builders: And you will pay my costs?

Mr. Parker: If I get rid of you, I must pay your costs.

His lordship then made an order that the motions should stand till the trial, the plaintiff undertaking to expedite the hearing of the trial.

#### CASE UNDER THE LONDON BUILDING ACT.

AT the Lambeth Police-court, on the 4th inst., Joseph F. Thompson, of Addington-square, Camberwell, appeared to answer an adjourned summons taken out by Mr. E. Marsland, District Surveyor, complaining that in the erection of the top story of some artisans' dwellings at Avenue-road, Camberwell, he used mortar which was not composed in accordance with the by-laws made by the London County Council under the London Building Act. There was a second summons against the defendant for having failed to comply with a notice of irregularity served upon him by the District Surveyor. Mr. Williams appeared in support of the summonses. The complaint of the District Surveyor was that the mortar used was not up to the standard provided by the by-laws; that the top story of the building was not properly bonded and solidly put together; and that the top six courses of the chimney-stack were set in mortar, and not in cement, as required by the Act. It now transpired that during the adjournment there had been some negotiation between the parties, and that the defendant, whilst holding to his contention that the mortar was good, had come to the conclusion that it would be cheaper for him to contest that part of the case.—Mr. Hopkins ordered the defendant to pay a penalty of 25s. and ordered the defendant to pay a penalty of 25s. and ordered the second summons *sine die*, upon the understanding that it would be put in the list again in the event of Mr. Thompson failing to satisfy the requirements of the District Surveyor.—*Morning Advertiser*.

#### CASE UNDER THE LONDON BUILDING ACT.

AT the Clerkenwell Police-court, before Mr. Horace Smith, on the 11th inst., Edwin Nicholas, builder, of London-road, Hackney, was summoned by the District Surveyor of East Islington for rebuilding a bay window without giving notice as required by the London Building Act.

The Surveyor, having given evidence, was cross-examined by the defendant.

Defendant: The bay window is not an external wall of the building, but only an ornamental appendage.

Magistrate: Nonsense, it is a part of the building. The defendant also called his foreman, who gave evidence.

The magistrate imposed a fine of 10s. and 12s. 6d. costs.

#### DISPUTE OVER A PARTY WALL.

THE case of Hobbs, Hart, & Co., Limited, v. Grover was in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 12th inst., for an injunction to restrain the defendant from the alleged interference with a party wall, &c., in the City of London, and for not complying with the London Building Act.

When the case was called on counsel for the plaintiffs said that the defendant desired time to answer affidavits, and that the matter should stand over for a week, it being understood that the defendant should do nothing in the meantime.

His Lordship made an order postponing the motion for a week.

#### DISPUTE AS TO ANCIENT LIGHTS.

THE case of Oppert v. Cochrane and others was again in the list for hearing before Mr. Justice Channell, sitting as Vacation Judge, on the 12th inst., on the application of the plaintiff to restrain the defendants from erecting a building so as to interfere with her (plaintiff's) ancient lights.

After a considerable discussion between counsel appearing for the plaintiff and the several defendants, including the builder, it was arranged that



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Gravels, Gravel, and Hops	Barnet T.D.C.	Council Office	Oct. 17
*Concrete Ball of part of R Quaggy Works	Leisham Board	Town Hall, Colford, S.E.	Oct. 18
*Gravels Korb	Arden C.C.	D. J. Roberts, 242, High-st. Acton, W.	do.
Road Works	Stony Stratford and Wolverton R.D.C.	J. Eussen, C.E., Northampton	do.
Two Houses, Thornton-rd., Morecambe		J. Tansy, Archt. 18, Primrose-st., Morecambe	do.
Farm Buildings, Weston Farm, Newbury, Berks	Sir P. Ruddle	Broadway, Newbury	do.
Schools, Park-st., Mableborough	Rotherham Sch. Bd.	J. R. Knight, Archt. 33, Colliery-st., Rotherham	do.
Public Conveniences	Warrington Corp.	J. Dow, Sankey street, Warrington	do.
Widening "Little" Bridge, Tonbridge	Kent C.C.	County Surv. 88, West-st., Maidstone	do.
Outfall Sewers	Blackpool Corp.	W. J. Hollister, C.E.	Oct. 19
Road Works, Wiltshire	Glam. C.C.	T. M. Franklin, County Offices, Cardiff	do.
Street Works, Mount Ash	Belfast Water Commrs	L. L. Macanay, C.E. Town Hall	do.
Concrete Retainer, Ballygallon		Boro Engr. Court House, Drogheda	do.
Filter Beds, &c., Cavendish-st., Keshigley		W. M. & A. Bagen, Archt. 10, Pitt-st., Ballygallon	do.
*Making-up and Paving Streets	Fulham Vestry	C. R. Botterell, Town Hall, Fulham	do.
*Asphalt Paving	S. George's to the East Vestry	G. A. Wilson, Vestry Hall, Colindale	Oct. 20
*Engine Shed, Gwenton	Midland Ry. Co.	Ca's Archt. Cavendish House, Derby	do.
Brick Sewer, Kildare-road	Glasgow Corp.	J. Lindsay, City Chambers, Glasgow	do.
Additions to Hospital	Huddersfield Union	J. Kirk & Sons, Archt. Huddersfield	do.
Stores, &c., Warwick-road	Batley Co-op. Soc. Ltd.	H. B. Barker, Archt. Old Vicarage, Batley	do.
Parish Hall, Thorp, Abertou		Jenkins & Marr, C.E. 18, Bridge-st., Abertou	do.
Seven Houses, Doncaster-road, Bradford	Newhaven (Sussex) U.D.C.	A. Sharp, Archt. Market-st., Newhaven	do.
Road Works, Lower-avenue, Otford, Essex	J. Drake & Son	F. J. Bayard, C.E. New-baton	Oct. 21
Office, Regent-rd., Morecambe		Northgate, Halifax	do.
Lodge	Carlisle Corp.	Albert-rd. M. R. 10, Carlisle	do.
Additions to School, Guard-street	Wokington Sch. Bd.	H. C. Marks, C.E. 30, Palmer-st., Wokington	do.
Sewers, &c.	Leobury U.D.C.	R. E. W. Berrington, C.E. Wolverhampton	Oct. 22
Messene Hall and Shops, Northgate, Black 173	Cumbe & Co. Ltd.	W. Stirling, Archt. Richmond-terrace, Blackburn	do.
Earthenware Pipes, Overlow, &c., Earthenware	L.D.C.	W. W. Shirley, Town Hall, Earlestown, Lancs.	do.
Laundry &c. Beds College, Durham	Wiltshire C.C.	H. Fowler, Archt. Durham	do.
County Office, Crowbridge		C. S. P. & Sons, City Offices, Crowbridge	Oct. 23
*Making-up Three Streets	Huddersfield U.D.C.	T. S. Smith, Briscoe-rd., Huddersfield	do.
Turning Man	Sogby U.D.C.	D. G. Macdonald, C.E. Sogby	do.
Warehouse, Canal-rd., Bradford		D. G. Macdonald, C.E. Sogby	do.
Purelay Pipe Sewer, Barnston, N.B.	Midlothian C.C.	Belrose & Cairnes, C.E. 1, Belrose	do.
*Underground Sanitary Conveniences	St. Luke (Mid.) Vestry	W. R. Copland, C.E. 118, West Regent-st., Glasgow	Oct. 25
River Pipes	Large (N.B.) Police Commrs	H. E. Stiggle, C.E. Town Hall	do.
Cat Iron Pipe, Marine Parade	Dover T.O.	J. Price, City Hall, Dover	do.
Stabling, Salford Wharf	Birmingham Corp.	Boose	do.
*Underground Conveyance	Hackney Vestry	J. Lovegrove, Town Hall, Hackney	Oct. 26
School, Locking-road	Weston-super-Mare Sch. Bd.	White & Price, Archt. Weston-super-Mare	do.
*Pumping Plant	County Boro. Crofton	Boro. Engr. Town Hall, Crofton	do.

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Cast Iron Pipes, &c. Union-st.	Sligo Harbour Commrs	T. J. Mercer, Town Hall	Oct. 27
Sewers	Tarvis R.D.C.	G. D. Bellamy, C.E. 64, Courtenay-st., Plymouth	do.
Concrete Wall, &c. Langworthy	Brecon C.C.	H. Eger Thomas, Boro. W. Gabbott, Swan-street, Walslow	Oct. 29
Sewerage Works	Walslow U.D.C.	W. H. Radford, C.E. Andover, Salisbury	do.
Well Sinking		H. J. Norris, Bury Meon	Oct. 29
Road Works	Droghda (Hants) R.D.C.	Stoke, Bishop's Walkham	do.
Street Works	Newhaven U.D.C.	F. R. Bayard, C.E. Council Offices, Bournemouth	Oct. 31
Drill Hall, Armoury, &c. Spilby		J. H. Butcher, Archt. Spilby	do.
*Widening Bridges	Middlesex C.C.	R. T. Walsby, City Surv. Guildhall, Westminster	Nov. 1
Twenty-six Cottages, Gordon road, Dartford		E. J. Hammond, Archt. 11, Elm-street, New Brighton	do.
*Public Conveniences	Cromer U.D.C.	A. F. Scott, Council Office, Cromer	Nov. 3
*Sewerage Works	Deal Corp.	Baldwin Latham, 15, Victoria-st., Deal	Nov. 4
*Mason and Iron and Steel Work at Hotel, Edinburgh	Caledonian Ry. Co.	Peddie & Washington, Edinburgh	Nov. 4
House, Wolvenhampton-road, School	Walsley Sch. Bd.	B. J. & McColl, Archt. Bridge-street, Walsley	Nov. 4
Stone Bridge	Carmarthenshire C.C.	County Surv. Shire Hall, Carmarthen	Nov. 14
*Sewage Works	Covenory Corp.	J. Mansergh, 5, Victoria-street, S.W.	Nov. 14
*Baths	Birkenhead Corp.	Hensell & Paterson, Archt. 1, Coleridge-st., Birkenhead	No date
Conventual Home, Fulwood, near St. John's, York	Amble U.D.C.	W. Gibson, Surv. Amble	do.
Making-up Byron-street	Leeds Sch. Bd.	A. Young, Archt. 3, Fiddlers-leigh-avenue, Leeds	do.
School, Bramley		W. B. Braithwaite, Archt. do.	do.
Residence, Holmforth, Yorks	J. P. Floyd	J. Smith, Archt. Huddersfield	do.
Sewering, Keston, &c. Heyham		Walker & Collinson, Archt. Maresfield	do.
Sea Wall, &c. Heyham, Lancs		Lawn & Co. Lancaster	do.
Additions to Ems Hotel, Boro. More	J. & Deckerbury	W. Bakewell, Archt. 28, Park-st., Leeds	do.
Hotel, Oldfield road, Wortley	Breweries, Ltd.	A. Young, Archt. 3, Fiddlers-leigh-avenue, Leeds	do.
Villas, Cheddle Park Estate, Cheddle		R. F. Thompson	do.
House, Arden, Kendal		L. Cherry	do.
Hotel, Oldfield road, Wortley		R. L. Jones	do.
Church, Victoria, Elbow Vale, Mon.		Rev. W. C. Williams	do.
Store, Lees Moor	Dewsbury Flourm.	W. G. Smith, 70, Queen-st., Dewsbury	do.
Nine Houses, Walkley, Sheffield	Indurium, &c.	U. R. Burston, Archt. 6, W. Street, Sheffield	do.
Indurium, &c.		Graham & Graham, Fowey, Cornwall	do.
Mansion		H. E. Dyer, Archt. 1, Sheep-street, Northampton	do.
Primitive Methodist Church and School, Northampton		T. R. McCallum, C.E. 4, Chapel-walk, Manchester	do.
Pumping Machinery, &c. Streetbridge		Keyton U.S.A.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Surveyor's Assistant	Garnon U.D.C.	115 per m. to commence	Oct. 17
*Assistant Surveyor	Southwark Vestry	100 per m. to commence	Oct. 20

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. & xix. Public Appointments, pp. xvi. xvii. & xix.

the motion should stand till the trial, the case to be set down at once without pleadings, the affidavits filed for use on the motion to be available at the trial, with leave to cross-examine the deponents if necessary, and the costs to be reserved till the trial.

## THE BUILDING DISPUTE IN RUPERT-STREET.

COUNSEL on the 12th inst. mentioned to Mr. Justice Channell, sitting as Vacation Judge, the case of Keeble v. Poole, in which his lordship a fortnight ago (reported in the *Builder*) granted an order to pull down part of a building in Rupert-street, W., his lordship suspending the operation of the order for fifteen days, which expired on the 13th inst. The learned counsel stated that his application now was to further suspend the operation of the order for a period of seven days as the parties were now negotiating, and it was hoped they would be able to come to terms.

Mr. Alexander, Q.C., on behalf of the plaintiff, consented to the application standing over for seven days, he undertaking not to enforce the order in the meantime.

His lordship granted the application.

## DAMAGES UNDER THE EMPLOYERS' LIABILITY ACT.

JUDGE LUMLEY SMITH, Q.C., and a jury, in the Westminster County-court a few days ago, heard the action *Broom v. the Army and Navy Stores, Limited*. The action was brought under the Employers' Liability Act by Henry Broom, a builder's labourer, of Clapham, to recover £800 damages for personal injuries sustained while in the defendants' service. The jury found the superintendent and

foreman both negligent, especially the latter, and gave a verdict for the plaintiff for 140l. Judgment was given accordingly, with costs.

## MEETINGS.

SATURDAY, OCTOBER 15.  
Sanitary Inspectors' Association. Annual General Meeting, to be held at Carpenters' Hall, London Wall, 6 p.m.

MONDAY, OCTOBER 17.  
Sanitary Institute (Lectures for Sanitary Officers).—Introductory lecture, by Sir Douglas Galton. 8 p.m.

TUESDAY, OCTOBER 18.  
Northampton Institute, Clerkenwell.—Mr. F. Bond on "Transitional Architecture." 8 p.m.

WEDNESDAY, OCTOBER 19.  
Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Inspection of Disinfecting Apparatus and Model Steam Laundry at St. John's Wharf, Fulham. 3.30 p.m. Dr. Louis Parkes on "Sanitary Laws and Regulations Governing the Metropolis." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Members. 8 p.m.

Edinburgh Architectural Society.—Mr. Percy E. Nobbs on "Wrought Iron." 8 p.m.

THURSDAY, OCTOBER 20.  
Carpenters' Hall, London Wall (Free Lectures on Building and Sanitary Construction).—Professor T. Roger Smith on "Site, Foundations, and Sanitary Requirements."—11. 7.30 p.m.

FRIDAY, OCTOBER 21.  
Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. Manley on "Sanitary Law, English, Scotch, and Irish; General Enactments Public Health Act, 1875; Model By-laws, &c." 8 p.m.

Institute of Junior Engineers (Westminster Palace Hotel).—Presidential Address by Sir W. H. White. 8 p.m.

SATURDAY, OCTOBER 22.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Wimbledon Sewage Works, 3 p.m.

Northern Architectural Association (Newcastle).—Visit to the Guildhall and Sandhill, and Messrs. Robinson's new premises, Clavering-place.

## RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until November 21.

[397]. 21,355.—FOWL HOUSES: A. Harnwell. The house, for open field use, is formed of laths and frame and a corrugated metal roof. Half the length of one side is constructed of wire-netting. The feeding troughs are placed about 1 in. below the edge of the bottom frame so as to be concealed from, and out of the reach of, birds of cattle, the outside of the nests has flaps for ready removal of the eggs, and iron bands at the ends of the house prevent cattle from shifting the wire-netting.

27,476.—SELF-ACTING GATES FOR WATERWAYS: J. E. Whiting.—To improve his Patent 18,928 of 1893 the inventor suspends a cistern by a chain passing over pulleys and having its other end arranged to counteract the action of the counterpoise weight which closes the gates against the water: a pipe conveys water into the cistern as soon as the river or reservoir surface rises to the desired level, so that when the water rises above that level it will flow through the pipe into the tank, and continue to flow until the weight of the tank and the water therein shall suffice to lift the counterpoise weight which keeps the gate closed against the water in the reservoir and thus allow the gate to open until the surface level is so reduced that water will cease to flow through the pipe into the suspended cistern.

27,685.—TILE MANUFACTURE: Mr. DeLoraine. To form an undercut in the tile's back is devised a revolving cutter mounted on a flexible arm attached to a spindle and working above a table. The pressed but unburnt tile is placed on the table, and the cutter is bent down upon it and undercuts the tile as the cutter arm is bent. In another







**LONDON.**—For the erection of the foundations of the *Daily Mail* new premises, Tallis-street, E.C., for Messrs. Hamworth Bros. Mr. Herbert Ellis, architect:—  
 Patrick & Sons ..... £2,754  
 Holloway Bros. .... 2,500  
 Grove & Sons ..... 2,500  
 Kirk & Randall ..... 2,500

**LONDON.**—For the erection of a warehouse, Long-lane, S.E., for Messrs. Boone & Sons. Messrs. Barnes-Williams, Ford, & Griffin, architects:—  
 White & Co. .... £2,242  
 F. & H. P. Buggs ..... 2,200  
 Yerman ..... 2,200  
 Coad ..... 2,200  
 Russell J. Williams ..... 2,200  
 J. Greenwood ..... 2,200

**LONDON.**—For the erection of infants' schools, &c., Cuckoo-lane, Hanwell, for the managers of the Central London School District. Messrs. Newman & Jacques, architects, 9, Farn-court, E.C. Quantities by Messrs. R. L. Lewis & Sons:—  
 W. J. Muddison ..... £5,545  
 Lawrence & Son ..... 5,545  
 Stimpson & Co. .... 6,054  
 Grogan & Son ..... 5,995

**MARGATE.**—For the erection of a house at Law is-crescent, Margate. Mr. T. Wilson, architect, 24, 34, & 54, Farn-court, E.C. Quantities by Messrs. R. L. Lewis & Sons:—  
 Padgett & Sons ..... £4,315  
 Cheam & Sons ..... 4,315  
 Whithead & Co. .... 4,315  
 Brown & Son ..... 4,315

**NEATH (Wales).**—For the erection of retaining walls, for the Coalfranc School Board. Mr. J. Cook Rees, architect, Church-place, Neath:—  
 Thomas Watkins & Co. .... £2,541  
 David Jenkins ..... 2,541  
 Isaac Harris ..... 2,541  
 [Architect's estimate, £415]

**NORWICH.**—For making up, &c., Mousehold, Anchor, Cavalry, Watchhouse streets and Finsbury, Private-street Works. Mr. A. E. Collins, C.E., Guildhall, Norwich. Quantities by Engineer:—  
 B. Glenn ..... £2,366  
 W. A. Read ..... 2,366  
 E. Chase ..... 2,366  
 G. Rickman ..... 2,366

**NOTTINGHAM.**—For the construction of a sewer, Lenton Boulevard, for the City Council. Mr. A. Brown, C.E., Guildhall, Nottingham:—  
 Ford & Hudson ..... £2,732  
 J. F. Price ..... 2,732  
 Winton & Son ..... 2,732  
 Nowell & Sons ..... 2,732  
 F. Evans ..... 2,732  
 Jas. Wright ..... 2,732

**OUNDLE.**—For the erection of the town hall. Mr. J. B. Corby, architect and surveyor, Stamford. Quantities by architect:—  
 J. Gutteridge ..... £2,242  
 J. Woolston ..... 2,242  
 G. Henson ..... 2,242  
 Coates & Son ..... 2,242

**PLAS NANTYR (North Wales).**—Accepted for extending the heating apparatus in the west wing and warming the same from the kitchen fire, for Sir Thomas Storey. Messrs. Harrison, Hall, & Moore, architects:—  
 T. Potterton [No Estimate] ..... £495  
 Addition ..... 60

**ROTHERHAM.**—For additions to warehouses, &c., Rother Works, for Messrs. Kenyon, Son, & Craven. Messrs. Hutchinson & Son, architects, 11, Howard-street, Rotherham:—  
 Jno. Bishop ..... £2,545  
 Wm. Thornton & Son ..... 2,545  
 [All of Rotherham.]

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT,  
 TEAK, VENEER, and TIMBER MERCHANT  
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
 HATTON GARDEN, and 29, RAY STREET,  
 FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
 THICKENING, DRY, AND FIT FOR IMMEDIATE USE.  
 Telephone, No. 774. Hubert. Telex Address: "SNEWIN, London."

**STANES.**—For erecting six cottages, Billest Estate, Stanes for Mr. H. Kent. Mr. J. W. Oades, architect, Egham:—  
 W. Augur ..... £2,732  
 W. Jordan ..... 2,732  
 W. Jackson ..... 2,732

**SWANAGE.**—For the execution of sewerage works in the completion of the main drainage, for the Urban District Council. Messrs. Newman & Cocks, Engineers, 5, St. Thomas-street, Ryde. Quantities by the engineers:—  
 Contract No. 1.  
 T. & J. Binnes ..... £2,898  
 W. L. Meredith ..... 2,898  
 J. T. Whetnam & Sons ..... 2,898

Contract No. 2.  
 W. L. Meredith ..... £3,876  
 T. & J. Binnes ..... 3,876  
 B. Cooke & Co., West-minster (accepted) ..... 4,400  
 H. & J. Hardy ..... 5,500

Contract No. 3.  
 W. L. Meredith ..... £3,876  
 T. & J. Binnes ..... 3,876  
 B. Cooke & Co., West-minster (accepted) ..... 4,400  
 H. & J. Hardy ..... 5,500

**WALTON-ON-THES-NAZ.**—For the execution of road works, Station-road, for the Urban District Council. Mr. H. W. Gladwell, surveyor, High-street, Walton-on-the-Naze. Quantities by the Surveyor:—  
 D. Mackenzie & Son ..... £2,161  
 [Surveyor's estimate, £363]

**WATFORD.**—For making up Liverpool-road, for the Watford Urban District Council. Mr. D. Waterhouse, engineer and surveyor, Newell ..... £734  
 Dupont, Watford (accepted) ..... 613

**WELLINGBOROUGH.**—For the construction of a sewer, New-street, for the Wellingborough Council. Messrs. Sharnam & Archer, architects, Wellingborough:—  
 E. Mitchell ..... £1,719  
 C. & A. Young ..... 1,719  
 W. G. Wilmett ..... 1,719

### TO CORRESPONDENTS.

**NOTE.**—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## J. J. ETRIDGE, Jr.

SLATE MERCHANT,  
 SLATER and TILER.

ESTIMATES GIVEN FOR  
 SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,  
 Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to

BETHNAL GREEN SLATE WORKS,

BETHNAL GREEN, LONDON, E.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 24s. per annum. Remittances payable to DOUGLAS ROUDRINTERS should be addressed to the publishers of "THE BUILDER," No. 4, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## THE BATH STONE FIRMS, Ltd.

BATH.  
 FOR ALL THE PROVED KINDS OF  
 BATH STONE.  
 FLUATE, for Hardening, Waterproofing,  
 and Preserving Building Materials.

## HAM HILL STONE DOULTING STONE.

The Ham Hill and Douling Stone Co.  
 (Incorporating The Ham Hill Stone Co. and C. Traak & Son The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

## SPRAGUE & CO., Ltd.,

LITHOGRAPHERS,  
 Employ a large and efficient Staff especially for Bills of Quantities, &c.

4 & 5, East Harding-st., Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

**METCHAM & SON** (ST. GEORGE'S ST. WESTMINSTER)  
 "QUANTITY SURVEYORS' DIARY AND TABLES"  
 For 1899 will be ready shortly. [ADVT.]

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C.

SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS,

DAMP COURSES, AREAS, ROOFS,

WASHHOUSE AND DAIRY FLOORS, &c., &c.

This Asphalte was chosen to be laid at Sandringham, on the new

General Post Office, and other important buildings.

### TWELVE GOLD AND SILVER MEDALS AWARDED.

# COPPER AND ZINC ROOFING. F. BRABY & CO.

LONDON, LIVERPOOL, GLASGOW, BRISTOL.

352 to 364, Euston-rd., N.W. 6 & 8, Hatton Garden. 47 & 49, St. Enoch-square. Ashton Gate Works, Coronation-rd

## ETHEL MONTAGNE SOLE MANUFACTURING AGENTS.

## NO SOLDER. NO EXTERNAL FASTENINGS.

Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.



# The Builder.

VOL. LXXV. No. 2907.

OCTOBER 22, 1898

## ILLUSTRATIONS.

Design for Processional Cross for St. Paul's Cathedral.—By Mr. Reginald Blomfield .....	Double-Page Ink-Photo.
Competition Design for Colchester Town Hall.—By Mr. Beresford Pite, F.R.I.B.A. ....	Double-Page Photo-Litho.
Church of St. Michael, Llangynydd.—Mr. George E. Halliday, F.R.I.B.A., Architect .....	Single-Page Photo-Litho.
Proposed New Church, Barnoldswick.—Messrs. Brunet & Thorman, Architects .....	Single-Page Photo-Litho.
Hospital of SS. John and Elizabeth, St. John's Wood.—Mr. E. Goldie, Architect .....	Single-Page Tint Block.
The Standard Buildings, Calcutta.—Mr. F. W. Stevens, C.I.E., F.R.I.B.A., Architect .....	Single-Page Tint Block.

## Blocks in Text.

Medals Presented to William and Mary .....	Page 357	Sepulchral Slab, Rand, Lincolnshire .....	Page 360
Bulingham House, in which Sir Isaac Newton died. Pulled down .....	" 359	Church of St. Michael, Llangynydd. Plan .....	" 364
In 1825 .....	" 359	Hospital of SS. John and Elizabeth, St. John's Wood. Plan .....	" 365

## CONTENTS.

Local Government Board Report: 1897-98 .....	357	Competition Design for Colchester Town Hall .....	364	Obituary .....	366
The Church of SS. Anselm and Cecilia .....	357	Church of St. Michael, Llangynydd, Glamorgan .....	364	General Building News .....	367
Notes .....	357	Barnoldswick Church, Yorkshire .....	364	Sanitary and Engineering News .....	368
The Architectural Association Discussion Section .....	359	Hospital of SS. John and Elizabeth, St. John's Wood, N.W. ..	364	Stained Glass and Decoration .....	369
Architectural Societies .....	359	The Standard Buildings, Calcutta .....	364	Foreign .....	369
Sepulchral Slab, Rand, Lincolnshire .....	359	Applications under the 1894 London Building Act .....	365	Miscellaneous .....	369
The London County Council .....	360	Books Received .....	366	Capital and Labour .....	370
Sanitary Inspectors' Association .....	361	"The Scarcity of Water" .....	366	Legal .....	370
Engineering Societies .....	362	Royal Commission on Sewage Treatment .....	366	Meetings .....	371
The Metropolitan Asylums Board and Brook Hospital .....	364	Newcastle Architecture .....	366	Recent Patents .....	371
National Association of Master Painters .....	365	A Model of Stonehenge .....	366	Some Recent Sales of Property .....	372
Processional Cross for St. Paul's, London .....	364	Fire-bricks .....	366	Tenders .....	373

### Local Government Board Report: 1897-98.



THE Annual Reports of the Local Government Board, the twenty-seventh of which has just been issued, though dry enough reading in a literary

sense, form a résumé of the sanitary and social state of the country, a mirror of its progress or the reverse, a repository of ascertained facts in regard to the well-being of the people and the manner in which Municipal and Rural Authorities carry out their functions, which is of the highest importance. The thick blue-book of between 700 and 800 pages goes into a great many subjects—pauperism, local taxation, &c., which it does not come within our province to speak of; but on some portion of its contents we may touch here, though in a necessarily brief and condensed manner.

Under the marginal heading "Constitution and Alteration of County Districts other than Boroughs," we find that during the year eighteen unopposed Orders were confirmed for the constitution of new Urban Districts, of which it is worth while to give the names, as follows: Ashburton, Bracebridge, Buckley, Burnham-on-Crouch, Crook, Great Berkhamstead, Harpenden, Linslade, Llanwrst, Lye and Wollescote, Newport Pagnell, Portslade-by-Sea, Raunds, Rickmansworth, Royston (Herts), Tavistock, Wivenhoe, and Woodhall Spa. The formation of so many new official districts is in itself a good augury of the existence of a desire in various portions of the country to get sanitary and other regulations into operation, since that is one of the most important duties of Urban District Authorities; and though the special reports made from time to time by medical inspectors to the Board show that these duties are often very inadequately carried out, it is at least something that the duty should be incurred and the machinery for carrying it out be brought into existence. By-laws (we regret that the Local Government Board adopts the unauthorised spelling, "Bye-laws") made by four County Councils and three Town Councils under the Highways and Locomotives

Amendment Act (1878) were confirmed during the year; not a large number certainly. One of these was a County Council By-law, under Section 26 of the Act, regulating the erection of gates across highways, and prohibiting gates opening outwards on highways. The special mention of this latter enactment implies that it is somewhat unusual, which ought not to be the case, for such an arrangement is undoubtedly a source of public danger. A certain number of proposals were received from Parish Councils to make by-laws, under Section 8 (1) (d) of the Act, for the regulation of village greens and other open spaces not being recreation grounds or public walks acquired under Section 8 (1) (b). Six series of by-laws of this class have been, after due inquiry, confirmed.

Under the heading of Loans to Rural Authorities it is observed that the greater proportion of the applications for borrowing powers made by such Authorities were in respect of works of sewerage, sewage disposal, and water supply; other purposes included the construction, widening and paving of streets; the erection of offices, public baths and wash-houses, bridges, gasworks, &c.; also electric-lighting apparatus; scavenging, and works for the destruction of refuse. In the majority of cases the powers were not granted till after local inquiry by engineering inspectors.

The appendix gives a tabular statement of the amounts of borrowing powers conferred on various Town and Urban District Councils by Local Acts exercisable without the sanction of the Local Government Board, and the purposes for which the loans have been contracted. Among the largest of these are, Bolton, 290,000*l.* (for tramway purposes); Hull 200,000*l.* (new streets); Leeds 335,000*l.* for purchase of land and drainage works, 320,000*l.* for tramways, and 550,000*l.* for street improvements (it is to be hoped that with these extensive powers Leeds will manage to improve the surroundings of its Town Hall); Leicester, 250,000*l.* for gasworks and 100,000*l.* for waterworks; Liverpool, 620,000*l.* for purchase of tramways; Manchester, 100,000*l.* for supply of water for hydraulic pressure, 110,000*l.* for other waterworks, and 245,000*l.* for general improvements; Nottingham, 300,000*l.* for waterworks, and 153,000*l.* for street improvements, and Sheffield 353,935*l.* for the

same object, and 621,440*l.* for tramways. These figures show that some of our large towns are in a very active state of progress.

Provisional Orders altering and amending local Acts have dealt with very various matters; many of them of the ordinary nature of sanitary regulations and matters akin thereto; one provision deserves notice, that by which the Corporation of Ramsgate were authorised to prohibit by by-law the loading and unloading of wagons and carts in certain streets except at fixed hours; an enactment which suggests a precedent for a good deal of further legislation in regard to the conduct of street traffic in crowded towns. In London and in some of the largest provincial towns, for instance, we have often thought that there should be some effort made to develop the regulation which we believe is in force in some American cities, whereby loaded carts and vans which go at a slow pace are prohibited from the use of the streets between certain specified hours of the day. Such a regulation is certainly very much needed in London, where half the delay to carriages, cabs, and omnibuses during the most crowded portion of the day results from the block caused by slow-moving vans, which sometimes check everything for several hundred yards behind them. It is a point that ought to be considered by the London County Council.

Under the Alkali, &c., Works Regulation Acts no less than 4,116 visits have been made by Mr. Forbes Carpenter, the Inspector under these Acts, with the result that the provisions of the Acts are found to have been very fairly observed on the whole. Two cases were discovered of non-registration of works, and in four cases it was deemed desirable to take proceedings, in three of these because the firms concerned "had failed to use the best practical means for preventing the escape of noxious gases, or for rendering them harmless and inoffensive when discharged." In one of these cases the defendant paid a penalty of 20*l.* without permitting the case to go into court; in the other two a settlement was arrived at on the firms giving a guarantee that the necessary plant should be completed, to the satisfaction of the Inspector, within a limited time.

But the most important portion of the

Report, from our point of view, is that dealing with Metropolitan water supply. The special Report of General Scott, given in the Appendix, in which it occupies thirty-six pages, should be studied in connexion with the portions of the main Report dealing with the same subject. It touches on more points and contains more information than we have space to notice here, but we may draw attention to some special passages. In the main Report we notice that the Lea supply, notwithstanding the bad name which the river bears in regard to pollution, is stated to be chemically superior to that of the Thames, and that except in January, February, and March the Lea water supplied by the New River Company "was substantially of the chemical character of excellent spring water." On the question of storage the Report urges strongly the desirability of providing reservoirs which will obviate the necessity of drawing direct from the Thames either in times of flood, when the water is unusually turbid, or in times of drought, when the flow is unusually restricted. "At the present time, owing to the limited amount of storage accommodation, flood-water has occasionally to be drawn both from the Thames and from the Lea. In such water there is a very large amount of impurity both suspended and in solution." The graphic charts of greatest and least turbidity in the Thames, the Lea, and the New River Cut, appended to Sir E. Frankland's Report, show at a glance the relation between turbidity in the original service and turbidity in the supply as delivered. The highest point of turbidity is in each case reached in February, and throughout the year the ups and downs of turbidity in the source, as shown in the chart lines, are repeated in a nearly parallel course by the lines of the water as supplied, at a lower level of the chart, showing how impossible it is for the most careful system of filtering to cope with the turbidity of rivers in a flood period. In regard to rural water supply a paragraph in the main Report mentions that in consequence of reports which have reached the Board relating to the association of local supplies of water with epidemics of enteric fever in various localities, they had issued a circular letter, in November of last year, to every Sanitary Authority in England and Wales, asking for information as to the nature of the water supply in each district, and especially whether the supply was furnished by a private company or by the Local Authority. Acting on the information received in reply, a further letter was issued in December to every Local Authority giving a public supply of water in a district not within the area of supply of any water company. The letter is given in full in the Appendix; the following is the summary of its general purport:—

"In this letter we drew attention to the responsibility devolving upon the Local Authority of securing to the inhabitants of their district a proper and wholesome supply of water; and we impressed upon them the importance of taking the matter into their serious consideration with the object of guarding their district against the serious dangers which arise from the specific contamination of water delivered from public works of water supply.

We also suggested that, apart from the supply furnished by themselves, the Local Authority should make inquiry as to the sources, nature, and quality of the various supplies in all parts of their district to which their rights of providing a supply extended, and we urged them in every case in which the result of their inquiry was unsatisfactory to take

such steps as might be within their powers with the view of supplementing or improving the existing supplies."

The detailed recommendations given in the letter are excellent, and it is to be hoped that they will be seriously taken up and acted upon by Local Authorities in country districts especially, where (as noted from time to time in our columns) the investigations of the medical inspectors into the circumstances of epidemics in Rural or Urban Districts so often record deficient or unwholesome water supply as among the prominent causes.

Turning to General Scott's special Report on Metropolitan Water Supply, already referred to, and passing over, for want of space, a great deal of valuable information in regard to the proportion of water abstracted from the Thames by different companies, and its relation to the flow of the river, we may observe that it is noted that the statements of the Royal Commission on Water Supply in regard to storage have already borne fruit in the intended construction of large reservoirs at Staines under powers obtained by three of the Metropolitan water companies under the "Staines Reservoirs Act," with the remark that the importance of providing reservoirs applies equally to the Lea.

In regard to the question of intermittent or constant supply, General Scott observes that the intermittent charging of the service pipes favours corrosion, "while the shutting off of the water from the service mains, and their depletion by the gravitation of the water into basement cisterns or by leakage, tend to create a vacuum into which may be drawn either foul air or foul water." The absence of water supply for a fire, without the intervention of a turncock, is of course another evil. While General Scott "charges," generally speaking, in favour of constant supply, he observes that "the weak part in the system, as at present worked, is the surrender of all control of the supply at times of drought, heat, or frost, when there is widespread waste or misuse of water." As to the respective merits of constant or intermittent supply in regard to waste, the evidence seems contradictory. On page 197 we read that the Directors of the Grand Junction Company "are of opinion that the system of constant supply largely increases waste." On page 199 we read that in the case of the Southwark and Vauxhall Company the daily rate of supply for domestic purposes in 1897 was considerably larger in the case of houses intermittently supplied than in those having constant supply, "and that over the whole district of the supply of this company a saving of no inconsiderable amount results from the system of renewed and periodical inspection of fittings, which is incidental to the introduction of constant supply under the Metropolis Water Act of 1871."

In connexion with the same subject, General Scott's Report touches on the question of the retention of cisterns where there is constant supply, in regard to which we are disposed to question his views, as he seems rather disposed to favour the retention of the large cistern which is necessary for the household requirements under intermittent supply. On this head the general weight of medical and sanitary opinion is against him, as it has been found in so many instances that there is difficulty in keeping

these large storage cisterns properly clean; either actual difficulty in doing it (which might be got over no doubt by improvement in placing and construction of cisterns), or difficulty (which is considerable) in persuading or compelling householders to do it. General Scott observes that under the Metropolis Water Act of 1871 the provision of cisterns for the storage of water in houses is "recognised as a feature of the system," by the insertion of clauses requiring such fittings to be attached to them as will prevent waste, but that they are not "prescribed." He adds that generally speaking the water companies, relying on clauses in their private Acts, have insisted on the retention of cisterns, and regard their removal on the introduction of constant service as illegal. If that is the case, it is a point that ought to be inquired into. We feel considerable doubt whether the companies have any legal power to enforce the retention of cisterns where they give constant supply; and such a demand really means that the consumer is offered constant supply but he is to retain a large cistern, with all its sanitary disadvantages, so that the companies may cut off the constant supply whenever it suits them. At all events the large cistern of intermittent supply regime should be done away with; but it is safer to have a small storage cistern, and the best form we know of is that patented by Messrs. Harding & Son, which has already been noticed in our columns.

While on the cistern question we may draw attention to the subject referred to in a letter in our correspondence columns this week, in regard to the waste of rain water and the absence of means of storing it in London houses. We quite agree with our correspondent Mr. Nicholson that it is a serious neglect; and although it will be difficult to enforce the fitting of rain water cisterns to existing London houses, it is a question whether this might not wisely be enforced by a by-law for future houses. In other cases, those whose houses admitted of the fixing of a rain water cistern or (in the case of larger houses) the formation of a rain water tank with pump, would probably find the benefit of it themselves. The point deserves practical consideration.

It may be of interest to give here the estimated daily supply per head of population for last year on the part of each of the London water companies, as appended to General Scott's Report; for reasons which are given the estimate is approximate only, but it is probably fairly near the facts. The figures are those of water supplied "for domestic purposes only"; i.e., not including what is supplied by meter for purposes of trade, &c. :—

	Gallons.
Chelsea Water Company	35.51
East London	26.02
Grand Junction	39.22
Kent	24.17
Lambeth	28.41
New River	24.46
Southwark and Vauxhall	33.38
West Middlesex	27.04

None of these can be regarded as really ample supplies for a city population; they do pretty well for the present, but, as we have before pointed out, they will become less and less adequate as habits of more copious ablution develop, and they cannot therefore be regarded as the measure of future requirements.



THE CHURCH OF SS. ANSELM AND  
CECILIA  
("THE SARDINIAN CHAPEL"), LINCOLN'S-INN-  
FIELDS.

SOME apprehension prevails that this building will come within the area to be taken by the London County Council for laying out their new street from High Holborn to the Strand. With a plain frontage in Sardinia, formerly Duke, street, and abutting against the rear of Nos. 53-4, Lincoln's Inn-fields, it had formed during nearly two hundred years the chief centre of Roman Catholic worship and charity in London. It lost that pre-eminence since the erection of St. Mary's, Moor-fields (opened in 1820), Our Lady's, St. John's Wood (1834), St. George's, Southwark (opened in 1848), and other churches in the course of the current century. On the other hand, it has of late years come into prominence, being largely attended by members of the Bench and Bar, who also, reviving an ancient usage, there celebrate "La Messe Rouge" on the opening of the Courts at the close of the Long Vacation.

As the history of the chapel is but scantily recorded by the customary authorities, including writers of our own time, who appear, indeed, to treat it with a conspiracy of neglect, we have taken some pains to collect a few material facts, in so far as they relate to our own province, for an outline of the story, which may prove of interest at the present juncture.

One interesting, though little explored, side of the church's annals is its association for a long period with the Franciscan Order in England. Nos. 53-4, Lincoln's Inn-fields (west side), now subdivided, were at one time a single house, occupied by the Portuguese and subsequently by the Sardinian Embassies; the house was entered through a door, since blocked up, in Sardinia-street. We gather that the first tenant was Lady Temple, wife (or widow) of Sir Peter Temple. No. 54 is now the Presbytery; it extends over one-half of the archway opening into Sardinia-street, and communicates through the old hall, and a door, with the chapel, which stands just within the boundary of St. Giles-in-the-Fields; in former days that door was the only entrance into the chapel. Above the key-stone of the arch (east side) is a much-worn tablet, inscribed "Dyke Streete, 1648," a similar tablet, with the same inscription, is let into the west wall of the house just above the arch. Duke-street was made on the line of Forue or Fortifeue-lane, leading from Fyckett's-fields through the Purse-field, and so along Fortifeue-garden to the Via de Aldwyche (Drury-lane). The commission to Lord Verulam, Inigo Jones, and others for laying out the Fields was issued in 1618. Inigo Jones completed the houses (Purse-field and Pightells site) on the west side of the square, at first known as Arch or West-row, with the arch or "arches" beneath the present Nos. 54-5. It has been said that the chapel also was built from his designs in 1648; but it is not cited in the classified lists of his genuine or imputed works given in the "Dictionary of Architecture," whilst the chronicles of the Franciscan Fathers point to a date later than 1652, the year of Jones's death. In 1677-86 the Fathers met in chapter at the Royal Friary of Arabida in Denmark (Somerset)

House, under the protection of Henrietta Maria, the "Rose and Lily Queen," whose badges may yet be seen banded on to the Ionic pilasters, since stuccoed over, of Nos. 51-2, and 54, and the three pilasters of No. 2, Portsmouth-street, formerly Louches-buildings. The cognisances commemorate the fact that the land appertained to her jointure; and it was to her that William Newton addressed his petition in 1638 for license to build along the Fields, north side, on the Purse-field and Pightells site. In November, 1687, the Franciscans resolved to acquire "the spot near the arches in Lincoln's Inn-fields lately in the possession of the Countess of Bath." Having gathered funds for the erection of conventual buildings and a chapel, they opened there a noviciate, by name of "Our Holy Father St. Francis," in October, 1688, with a staff of nineteen, and for Vicar, James Ayrey, Chaplain to Pedro Ronquillo, Spanish Ambassador, who then occupied a wing of Weld House, built circa 1630 by Sir Thomas Stradling on the two acres of Aldwyche-close, where are now Wild-court, the Board schools, and Little Wild-street. On the morning of Sunday, November 4, William of Orange passes the Isle of Wight, sailing for Torbay; on that same night the populace attacked the Franciscans' chapel, but were repulsed by a party of soldiers sent by James to protect the Friars. On November 16, the Friars withdrew, at the King's instance, leaving their house and chapel under a military guard. Father Thaddeus quotes a passage from a note written a few years afterwards.

"The London residence house was by the arches in Lincoln's Inn-fields, where there was a very decent chapel, and convenient lodging rooms. But before we had enjoyed it long, the Revolution coming on, it was plundered and gutted by the mob. But three or four years after, being repaired by the Syndic at our cost, was then inhabited by the Portuguese Envoy, till our lease expired; after which we had no more to do with it. By this place 'tis incredible what we lost. Perhaps if I should say upwards of three thousand pounds I should not be much in the wrong."

We may observe, however, that the association of the chapel with the Fathers was resumed, and continued until about fifty years ago.

In the memorable night of Tuesday, December 11, the day of the King's flight from Whitehall, the rabble, ever zealous for plunder and the Protestant cause, besieged some of the ambassadors' houses, and pillaged and burned the King's Printing House, a convent established by James at Clerkenwell, and the chapels in Bucklersbury, Lime-street, and Lincoln's Inn-fields. To William and Mary, on their accession, was presented a medal struck to commemorate the events marked by those acts of outrage and rapine. The medal—which Mr. Grueber's courtesy enables us to illustrate—is a rare one. It is 2.05 in. in diameter, executed in silver by George Bower, who died in or before March, 1690. On the obverse are the busts, draped and conjoined, of William and Mary, as in Bower's similar medal of 1689. The reverse bears the legend, "Nec Lex Est Justior Ulla," above

a beautifully-wrought relief depicting the chapel and house in ruins, with the mob burning the crosses and other Papal emblems in the Fields, and giving a unique view of



Arch-row, the old elevations, the front walls between the piers of the fore-courts, and the railings of the paths and enclosure of the old square.

This chapel and that of the Bavarian Embassy in Warwick-street, Golden-square, were the first to be attacked by the "No Popery" rioters, in the night of Friday, June 2, 1780. The havoc of the Sardinian chapel was repaired by rebuilding and taking in the site of the Embassy stables. The later part of the chapel is designed in a style much plainer than that of the east portion, and has an upper gallery. The east part has an octagonal dome and a lantern, carried by four arches, with a gallery and circular apse. According to some stanzas in the *Universal Magazine* of April, 1781, Rigaud, a pupil of Beaumont, painted the copy of his master's picture above the altar, destroyed by the Gordon rioters—the Marquis de Cordon being then the Sardinian ambassador. The altar-furniture, costing reputedly one thousand guineas, was presented by Charles Albert, King of Sardinia, who died in 1849. The church owns a valuable service of plate; the original plate, given by one Sadler, was saved in 1688, and was bequeathed by his son Philip to the Fathers, who sent it to Douai.

We may add that in this church was baptised Joseph Nollekens, the sculptor, on August 11, 1737; and on August 1, 1793, the day after her Protestant marriage at Mickleham parish church, as she records in her diary, Fanny Burney was married.

BUST OF MR. JACOB BRIGHT, MANCHESTER.—At a special meeting of the Town Hall Committee of the Manchester Corporation, it was decided to accept the offer of a bust of Mr. Jacob Bright. The work will be from the studio of Mr. Onslow Ford, and will be placed in the Town Hall.

\* "The Franciscans in England, A.D. 1600-1850, being an Authentic Account of the Second English Province of Friars Minor." By the Rev. Father Thaddeus, O.S.F. 1897. Vide also "Collectanea Anglo-Minoritica; or a Collection of the Antiquities of the English Franciscans or Friars Minors, commonly call'd Grey Friars, &c. By A[thony] P[arkinson]," 1726.

## NOTES.

**The Brook Hospital Expenditure.**  
THE Local Government Board inquiry in regard to the large excess of expenditure over estimates in the case of Brook Hospital, of which a condensed report is given on another page, is now concluded, though the Inspector, Mr. W. E. Knollys, has not yet sent in his Report to the Board. It appears to us that rather too much is being made of the matter in the daily papers—calling it the "Brook Hospital Scandal" and so on. Such a term is only applicable to reckless and needless expenditure, and we see no evidence that there has been such. Mr. Aldwinckle is one of the most competent architects of the day in reference to this class of building, and we do not believe that any of the extra expenditure has been such as was not necessary for making the building all that it ought to be in regard to structural and sanitary conditions. The extra expenditure appears to have mainly arisen from circumstances which were discovered in the course of the work—in regard to the foundations at all events this was evidently the case—and which were partly rendered necessary by the change of site enforced by the Local Government Board themselves. Where we think the architect did make a mistake was in not keeping the Committee regularly informed as to the necessity and the extent of the increased expenditure. In dealing with public money a Committee ought to be kept informed, from time to time, of all extra expenditure which appears necessary to the architect, so that they may inquire into and check it at the time. If Mr. Aldwinckle had done this we do not think, as far as we can gather from the evidence at the inquiry, that there would have been anything to complain of. He committed an error of judgment in not doing so; but we do not see that it amounts to more than that.

**The Paris Strike.**  
THE strike among certain classes of workmen at Paris, which put a stop for the time to many large operations and threatened to interfere seriously with the work for the 1900 Exhibition, has been fortunately terminated this week, and the operations for the formation of the Metropolitan Railway as well as for the exhibition are in full activity again. The workmen seem to have recognised that the golden visions held out before them by the "Syndicats" are a delusion, and have returned to a common-sense position.

**The Great Central Railway Accident.**  
THIS year will have a very bad record for railway fatalities, and the unfortunate Sheffield line will apparently once more be in the unenviable position of heading the death roll. There is but little satisfaction to be derived from the contradiction of the first report as to the cause of this latest disaster. It was stated that some timber was so loaded as to project and foul the ill-fated train, but this is now officially denied, and the accident attributed to the trucks leaving the metals during shunting operations. It seemed certainly inconceivable that a load of timber should have been so badly adjusted as to project in the manner described. This work is of such a risky and difficult nature, that most of the railway companies have their own staff of timber-

loaders—specialists, in fact; no one else being permitted to attempt it. It is the old tale of shunting being performed within a few feet of the main line, while an express is passing, and of trucks leaving the metals; and, while the timber-loaders are exonerated, the company will hardly be held blameless. It may not be so easy in practice as in theory for all shunting operations to be entirely suspended while expresses are passing, but something in this direction is imperative where there is any risk of such a frightful catastrophe as that of Monday last.

**Kew Bridge (New).**  
TENDERS for rebuilding the bridge were opened last week by the joint committee, appointed *ad hoc*, of the Middlesex and Surrey County Councils. It is stated that the lowest tender exceeds by about 50,000*l.* the estimate prepared by Sir James Wolfe Barry. Two years ago he made plans and designs for a bridge in stone (estimated cost 92,000*l.*) and for one in steel (80,000*l.*). At the monthly meeting on July 23, 1896, of the Middlesex County Council it was agreed, with the concurrence of the Surrey County Council, to adopt the design for a stone bridge and approaches, the retaining walls of the latter to be faced with granite. An Act of Parliament was then obtained for the new works. The cost of a temporary bridge is calculated at 6,000*l.*, but it is expected that amount will be recouped to a large extent by the use of the old stone in the proposed structure, and in other ways. In the meantime the chief anxiety of architects and of all who are interested in the picturesque of the Thames will be to know whether anything is to be done to ensure that the new bridge will be designed in such a manner as to render it an adequate successor to the old one in regard to beauty of design. If the design is to be left to the engineer, there is little chance of this; we shall have an ugly utilitarian structure in place of a beautiful one; and some steps ought to be taken to secure the appointment of an architect, or an architectural committee, to prevent that reach of the river being spoiled by the erection of an ugly structure in place of a picturesque one.

**The California University Competition.**  
As we before stated, under the heading "Competitions," we deferred giving the names of the selected competitors for the Californian University competition until we could be sure of giving them correctly. We have now had the list checked, through the kindness of M. Pascal, the French member of the jury. The correct names are as follows:—

MM. Barbaud & Bauhain (Paris).  
M. E. Bénard (Paris).  
Herr F. Bluntschli (Zurich).  
Messrs. D. Despradelles and Stephen Codman (Boston).  
Herr Rodolphe Dick (Vienna).  
Mr. J. H. Friedlander (New York).  
MM. Heraud & Eichmüller (Paris).  
Messrs. Howard & Cauldwell (New York).  
Messrs. Howells, Stokes, & Hornbostel (New York).  
Messrs. Lord, Hewlett, & Hull (New York).  
Mr. Whitney Warren (New York).

It is worth note that nearly all those whose designs are premiated have been pupils of the Ecole des Beaux-Arts at Paris. Herr Bluntschli (born in 1842 at Zurich) was a pupil of Questel in Paris in 1864. M. Despradelles is a native of Paris, and his

partner Mr. Codman was a pupil of M. Blondel at Paris in 1890. Herr Dick (born at Vienna in 1860) was a pupil of M. Pascal at Paris in 1884. Mr. Friedlander (New York, 1870) was a pupil of M. Esquié at Paris in 1891. Mr. J. E. Howard (New York, 1864) was a pupil of M. Laloux at Paris in 1892. Mr. J. Howells (New York, 1868) was a pupil of M. Godefroy of Paris in 1893, and his partner Mr. Hornbostel was pupil of the same master in 1894. Mr. Warren was, we believe, pupil of MM. Daumet and Girault, of Paris, in 1891. Fourteen of the premiated architects were therefore pupils of the Ecole des Beaux-Arts. This result curiously indicates the French tendencies of the Committee (as the manner of design and get-up of drawings required at the Ecole des Beaux-Arts are generally unmistakable), unless we are to take it as an indication that the French training is really superior to any other in enabling architects to deal with large schemes of design.

**Anglo-Indian Architecture.**  
WE publish this week an illustration from a photograph of a large building recently erected in Calcutta, as a specimen of the work that is being done there; but we fear that we cannot promise those who are interested in the building that it will be regarded by English architects as worth the appreciation it apparently finds in Calcutta. The fact is that the art of architectural design, as understood in England, France, and America, hardly seems to exist in India, owing to the hereditary tradition according to which all architectural work is in the hands of men who, whatever their abilities, have had the education of engineers, not that of artists. The result is what we see illustrated in this case, the production of buildings which, though carried out with the best intentions, have not what would pass for high architectural character in this country. What is really wanted in India is that architecture should be taken out of the hands of the P.W.D. engineers, and that encouragement should be given to young English architects who have had a genuine training in architectural design, to come out to India and carry out in our Indian cities such architecture as would come up to the critical standard of London, Paris, and Boston. There are many able young architects in London, men who are really original artists, for whom there is hardly room here, who might be doing most valuable work in India in improving the architecture of the Presidency capitals. As it is, the architectural work seems to be left to men who, as in the present case, are no doubt admirable constructors, but who appear scarcely to realise what architectural design in the higher sense means, or to distinguish between sculpture, in the artist's sense of the word, and the productions of a stone-carver's emporium.

**Portland Cement Testing.**  
CONSIDERING the great importance in these days, when concrete is so largely used, of getting Portland cement of the best quality, the establishment of a society for the purpose of testing this material, under the title of "The Cement Users' Testing Association," seems likely to be a benefit to engineers and architects, who have often no means at hand of procuring anything but an ordinary tensile strength test, which can hardly be



regarded as sufficient in the case of important works on a large scale. The Association here named, which is just started, propose to offer facilities for efficiently testing Portland cement, whenever required, for (1) Specific gravity, (2) Tensile Test on a large Section, (3) Transverse breaking weight, (4) Fineness, (5) Condition as to heating, and (6) Chemical analysis. It is not, of course, supposed that it is essential to carry out all these tests on every occasion that a sample is taken; but it is urged that, to secure a thoroughly sound material, it is well that the manufacturer should know that his cement may at any moment be subjected to examination in regard to all those points. The Association is opening offices at London and Manchester, and has drawn up a scale of charges.

WE hear that the trustees of the property have relinquished their idea of pulling down this house, and intend to reconstruct it. We see it is stated that the observatory on the roof "disappeared about thirty years ago, a syndicate of Americans having given 100*l.* for it, and taken it away to America for purposes of exhibition." Now, it is very doubtful whether the "observatory" was built by Newton at all. The structure itself was made, it is said, out of some pews from (old) St. Martin's Church, pulled down in 1721. The last use it served was that of a shoemaker's shop. In his "Curiosities of London" (1855) Timbs says it was built by a subsequent tenant, a Frenchman; and Cunningham records that the next inhabitant (after Newton) was Paul Domménique. In the rate-books of St. Anne's, Soho, we find that Mr. Doll is rated at 1*l.* 5*s.* for a house on the west side of the then Leicester Fields, during the latter half of the year 1711. Doll had preceded Newton in the house No. 35, St. Martin's-street, in the parish of St. Martin, whither the latter removed from Chelsea. Newton's name will be found in the St. Martin's rate-books for and after 1711: he paid 2*l.* 10*s.* per half-year for the poor-rate. The major portion of Newton's astronomical work was done before he came to live in London; he did very little during the closing years of his life. Nor did he, as is frequently stated, die in this house. In January, 1724-5, he went to Sir Andrew Pitt's house, Kensington, where he remained almost continuously until his death there on March 20, 1726-7. The house, known as



Bullingham House, in which Sir Isaac Newton died. Pulled down in 1895.

"Bullingham House" was one of two, forming Orbell's-buildings (lately the Kensington Girls' College), pulled down three years ago

for a block of flats in Pitt-street, adjacent to the Carmelite Monastery illustrated in the *Builder*, July 10, 1886.

Sheffield  
Society of  
Architects.

THIS Society promises an excellent though short programme of papers for the coming Session. They are as follows: November 15, Mr. T. Swaffield Brown (Master of the Arts and Crafts Guild) on "Ecclesiastical and Art Metal-work"—rather a doubtful title, by the way, as it seems to imply (what is unfortunately often too true) that "Ecclesiastical metal-work" is not "Art metal-work"; December 13, Mr. Beresford Pite on "Michelangelo's Architecture"; January 10, Mr. F. T. Baggallay on "Common Errors in Design"; February 14, Mr. P. Marshall, F.S.I., on "Surveying"; and March 14, Mr. E. P. Warren on "Theory, Practice, and Tradition." All these are subjects of interest, and the names of the readers of the papers offer the best promise that they will be well treated.

Académie des  
Beaux-Arts.

At the French Académie des Beaux-Arts there is rather a keen competition for the honour of succeeding to the architectural chair left vacant by the death of M. Charles Garnier. Among the names which are spoken of for the election are those of MM. Girault, Guadet, Laloux, Moyaux, Paulin, Rouyer, and Scellier de Gisors; but the general opinion seems to be in favour of M. Guadet. The election takes place on Saturday, the date of this issue.

#### THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION: CHURCH RESTORATION.

The first meeting of the present Session was held at 56, Great Marlborough-street, on the 14th inst., Mr. H. J. Leaning, Chairman of the Section, in the chair. Mr. C. E. Mallows read a paper entitled "Church Restoration." He thought the word "restoration" was a wrong one, for no one, however great, could restore the old work and follow the individuality of the original artist. The misnamed practice had been the cause of the destruction of a great many of our old art treasures of all kinds, and of the historical associations attached to them. Our old churches formed the best text book for the instruction of the young architect. While our friends the painters would no doubt prefer some of our old buildings to wear themselves away to a heap of picturesque ruins, yet there was a middle course between that and practically rebuilding. Every means should be taken to preserve the old work, wherever possible, only making repairs where they are absolutely necessary. The roof should be dealt with in sections, and strengthened by piecing in new work where required; an old thick wall should not be condemned because it may be a few inches out of the perpendicular. Should it be absolutely necessary to do so, it should be repaired from the back, cutting out the old defective parts and putting in new, using slow-setting cement, and endeavouring in every way to preserve the old face work to the greatest extent possible. If the old gravestones and tiles must be dealt with, for the purpose of laying a concrete bed under the floor, they should be lifted one at a time, and carefully arranged and laid side by side exactly as they were in the floor. The earth outside, where above the floor level, should be cut back to a slope, and the trench at the bottom sunk low enough to keep the walls dry, and the whole should be well drained. Wherever new work was required it should be of the most unobtrusive character. The author suggested the appointment of a National Committee for the Preservation of Historical Buildings, the members of which should be selected from amongst the best and most conservative artists in the country. The committee should be endowed with power, absolute and without appeal, to give or withhold sanction for alterations and

repairs. He also suggested that all architects should report all instances of restoration which they may observe to the Society for the Preservation of Ancient Buildings.

Mr. Millard, in opening the discussion, said he did not think such an objection should be taken to the term "restoration." We must not forget that the men of old did not hesitate to alter an old building when necessary, and in so doing made its history. To avoid making alterations was avoiding to write history. The anti-restoration craze was a product of this century. They must allow that the right of altering an old building rested with its owner, and the question was, not whether they should alter but how they should alter. He instanced the restoration of the Westminster Chapter House by Scott, and asked whether any fair-minded man would object to it being restored to what it is now, or whether he would prefer it to have remained an unaltered wreck as it was in the last century. He thought the reproduction of the building as nearly as possible to what it was in the thirteenth century was worth doing. In commenting upon Mr. Mallows' suggestion as to a National Committee, he mentioned that in France the restoration work was carried out under a Government Committee, and the results were execrable.

Mr. Selby proposed a vote of thanks to Mr. Mallows for his paper, which was seconded by Mr. Lanchester. Mr. H. V. Smith concurred with Mr. Millard in considering the question from a common-sense point of view. Many old churches owed their beauty only to accidental circumstances and to the additions made in various styles and periods. Mr. Jemmett thought that the sentimental surroundings of old churches obtained more consideration than the utilitarian question. He would be inclined to pull down all the additions made in the course of time, and try to reproduce the idea of the original designer in its completeness. The discussion was continued by Messrs. W. B. Hopkins, G. Lucas, A. S. Tayler, and H. Rose.

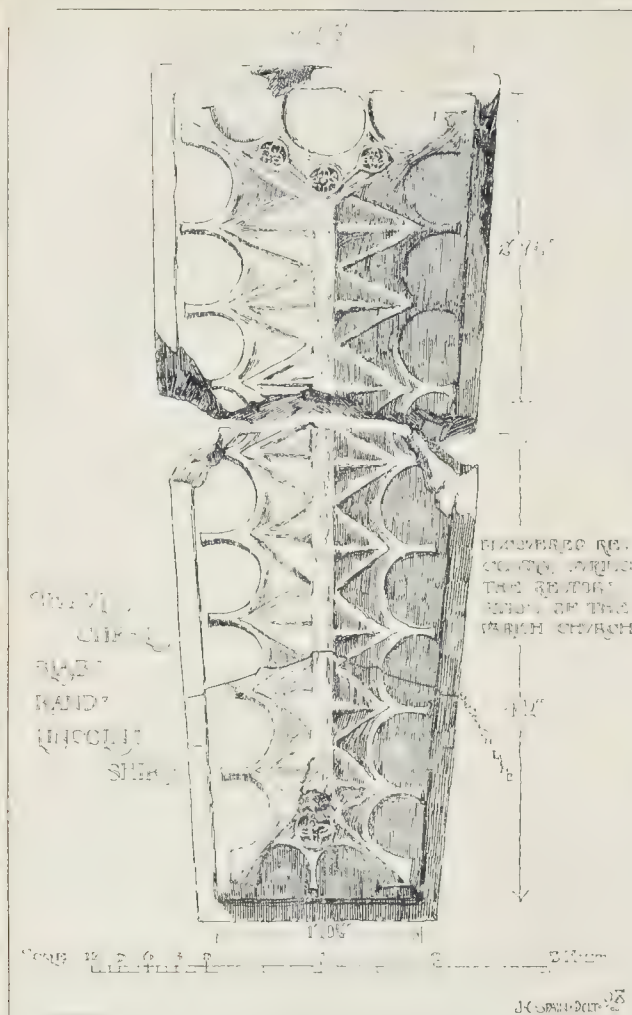
The Chairman, in summing-up the discussion, said he agreed with Mr. Jemmett to a certain extent, and remarked that, in some cases, copying of old work must, of necessity, be resorted to; but a new addition should be treated in a modern spirit.

The vote of thanks was then passed to Mr. Mallows for his paper, after which he briefly replied. The Chairman announced that the next meeting would be held on November 4 when a debate would be opened by Messrs. F. M. Elgood, A. R. Jemmett, and H. V. Lanchester, on "Modern Architectural Tendencies as Illustrated by Contemporary Work."

#### ARCHITECTURAL TENDENCIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—The Sheffield Society of Architects and Surveyors held a dinner at the Wharfedale Hotel on the 8th inst. to inaugurate the new session. The President of the Society, Mr. R. W. Fowler, occupied the chair, and Mr. J. Smith was in the vice-chair. The loyal toast having been honoured, the President proposed "The Lord Mayor and Corporation." Colonel Bingham, in responding, spoke of the improvements noticeable in many ways in the city, and of the growing prosperity of trade, and, referring to the buildings that had been erected in recent years, he said that the city was becoming an attraction, and was in that way gaining by the labours of its architects. Why should not pretty and attractive, if small, houses be put up instead of the ugly buildings which appeared to be, but were not, cheaper? There was no valid or economic or sensible reason why the air of Sheffield should be so continuously permeated with obnoxious smoke. There was every reason why it should not be. With the aid of science and by the exercise of ordinary common-sense Sheffield should have a purer air than London, and at least when the wind was in certain directions it might have the appearance of a big village rather than a sooty city. Mr. H. Sayer (Town Clerk) also replied on behalf of the permanent staff. Dr. Sorby submitted "The City and Trade of Sheffield," and Mr. Douthwaite replied. The Vice-President gave the toast of "The Royal Institute of British Architects." Mr. Innocent, as the senior member present of the Institute, replied, and said he thought the Institute might make itself more useful to the members, and it would be improved by being brought up to date. When the Institute





agreed to affiliate provincial societies Sheffield was the first branch to join. Mr. Hadfield gave "The Visitors," and took the opportunity to refer to the benefits to be derived from improved city surroundings. Mr. W. T. Tasker replied. Mr. Sayer, in submitting "The Sheffield Society of Architects and Surveyors," described it as an eminently useful body, and the President, in response, said the Society had prospered. The membership was 115—the largest number on record. Mr. Innocent had retired from the position of secretary, but they were glad still to have the benefit of his experience. Mr. Fenton had proved a hard-working and energetic successor. The President also referred to the lectures which had been arranged for the session. The final toast was "The President," proposed by Mr. Moss.

#### SEPULCHRAL SLAB, RAND, LINCOLN-SHIRE.

This slab was discovered recently during the restoration of St. Oswald's Church, Rand.

The lower half, measuring 4 ft. 4 in. long, was used, turned upside down, as a threshold for the west door of the tower; the upper, 2 ft. 9½ in. long, as a paving flag in the nave.

The interest of this slab lies chiefly in the uniqueness of the design. As the section shows, the slab is coped with a shallow pitch, the carving being very shallow. Its greatest

thickness is 10 in. The material of which it is made is black marble.

The pattern is distinctly Norman, and the material used as well as the type of carving (shallow and rounded) is of exactly the same character as that of the celebrated Black Marble Font in Lincoln Cathedral. If it were not for the strong Byzantine tincture in the Font I should believe them to be co-eval—if not the work of the same man. The Font, however, is of assured Early Norman date, whereas the ornamentation of the triangular ends of the slab rather point to Late Norman. There is, round the edge of the slab, a sunken ridge of from 2 to 2½ ins. wide, which possibly held a metal strip bearing an inscription, though there are no holes apparent for plugging on such strip. From inquiries made at the British Museum, it appears that, as to design, there is a slab something similar to this at Aycliffe, Durham. From a rough sketch of the Rand slab an authority has suggested late thirteenth century as the date, though he admits that this is but a suggestion, having no conclusive data for fixing it with certainty.

I should be glad to hear of anything analogous, whereby the date might be more accurately fixed.

J. E. SPAIN (Rector).

\* \* \* The design appears to us to be a rude illustration of a nave arcade and vault, seen in a kind of "Mercator's projection."—Ed.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday at the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

**The Widening of Lothbury.**—The Improvements Committee reported:—"We have had before us a letter from the City Corporation, submitting an amended plan showing a suggested widening of the portion of Lothbury between Old Jewry and Princes'-street, and renewing their application for a contribution towards the cost. It will be within the recollection of the Council that on July 25, 1898, we reported upon a proposal of the Corporation to widen Lothbury to 60 ft., and the Council, upon our recommendation, decided not to contribute towards the cost of that improvement, estimated to cost 74,125*l.*, as we were unable to learn that it was the intention of the Corporation to continue the 60 ft. thoroughfare by widening Gresham-street throughout. The amended plan now submitted shows a widening of the road to 50 ft., the estimated cost of the work being only 42,000*l.* The Corporation suggest that the Council, although declining to contribute towards the cost of the larger scheme, might perhaps see its way to admit the necessity of the smaller improvement, and accordingly contribute part of the cost of the 50 ft. widening. The present width varies from 30 ft. to 33 ft., and the proposal is to increase this to 50 ft. by acquiring from the Trustees of the Bank of England land which is at present cleared and is about to be let on building lease. We consider that to widen the road to 50 ft., as now proposed, will constitute a desirable improvement. We are impressed by the fact that the land needed for the widening of the road, although situated in such an important part of the City, can be acquired at so small a cost as 42,000*l.* The opportunity is one which may never occur again, and, after a review of all the circumstances, we feel justified in advising the Council to contribute one-third of the net cost, such contribution not to exceed the sum of 15,000*l.*"

Mr. Benson moved to refer the recommendation back to the committee. He contended that the proposed improvement was of a local character, and was not a metropolitan improvement, and that the whole of the cost should be borne by the City.

Mr. Seagar seconded, but the amendment was rejected, and the recommendation of the Committee was adopted.

**Central School of Arts and Crafts.**—The Technical Education Board submitted the following adjourned report:—

"It is within the knowledge of the Council that two years ago the Technical Education Board established a school of arts and crafts in premises at No. 316, Regent-street and Little Portland-street, which were offered to the Board on a temporary tenancy on very advantageous terms by the governors of the Regent-street Polytechnic. The school was placed under the direction of the Board's art advisers, Mr. George Frampton, A.R.A., and Mr. W. R. Lethaby, and all the teachers appointed were leading men in their respective departments, and were intimately associated with productive work. . . . The subjects taught have included modelling and sculpture, bookbinding in all its branches, architecture, decorative stone work, architectural lead work, stained glass work, silversmiths' work, (including design, making, engraving and chasing), enamelling, cabinet design, and engraving for wood blocks, and as a foundation for this work classes have been conducted in drawing from nature and from the cast. Periodic exhibitions of the work of the students have been held and have met with favourable comments. The number of students has increased so that the capacity of the temporary premises has been severely taxed, there having been 539 individual students in attendance during last winter. Every room in the premises is now fully occupied and there is no room for the further extensions of the work which appear desirable. Moreover, the arrangement with the Polytechnic was to the effect that the Board might occupy the premises for a period of five years from the commencement of the tenancy, at the end of which period they will be required for the purposes of the Polytechnic, in consequence of the falling in of the lease of other premises at present occupied by the women's department. It would therefore, under any circumstances, be necessary for the Board to secure other premises within the next two or three years, and, as it is most important that the school should not be removed to another neighbourhood, the problem of finding accommodation is one of such difficulty that it is undesirable to allow an opportunity to slip. . . . The attention of the Board has been called to a building, known as Oxford-mansions, within a few yards of the existing school, the



lease of which is now in the market. The building forms a square block 70 ft. square, completely surrounded by wide public streets, and lighted on all four sides, and comprises a basement and five other floors, including an available floor area of about 50,000 square feet. The premises are held on lease from the Portland Estate, with fifty-eight years to run, at a ground rent of 500l. per annum. The situation is admirably adapted for the work of the school, and the extent of the premises will meet all the school requirements as far as they can be compassed for a long time to come. An offer of the premises has been received at the sum of 35,500l. subject to the acceptance by the Council in October. This offer was made too late for the last meeting of the Council before the vacation, but the Council's valuer and solicitor have been instructed to make the necessary arrangements for acquiring the lease of Oxford-mansions for a sum not exceeding 35,500l., which is within the estimate made by the Council's valuer, subject to the adoption by the Council of the Board's recommendation. It may be pointed out that the position and character of the premises render them a most desirable property for acquisition by the Council. . . . When the necessary alterations have been made the building will comprise thirty-three rooms, each about 33 ft. square, together with a basement story, a central hall, and a number of smaller rooms for the use of the staff and of small classes. The architect's estimate for the necessary alterations, including the installation of the electric light, amounts to 5,000l.; the cost of these would be defrayed by the Technical Education Board out of the sum of 35,500l. appropriated by the Council on the estimate for the current year. . . . We recommend—That the estimate submitted by the Finance Committee be approved; that the Council do authorise an expenditure not exceeding 35,750l., including stamp duty and other expenses, for the purchase of the leasehold property known as Oxford-mansions; and that the solicitor do carry out the arrangements.

Mr. E. Bond, Chairman of the Board, said he anticipated that there would be considerable opposition to the proposal, as it was proposed to secure the leasehold and not the freehold of the premises. He therefore desired to withdraw the report.

**Covent Garden Theatre.**—The Theatres and Music-halls Committee reported as follows:—

The Council on April 10 last authorised the service of a notice under the Metropolitan Management and Building Acts Amendment Act, 1878, on the owner of Covent Garden Theatre, requiring him to have the scene store under the stage separated from the other parts of the theatre by fire-proof construction to the satisfaction of the Council. The notice was served on May 17, 1898, and the time allowed for compliance with the notice expired on August 17 last. From a recent inspection of the building, it appears that nothing has been done to meet the Council's requirements. We therefore recommend—That the solicitor be instructed to take the necessary proceedings to enforce the penalties to which the owner of Covent Garden Theatre is liable under the above-mentioned Act, and that he be authorised to retain counsel to represent the Council in the case, if necessary.

The recommendation was agreed to.

**Electrical Tramway Traction.**—The Highways Committee reported:—

"We are still of the opinion which we have previously expressed, that the overhead trolley system of electrical traction is unsuitable for the more crowded of the London thoroughfares. As, however, the London United Tramways, Limited, is desirous of making an experiment, and has offered to make concessions which will probably be of considerable benefit to the Council should the experiment ultimately prove successful, and has further expressed its willingness to adopt any other system which may be proved superior after further experience shall have been gained, we think the Council might give provisional consent to the application being made by the company for authority to use the overhead trolley system of electrical traction, but so far only as regards that part of the company's tramways between the "Askew Arms" public-house and the Uxbridge-road railway station, and on condition that, in consideration of this concession, the company reconstructs, according to an underground system of electrical traction, the other two lines of tramway specified in Mr. Robinson's letter. This arrangement, if carried out, will afford the company an opportunity for a full and satisfactory trial of both methods of electrical traction upon roads quite at the outskirts of the County; and the Council will be able to ascertain whether the overhead trolley system proves successful in the Uxbridge-road, and is not a source of inconvenience, and also whether underground conduit and overhead trolley systems can be successfully worked, as we have been assured they can, in conjunction with each other. We recommend—

That Mr. J. C. Robinson, managing director and engineer of the London United Tramways, Limited, be informed that the Council will, on the terms stated in his letter, dated September 27, 1898, consent to an application being made by the company to the Board of Trade for power to reconstruct, in accordance with

the overhead trolley system of electrical traction, the tramways in that part of Uxbridge-road between the "Askew Arms" public-house and the railway station, on condition that the company do also, and on the same terms, reconstruct, according to an underground system of electrical traction, the tramways (a) from Uxbridge-road railway station by Goldhawk-road to Young's Corner, and (b) from Young's Corner to Hammersmith Broadway, and do submit for the Council's approval full plans, details, and other particulars of the works referred to."

Mr. Strong said he was instructed by the General Purposes Committee to move an amendment:—"That the Company be informed that the Council, whilst thinking it desirable to withhold its consent to the introduction of the overhead trolley system, until the Highways Committee has reported generally upon the whole subject of electrical traction, consented to an application being made to the Board of Trade to reconstruct the tramways referred to on the conduit or other approved underground system."

Mr. Cornwall seconded the amendment.

Mr. Westcott moved the adoption of the Committee's recommendation, and stated that he did so because the Chairman of the Committee, Mr. Benn, dissented from it. It was satisfactory to know that there was no difference of opinion in the Council as to the desirability of electric traction being tried in London. The only question between them was as to whether the method should be the overhead or trolley system, or the conduit or some other underground system. The overhead system had found favour in many places. Of 204 lines in Europe worked by electricity, only eight were worked from underground, whilst 173 were worked on the overhead trolley system. By adopting the recommendation of the Committee, the Council did not commit themselves to any system, but they would have the advantage of seeing the two systems at work, because if the Council consented to the overhead system being used on one section, the Company would have to try the conduit system on two other sections.

The amendment was rejected by a show of hands, and the Committee's recommendation was then agreed to.

**Sludge-Settling Channels, Barking Outfall.**—On the recommendation of the Main Drainage Committee it was agreed that the estimate of £2,750, submitted by the Finance Committee, be approved, that the work of constructing two additional sludge-settling channels at the Barking outfall be carried out without the intervention of a contractor, and that the plans, specification, and estimate of 20,550l. be accordingly referred to the manager of works for the purpose.

**Works in the Parks.**—The following recommendations of the Parks and Open Spaces Committee were agreed to:—(1.) That the Council do approve the estimate of 490l. submitted by the Finance Committee, and do accept the tender of Messrs. Harding & Son for the erection and completion of a new cartshed, bothy, office, &c., at Southwark Park for the sum of 490l. 3s. 2d. (2.) That the Council do approve the estimate of 490l. submitted by the Finance Committee, and that, subject to the usual inquiries proving satisfactory, the tender of the General Builders, Limited, for the erection and completion of a new bothy and additions to the conveniences at Parliament Hill, for a sum of 480l. be accepted.

**Private Bills Promoted by the Council.**—The Parliamentary Committee submitted a tabular statement showing the legislation affecting the Council in the session 1898. The following private bills were promoted by the Council:—London Building Act, 1894 (Amendment), bill passed; London County Council (Acton Sewage), bill passed; London County Council (General Powers), bill passed; London County Council (Money), bill passed; London County Council (Northern Tramways), bill withdrawn owing to the consents of local authorities to its being proceeded with being withheld; London County Council (Westminster Bridge and Embankment Tramways), bill rejected on second reading in House of Commons.

**Theatre Site, Tower Bridge Southern Approach.**

The Corporate Property, Charities, and Endowments Committee recommended, and it was agreed, that, subject to the terms of an agreement to be prepared by the solicitor, and to the Theatres Committee reporting favourably as to the suitability of the site, and also to the result of inquiries as to responsibility proving satisfactory, the Council do let to Mr.

Charles O'Malley, at a ground-rent of 375l. per annum, the site at Tower Bridge Southern Approach for the purpose of erecting a theatre.

**Examination of Water.**—The Water Committee recommended, and it was agreed—(a) That the expenditure of 7l. 10s. already incurred in analysing the water at Sunbury since September 8, be sanctioned. (b) That the chemist be authorised to collect and analyse two samples taken daily from the Thames above the water companies' intakes for a period not exceeding two months from October 18, at a cost of 5l. 15s. per week. (c) That the chemist be authorised to incur an expenditure not exceeding 50l. in collecting and analysing samples taken from the Lea above the water companies' intakes.

The Council adjourned noon after seven o'clock.

#### SANITARY INSPECTORS' ASSOCIATION

The annual general meeting of this Association was held on Saturday last, at Carpenters' Hall, London Wall, to receive the fifteenth annual report of the Council, the financial statement, and a report from the scrutineers declaring the result of the ballot for members of the Council and the Chairman for the ensuing year. A number of new members and one associate were unanimously elected, and then Mr. G. T. Dee (Westminster), the retiring Chairman, presented the Council's report, the most satisfactory feature of which was the increase of membership during the year by sixty-eight members and four associates. They had also added to their list of honorary members the names of eight eminent representatives of Belgian municipal bodies; among them were M. Buis, Burgomaster of Brussels, and the Burgomasters of Ghent, Ostend, and Bruges. From the list of honorary members they had lost by death two of the most illustrious of the early pioneers of sanitation, one in England, the other in France: Sir Robert Rawlinson and Dr. de Pietra Santa, of Paris. The continual growth of the Association had thrown more labour on its officers and had also led to ever-increasing expense, and the time had come when they must seriously consider whether it was wise to continue to spend annually a little more than their income. It would be for them to consider whether with the small annual sum they contributed they were doing all they would like to do for each other and the National Health. References were made in the report to the success of the *Journal* through the untiring perseverance of its editor (their hon. secretary), Mr. E. Tidman; to the proposed Superannuation Bill for sanitary officers, and to the new Examination Board for sanitary inspectors. All efforts to get the superannuation scheme forward had been futile during the past session, in common with the efforts of the Metropolitan officers and the Municipal officers in favour of similar proposals. This was naturally a cause of disappointment, but it must not be allowed to be a reason for discouragement.

The long-talked-of conjoint Board of Examination had at length been constituted, and an Association had been formed composed of three representatives of the Local Government Board, two of the Sanitary Institute, and one each of the National Health Society, the Plumbers' Company, the Carpenters' Company, the Incorporated Society of Medical Officers of Health, the Royal Institute of British Architects, the Association of Municipal and County Engineers, and the Royal Institute of Public Health. The non-inclusion of the Sanitary Inspectors' Association as one of the bodies represented in this new Association was a matter for great regret, and if, as proposed, it took the title of "The Sanitary Inspectors' Examination Board" without the addition of the word "Limited" the public would be led to think the Sanitary Inspectors' Association was referred to when it was not, and confusion would be caused which must be injurious to their Association. A letter of objection had therefore been sent as a memorial to the Board of Trade, and each of the bodies represented on the new Examination Board had also been asked to give full consideration to the claims of the Sanitary Inspectors' Association to due representation on that Board.

In a discussion which followed the reading of the report, the suggestion was made by Mr. H. Alexander that members should support the Municipal Officers' Association as well as their own, for if the Superannuation Bill promoted by that body was got through Parliament, the



Sanitary Inspectors would be included. After some further discussion, the report was unanimously adopted and the financial statement was afterwards received. The scrutineers declared the result of the election of next year's Chairman of the Council, Mr. T. J. Moss Flower (Bristol) receiving 119 votes, Mr. Grigg, ninety-three; and Mr. G. T. Dee, 80. The members of Council elected were Messrs. G. T. Dee, W. W. West, H. Alexander, Travis, Grigg, Wilkinson, Irwin, Rothera, Bell, Jacklin, Bellingham, Shawcross, Thomas, Skinner, Branson, Patterson, Young, Fairchild, Lowther, and Press. Mr. Dee, in vacating the chair, introduced Mr. Moss Flower, on whose election he heartily congratulated the Association. The new Chairman of Council having briefly acknowledged the honour conferred upon him, the business, which consisted mainly of votes of thanks to the honorary officers of the Association, and to the Carpenters' Company for the use of their excellent hall, was proceeded with.

#### ENGINEERING SOCIETIES.

**INSTITUTION OF JUNIOR ENGINEERS.**—The annual general meeting of this Institution was held on Friday, the 14th inst., at the Westminster Palace Hotel, the retiring chairman, Mr. H. B. Vorley, presiding. The Report of the Council was read. During the past year nine meetings had taken place, at one of which a Conference was held with the Discussion Section of the Architectural Association on "The desirability of a closer relationship between the architect and the engineer." Twelve visits to engineering works in and around the metropolis had been made, and at the summer provincial meeting (Liverpool) a week was spent in this way. The special fund started with the object of opening an office and reading-room for the members, now much needed, made but slow progress, the total to date being but 80*l*. The total membership stood at 516, a net increase of 36 on the year. Sympathetic reference was made to the loss which the Institution had sustained in the death of Dr. John Hopkinson, Past-President, and of Sir Benjamin Dobson, of Bolton, and Mr. Thomas Mudd, of Hartlepool, hon. members. The ballot resulted in the election of the following:—Chairman, Mr. Basil H. Joy; Vice-Chairman, Mr. Kenneth Gray; Hon. Librarian, Mr. L. H. Rugg; Hon. Auditors, Messrs. W. B. Clarke and E. King; Council, Messrs. J. N. Bool, F. D. Napier, J. E. Raworth, and A. E. Taylor; Secretary and Treasurer, Mr. W. T. Dunn.

#### THE METROPOLITAN ASYLUMS BOARD AND BROOK HOSPITAL.

On Monday, at the offices of the Metropolitan Asylums Board, Norfolk House, Mr. W. E. Knollys, C.B., Chief Inspector of the Local Government Board, assisted by Mr. Gordon Smith, Architect to the Local Government Board, opened an inquiry into the circumstances attendant on the erection of Brook Hospital, opened in August, 1896.

The Inspector stated that the inquiry originated on the application of the Asylums Board to borrow 100,000*l*, in addition to 200,000*l* already sanctioned, for the erection of Brook Hospital. He was instructed to inquire into the circumstances which had led to the large excess of the expenditure over estimates, the responsibility of the architect, and the amount of supervision exercised by the managers of the Hospital Committee. On February 6, 1894, the proposal for the erection of a hospital at Shooter's Hill, to be called Brook Hospital. The accommodation was to be for 500 patients, and the cost 194,000*l*. It was stated that the original estimate was for 200,000*l*, but was reduced by 26,000*l*. After some correspondence, the Local Government Board gave their approval, subject to further consideration by the Committee of certain questions of detail which had arisen. The Local Government Board also intimated that they thought the estimated cost still very high. Subsequently an application was made for power to sanction certain expenditure on roads, &c., and the Local Government Board replied asking for details, and another estimate of the total cost. The latter was then returned by the Asylums Board at 226,000*l*. In August, 1894, an order was made for a loan of 200,000*l*. On October 14, 1896, a report was furnished showing an estimated expenditure of 230,000*l*, and asking for a further sum of 75,000*l*. The Local Government Board wrote for further information, and on August 5, 1897, it was reported that the architect estimated the total cost of the buildings, &c., at 268,000*l*, but that the probable total outlay would be 303,000*l*. What he had to inquire into was the difference between the tenders of 218,000*l*, and the expendi-

ture of 268,000*l*. Then they would have further to inquire into how it was that the total cost for everything would be brought up to 303,000*l*.

Mr. Duncombe Mann, the Clerk to the Asylums Board, detailed the circumstances which led up to the erection of the hospital. In 1893 the Metropolitan Asylums Board decided to erect a hospital on the Shooters' Hill site. The work was placed in the hands of Mr. Aldwinckle, the architect, who drew up the plans, and the building was commenced at an estimated cost of 200,000*l*. Subsequently it was found necessary to make alterations in the specifications, and as a result of those alterations an additional 100,000*l* was required.

Referring to the 5,000*l* estimate for making sure the foundations, and the eventual expenditure of 19,000*l*, the Inspector asked Mr. Brown, ex-Chairman of the Brook Hospital Committee, whether the Committee inspected the site, and were satisfied as to the necessity of improving the foundations, and the expenditure. Mr. Brown: Unfortunately, the necessity was not seen until large areas of ground had been opened.—The Inspector: How was that?—Mr. Brown: As the work proceeded it was seen that the clay was full of soapy veins, and that it would be necessary to take it out and have a firmer foundation. It never dawned on any of the Committee that the cost would come to 19,000*l*, but then this work was going on for twelve months. Mr. Brown went on to say that the expenditure on drainage was much larger than had been anticipated, and certain things were ordered without the knowledge of the Committee, while the latter ordered some alterations without reporting them to the managers. There was no provision for the heating, and tenders were called for from selected firms, the lowest of 10,000*l* being accepted. The Inspector: I am not quite satisfied that the Committee were sufficiently on their guard.

Mr. Aldwinckle, the architect, in reply to the Inspector, said he considered that in all he did he was justified by the general orders of the Committee. With reference to the foundations, they gave him authority to do what was necessary. If he had not done what he did he would have been failing in his duty. He did not select the site, but he did the best he could with it.

The Inspector: You reported that the foundations would have to be made secure at a cost of not less than 5,000*l*. Were you aware it would cost more?—I became aware of it as time went on. Did it not occur to you to bring that before the Committee?—I thought they were aware of what was going on. They frequently visited the works, and it was a matter of common conversation that we were expending a lot of money.

The Inspector: Yes, but Mr. Aldwinckle is not the authority to tax the ratepayers, whereas the Asylums Board is.

Mr. White said Mr. Aldwinckle was in no way answerable for the site. He was simply told to build on it. The trouble was that the foundations were largely due to the Local Government Board requiring the managers to "set back" the hospital so that, instead of its being on the plateau, it was "pushed down the hill." As it was, Mr. Aldwinckle, in his original estimate, put down 3,500*l* extra for the foundations.

The inquiry was then adjourned until Tuesday, when the Inspector stated that he intended to put down the details of the expenditure under five heads, viz., necessary expenditure with the consent or knowledge of the Committee; similar expenditure on the architect's responsibility, or that of the Managers; and other expenditure with or without authority.

Resuming his examination of Mr. Aldwinckle, the architect, the Inspector asked:

Do you acknowledge that you were aware that a large extra expenditure was being incurred with regard to making good the foundations?—I was aware that we were spending more than 5,000*l*, but I did not know that the total would be so much.—Did not the clerk of the works relate that over 19,000*l* was being spent?—He would only have to do with the accounts. His responsibility would be covered by my own.—Yes, but he might have called your attention to the fact?—There was no necessity for his doing so. I frequently visited the works, and I accept the responsibility of what was done.—Yes, but you reap an advantage from the disbursements?—I did not think any one would suggest that I had this work done for my own benefit.—No one has suggested it, but I say that, for your own protection, when you found the cost largely running up, and knowing that you would benefit by it, you might have reported it.—I never thought such a suggestion would be made, at all events, by my clients.—The suggestion is not that you encouraged the expenditure, but that you did not report an increase from which you would reap a benefit.—I question the benefit, sir, taking it all round. If you are going to reckon it by pounds, shillings, and pence, it is one thing, and if you take the per contra element it is quite another.

Mr. Duncombe Mann said that he understood Mr. Aldwinckle to mean that he did that which he thought to be absolutely necessary, and by doing so had incurred a great deal of criticism, and done himself more harm than good.

Mr. White observed that Mr. Aldwinckle evidently

under-estimated the work originally contemplated by about half. He said it would cost not less than 5,000*l*, and it then represented about 10,000*l*. Speaking from experience, he (Mr. White) knew how difficult it was to give a rough estimate of work of this character. It was admitted, however, that Mr. Aldwinckle was in error in not communicating with the Board.

Mr. Aldwinckle, replying to the Inspector, said considerable alterations were made in the levels, but he did not report them to the committee. Managers—What was the reason why they should not have reported the alterations?—Only because we were very busy, and I did not wish to cause any delay.—May I take it that 900*l* was sanctioned on this head by the Board, and 2,000*l* was spent without their knowledge?—Yes, that is so; I thought I had the general authority of the Board to do what was necessary. Mr. Aldwinckle further stated that the estimate for the drainage was 13,326*l*, and this sum was exceeded, owing to numerous causes, by 4,980*l*. With regard to sundry other items, Mr. Aldwinckle said he really did not know whether he ought to have reported them, but at all events he did not. He added: There was no provision in these contracts for contingencies, which is the usual practice. If there had been such provision, I should not have got into trouble.

The Inspector: I don't think you can deal with a public building as you would with a private one. You must remember that the committee charged with the erection of a public building are trustees for the money of the ratepayers. Mr. Aldwinckle said that the improved stoves were obtained for the wards. They were privately ordered because they were required to be of peculiar construction, and were part of the general work.

Mr. Gordon Smith said that other institutions had to be content with iron stoves. The Inspector: Yes. The Inspector: Had the order with a firm of your own selection?—Yes, but I took great care over the matter, and got the stoves at a reduced price.

After the adjournment, Mr. Abraham Monson, a member of the Asylums Board, made a statement to the effect that he had studied the case, and had come to the conclusion that although the architect was instructed to prepare plans for a hospital on Shooters' Hill, he prepared plans for a hospital on the flat. The site was made to fit the plans, instead of the plans being made to fit the site. As to the nature of the ground, it could easily have been ascertained by sinking "trial holes." Moreover, the work as carried out was not in accordance with the plans approved by the Local Government Board.

Mr. Aldwinckle denied the accuracy of these statements, and produced the plans, which Mr. Knollys inspected.

In every case, Mr. Aldwinckle contended, provision was made for the exigencies.

Before making the plans he was carefully over the site and surveyed it. He allowed for the "slope" at Shooters' Hill, but part of the buildings were on the flat.

In reply to Mr. Monson, Mr. Aldwinckle emphatically denied that the building was carried up "on piers."

Mr. Monson said the extra cost of the hospital was caused by shifting the earth to make it fit the building.

The inquiry was then adjourned till Wednesday, when Mr. Aldwinckle produced a further list of extras, including an item of 36*l* for fire insurance. Questioned as to this, he said it was an item in excess, because the work was stopped on account of the severity of the weather, and two instalments of insurance had to be paid instead of one.

The Inspector: I can't understand how it was the sum was paid to the contractors without the Board knowing what it was for.

Mr. Duncombe Mann: When a public body accepts a contract they are bound to pay the amounts certified for by the architect.

The Inspector: That does not affect the fact that it is the duty of the Board to inquire of the architect what the sums are for. From time to time the Board should require a financial statement from the architect, showing how the sums he has certified for have been applied.

The Mann: That has been done. We have had an inquiry analogous to the one you are holding now. The Board employs competent architects and surveyors.

The Inspector: Therefore they are to accept, without question, everything put before them? Mr. Mann: We call for explanations of additional expenditure.

The Inspector: Long after it is made, and when it is too late. I suppose I am to take it that no proof of that 36*l* can be produced. I can't understand why the architect was not pulled up.

Mr. Mann: Do you mean the work should have been stopped?

The Inspector: No; but he should have been told that he must report extra expenditure to the committee.

Mr. Mann: That was done in pretty continuous fashion.

The Inspector: Then you say that the architect continued ordering these extras notwithstanding continued warnings from the Board?

Mr. Mann: No, I don't. I say the whole of the



extras might have been included in the 150,000l. after the payment of which the Board began inquiry. We then knew we were committed to about 220,000l. Exhaustive inquiries were made, and a report was sent to the Local Government Board.

The Inspector: Nothing has been sent to the Local Government Board to show that the architect was warned by the Board as to spending money without authority.

Mr. Mann: The enormous excess was not apparent till the whole thing was done and it was too late to warn anybody.

Mr. Brown, ex-chairman of the Brook Hospital Committee, tendered some further explanations.

The Inspector: It cannot reasonably be contended that any public body should have the power of spending money with any one man. Mr. Mann's contention is that they have no right to question the architect's certificate. I have never heard of that before in connexion with a public body.

Mr. Mann: It is a question of law. The Board is bound to pay its contractors.

The Inspector: Yes, but there is a duty resting with the Board to see what the certificates are granted for.

Mr. Mann: That would imply suspicion of the architect.

The Inspector: Why not? All public bodies should have such a suspicion. They should not accept anybody's statement without proof.

Mr. Mann: Well, we employ men who would throw up their contracts if that were done.

At a later stage, Mr. Mann stated, in reply to Mr. Gordon Smith, that the architects of the Asylums Board were not appointed "under the seal of the Board."

Mr. Smith: I always recommend that that should be done, and the Asylums Board should insist on it. In that case you can introduce what terms you like.

Mr. White, chairman of the Special Committee which inquired into the matter on behalf of the Board, said the whole of the extras—with trifling exceptions—would have been included in the specifications if the Board had not built the hospital in such a hurry. It was utterly impossible for any public body or committee to watch the details of such an important work like this as it progressed. They must trust to their officers. The Board should be protected by a clause in the contract to the effect that no extra would be paid for unless countersigned by the clerk, who, of course, would not act without authority. The architect should not have the power of spending the money of the ratepayers without the sanction of those who represent the ratepayers. In this case, the architect very nearly had *carte blanche*. As to the cost of the foundations running up from 5,000l. to 10,000l., even if the Committee had gone over the site every time they were there, they could not have realised what the ultimate cost would be.

Mr. Brown urged that the large expenditure was due to the nature of the site, and the short space of time allowed for the preparation of the plans.

The Inspector intimated that he would report in due course to the Local Government Board.

## NATIONAL ASSOCIATION OF MASTER HOUSEPAINTERS.

THE fifth annual convention of the National Association of Master Housepainters of England and Wales, which is this year held in Liverpool, opened on the 11th inst. at the City Hall, Eberlestreet. Upwards of 250 representatives from branches all over the country attended. The convention is made the occasion of an exhibition at the City Hall of some specimens of decorative art as applied to the work of the master painter, including artistic panels, wall papers, &c. There is also an exhibition of competitive work by apprentices. The convention opened with a reception of members and visitors by the President, Mr. Alex. G. White, of Liverpool, in the ante-room of the Hall. The Lord Mayor (Alderman John Houlding) afterwards presided at the opening meeting, and welcomed the members to the city.

The President then delivered an address. Every year since its formation had seen a growth and expansion of the Association, until at the present time they had fifty affiliated local associations, representing over 1,000 firms, besides over 250 individual members. The great and fundamental policy of the National Association was to foster and develop local associations. Their work was mainly missionary work, but also educational, aiming at improving not only themselves but their workmen. They wanted to train up the young craftsman in the way he should go. The end and aim of their convention business was the bettering of their industrial position, the stimulating of their artistic ideals, the improvement of their relations with the public and with kindred industries, and the dissemination of a truer conception of the importance to the public, in a sanitary, æsthetic, and protective sense, of the ancient handicraft of which the members of that Association were exponents. In his way the sanitary painter was even more important than the sanitary plumber. When it was realised that one-third of our lives is passed in our bed-

rooms alone, and probably half or more indoors, how important did it become to have our dwellings sanitary in the highest degree; and for this sanitation the public must depend mainly upon the painter. If the public only realised what whitened sepulchres they go into in the shape of rented dwellings, offices, shops, and the like, in which this elementary sanitary work had been grossly neglected, they would insist upon every master housepainter being registered and licensed like any doctor, lawyer, or other professional man whose work is of such general public importance as to require a public certificate of competency to entitle him to practise. The modern system of competitive tendering for sanitary work of any kind was simply a premium on scamping. There were no worse offenders against common sense in this respect than committees and public bodies. It seemed to him that if those who obtained competitive tenders made it a rule to accept the tender nearest in price to an average of all the tenders received, much better results would accrue, and a truer economy be observed. Not less important in its bearing upon the comfort and happiness of the public was the housepainter's work from the æsthetic side. Far-reaching and subtle were the influences of æsthetic colour in the domestic and business environment of our daily life. The President then dealt with the protective or economic sides of the painter's work, the importance of preparation, and the folly of rushing the work.

On the motion of Mr. Carlton, seconded by Mr. Gibson, a vote of thanks was passed to the President for his address, and a similar vote was, on the proposition of Mr. W. Allon, seconded by Mr. P. H. Brankin, accorded to the Lord Mayor.

A closed session was held in the afternoon, when the reports of the Secretary, Treasurer, and various Committees were received and considered. An address was given by Mr. B. J. Brankin, and a report received from the Council of the Institute of British Housepainters. The Secretary (Mr. W. G. Sutherland), in his annual report, said the year which had just closed had shown a steady and constant development of the influence of the Association. Nine local associations had been added to their ranks, and the private and direct membership had been increased by forty-five additions. The total membership of the Association might be roughly estimated at 1,500. The general drift of the labour movement throughout the country had been in the direction of an increase of wages and an extension of privilege, most of the large areas having arranged with their men for increase of wages for a period extending over several years. There had been a concerted attempt on the part of the operatives in many directions to impose restrictions on the number of boys apprenticed to the painting trade. In most cases these attempted limitations had failed. An important matter during the year had been the coming into operation of the new Workmen's Compensation Act. The Committee, acting on the best information before them, and with the desire to act solely in the interests of the members, recommended the members, first, to insure against the risks imposed on the members, and second, to continue to insure on special rates.

In the evening a reception was held in the City Hall by the President and Mrs. White, and attended by some 400 representatives and their ladies. The adjudicators in the apprentices' competition (Messrs. P. H. Brankin, W. Morrow, J. Scott, and Pollard), who spoke very highly of the general character of the work shown, announced their awards, the names of the successful competitors being: C. Hadlett (Stockton-on-Tees), two prizes; W. Adcock (Barnsley), A. Wych (Denton), F. L. Cunliffe (Edinburgh), two prizes; W. Beattie (Belfast), four prizes; G. M. Atkins (Bradford), W. J. Palmer (West Hartlepool), T. W. Croft (Stockton-on-Tees), C. Charneck (Bradford), E. W. Webb (Doncaster), J. Fieldhouse (Bradford), W. H. Helme (Swansea), A. Dickinson (Blackburn), P. Kehoe (Dublin), and R. Fletcher (Manningham). A vote of thanks was accorded to the adjudicators on the motion of Mr. Preston (Blackburn), seconded by Mr. Sutherland (Manchester), Messrs. Pollard (Leeds), and Brankin (Philadelphia) responding. The latter referred incidentally to the keen competition which Germany was making in all branches of industry and craftsmanship, pointing out the splendid training which the mechanic received from the Government in that country and the necessity for renewed effort and system in England and America.

The sittings were resumed at the City Hall, Eberlestreet, on the 14th inst. by Mr. A. G. White presiding. Both the morning and afternoon were occupied in the reading of papers upon subjects affecting the Association and its work.

### The Decorator's Position.

Mr. G. H. Morton, jun. (senior warden of the Liverpool Guild), read a paper on "The Decorator's Position." There appeared to be various influences at work which aimed at taking from the decorator the artistic part of his craft, and leaving him only the technical or the practical side. The decorator's work must include both art and craft, and the more art he could infuse into his craft the greater he would be. The painter's craft was, he took it, one in which the practical predominated. The position the decorator held in the public mind had been very clearly exemplified in Liverpool recently in the com-

petition for the decoration of the Town Hall. The lesson of that competition was of importance to decorators. Its history was remarkable. Drawings and tenders were invited, accompanied by a general specification from the Corporation architect. Each competitor was to suggest his own scheme, considerable latitude being allowed, so much so that the decorator was practically unlimited, and the conclusion was that the best suggestion would be adopted. All this was considerable to the decorators, and would have been satisfactory had there been a sum stated to work to; but no amount was given, and there was nothing to prevent one scheme of 2,000l. and another of 20,000l. being submitted. That some idea of unfairness presented itself to the Corporate mind seemed evident from the fact that after one of the schemes—the highest, he thought, in amount—had been recommended for acceptance by the Finance Committee, on being put before the City Council, it was referred back, with instructions to the committee to obtain a scheme from an "expert" upon which the various competitors might submit tenders. The competition, therefore, was changed from one of design, or competition, to the more usual one of money. The schemes of the decorators were returned to their respective owners without adequate acknowledgment for drawings of undoubted merit, which cost no inconsiderable amount to produce, and, what was of still more importance to them, the position of the decorator as an "expert" of decoration was entirely ignored. With the decorator, art was supreme. It was with the artist and the architect that decorators were more closely connected, and individuals in both those professions had been and were endeavouring to take from them the art position of the decorator's work. The work of building was, he maintained, a co-operative one, and in order to be a success all that could be done was to bring out the very best of the various craftsmen engaged upon it should be done. In saying that, he assumed that the decorator was a trained craftsman, and that he was worthy to co-operate with and to command the respect of the architect. Unfortunately, there were many incompetent persons who called themselves "art" or "artistic" decorators, though they had absolutely no claim to the title. He pleaded for the maintenance of a high standard. It was essential to distinguish the decorator from the painter who, by lack of artistic knowledge or inclination, had no claim to the title. He attributed the use of the term "decorator" by incompetent people to be one of the causes why decorators as a class were losing ground on the art side of their craft. On the one hand, they had the artistically incompetent, and on the other the technically incompetent, each knowing only one side of the subject. The decorator, however, who combined technical skill with high artistic training had nothing to fear; but he who failed to realise the situation would find men of a higher culture taking his place, and his position as a decorator gone.

Mr. Barker (Leicester) moved, and Alderman Crossley (Newark) seconded a vote of thanks to Mr. Morton, which was agreed to.

### Modern Decorative Design and Colour.

Mr. Alex. Rottmann read a paper on the subject of "Notes and Queries on Modern Decorative Design and Colour." The tendency in new designs, he said, was towards pure colour. Lighter and less sombre tints were now used, with the result that our homes appeared much brighter than formerly. Another marked preference was in the direction of colour contrasts rather than colour harmonies. The modern decorators laid pure colour side by side in the greatest contrast, and colours that were once supposed to fight each other now appeared together as good friends. Prussian blue was to be seen hand in hand with verdigris; indigo with emerald green; violet and puce with geranium lake. On the Continent up-to-date productions were known as "English decorations," and they were now largely imitated by Continental craftsmen. If the Japanese inhabited the British Isles they would, he said, discover and surprise nature's hidden beauties just as they had done in their own country. In rural England there was an inexhaustible fund of beauty and charm if one cared to look for it. It was the study of his own surroundings, the knowledge of where to look for artistic ideas and inspirations that gave the Japanese artist his great originality. English designers would do well to copy that oriental example. The growth of modern decorative design was steadily progressing in this country. Following upon a discussion, a vote of thanks to Mr. Rottmann was moved by Mr. Harris (Plymouth), seconded by Mr. Tome (Wolverhampton), and carried.

Colonel R. J. Bennett submitted a short paper on "Some Considerations on the Consolidating of our Trade Interests."

Mr. Maurice Dockrell (Dublin) moved, and Councillor Howarth (Burton) seconded, a vote of thanks to Colonel Bennett for his paper.

This concluded the business of the morning session.

### The Compensation Act.

The proceedings of the convention were resumed in the afternoon by Mr. J. Corbet M'Bride reading a paper on "Three Months' Working of the Compensation Act, 1898." The speaker dealt with the leading features of the Act, and said that the ques-



tions in connexion with its working which cropped up most frequently were such as "Can a man injured while going to work be said to be injured in the course of his employment?" "Is it wilful misconduct when an accident arises through a man unintentionally taking too much drink?" And "is a ladder by itself a scaffold?" He went on to instance several cases where claims had been paid for injuries. Injuries to workmen were often more expensive than fatal accidents, which did not carry more than 300l. compensation. He strongly advised employers to exercise the greatest care in seeing that their ladders and scaffolding were always in a sound condition. The bulk of accidents arose from defective scaffolds or falling ladders, and if these were always properly secured risk to both employer and workman would be considerably diminished.

On the motion of Mr. White (Liverpool), seconded by Mr. Smith (Sheffield), a vote of thanks was accorded to Mr. McBride for his paper.

After the various papers had been disposed of, the convention, in closed session, proceeded to elect the President and officers for the ensuing year. Mr. J. C. M. Vaughan, of Hereford, was unanimously elected President, and the chosen vice-presidents were Mr. J. W. Barker (Leicester) and Mr. Harris (Plymouth). Mr. Thomas Preston (Burnley) was re-appointed hon. treasurer, and Mr. W. G. Sutherland was re-elected hon. secretary.

In the evening, the Lord Mayor and Lady Mayoress were "at home" to the Association at the Walker Art Gallery.

Thursday, the 13th inst., was devoted to excursions. The annual dinner was held in the evening at the Adelphi Hotel.

Friday was also devoted to excursions.—We are indebted to the Liverpool *Daily Post* for the above report.

### Illustrations.

#### PROCESSIONAL CROSS FOR ST. PAUL'S, LONDON.

**T**HIS cross has been designed as a processional cross for St. Paul's, and is the gift of Mrs. Barry to the Cathedral. The materials are silver, water-gilt, with carbuncles to form the four bunches of grapes; enamel on the back and front of the cross, and a green onyx forming the ball at the top. Owing to the size of the cross, and the necessary limitations of weight, every part of it has had to be kept as light as possible, and the whole of the metal work is repoussé, with the exception of the cherubs' heads below the cross, which have been cast from a model by Mr. Pegram. The enamels have been executed by Mr. Alexander Fisher from full-size drawings by the architect, and the figure on the front, which is very large for enamel, has been successfully carried out by Mr. Fisher in three pieces, the joints coming above and below the drapery. The shaft develops from the round to a hexagon and thence to the flat of the cross, which is formed with two thicknesses (a front and a back face of metal) fixed to a mahogany frame. The total dimensions of the cross are, over all, 9 ft. 4 in. high by 20 in. wide. From the top of the ebony shaft to the top of the cross is 4 ft. 4 in. high, and the enamel figure is 14 in. high.

The work has been carried out by Messrs. Elsley & Co. from the designs of Mr. Reginald Blomfield, architect.

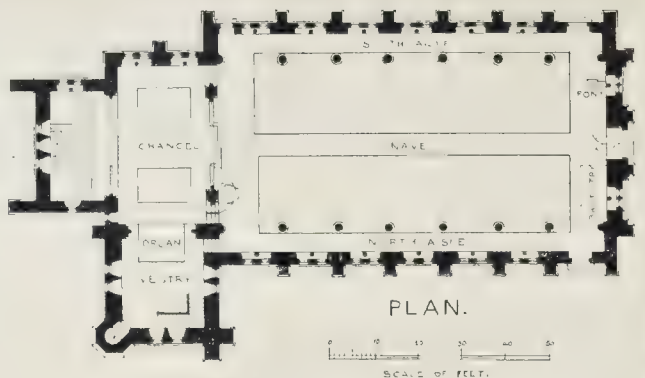
#### COMPETITION DESIGN FOR COLCHESTER TOWN HALL.

This is the elevation, with two plans, of a design prepared by Mr. Beresford Pite in competition for the Colchester Town Hall, and was exhibited at the Royal Academy of this year.

It was stated in the instructions to competitors that the building was to be regarded in part as a memorial of Queen Victoria's remarkable reign; also, that the design should be complete in itself without the proposed tower, which might be added subsequently.

These circumstances, in Mr. Pite's opinion, dictated an architectural character more monumental and less prosaic than would under other circumstances have been permissible.

The three great arches, behind which the front is recessed, with the semicircular alcove in the centre compartment, would have had a striking effect. The memorial character of the design is emphasised by the sculptured group in the centre, between the outer flights of steps, and the crown character given to the termination of the tower.



Church of St. Michael, Llangevnyd.

#### CHURCH OF ST. MICHAEL, LLANGEVNYD, GLAMORGAN.

The drawing, which illustrates this church as carried out, was exhibited in the Royal Academy this year. The original design for the same building was exhibited in 1894.

The church has been erected as a memorial to the late Miss Olive Talbot, of Margam Abbey, and accommodates about 600 worshippers. The plan is so arranged that practically every member of the congregation can see the altar.

The church is built of coursed ashlar-faced local stone, with hard green Bridgend stone dressings, cement pointed throughout. Owing to the exposed situation of the building a damp-proof course has been introduced throughout the west wall. The open timber roof, seats, and stalls are of pitch pine, left free from stain or varnish. The pulpit is of dark green Bridgend stone and pink alabaster, with Irish red marble shafts. A baptistry for total immersion is also provided.

The work has been carried out by Mr. McGaui, of Bridgend, under the direction of the architect, Mr. G. E. Halliday, of Cardiff.

#### BARNOLD SWICK CHURCH, YORKSHIRE.

This proposed new church, which is to take the place of the present inadequate building, is designed for a square site, contiguous to and part of the present one, to accommodate 760 worshippers, not including the choir. It is to be built in the local stone, with vaulted match-boarded and groined ceilings. The body of the church will be kept plain. The intersecting arches are to spring from columns built up of unpolished marble, in alternating colours of red and white, and the arches similarly treated. The church will be fully lighted with large bold windows, and, if possible, be fitted up with electric light. The tower also will be built in stone and will be more elaborate. The illustration of this, which is given here, was exhibited in this year's Royal Academy.

The architects for the proposed new church are Messrs. Brunet & Thorman, of Tadcaster and Leeds.

#### HOSPITAL OF SS. JOHN AND ELIZABETH, ST. JOHN'S WOOD, N.W.

Our readers will probably know the church of St. John of Jerusalem in Great Ormond-street, which was attached to the Hospital of St. Elizabeth. The site of this building having been bought for the enlargement of the Children's Hospital, has necessitated the removal of the establishment to the present site, and the re-erection of the old church as shown.

The treatment of the hospital has under these altered circumstances been governed by the style of the church, and is intended to be executed in stocks for the general walling, with red brick arches and quoins to the windows and Portland stone for the other dressings, which is the material used in the old front of the church, the only portion which was visible of the exterior in its old position. As will be seen by the plan, the drainage has been made as simple and straightforward as possible.

All floors are fireproof, the flooring being on the solid, with space above the ceiling of the lower ward for running wires and pipes and deadening sound. The flooring is of teak except in the lavatories, &c., which are tiled.

The roofs are flat, for use as a promenade. The work is being carried out by Mr. C. J. Hinsley (London), under the direction of the architect, Mr. E. Goldie.

The house at present on the site is used as a convent and for administrative purposes.

#### THE STANDARD BUILDINGS, CALCUTTA.

We give a view, reproduced from a photograph, of this building, as an example of the modern architecture of that city.

The buildings, which stand in Dalhousie-square, Calcutta, were commenced early in 1894, and completed in May, 1896, and were designed by and carried out under the supervision of Mr. F. W. Stevens, of Bombay, the Company's Consulting Architect; Mr. W. G. L. Cotton being the resident engineer, and Mr. J. McMinn being the sub-engineer and builder.

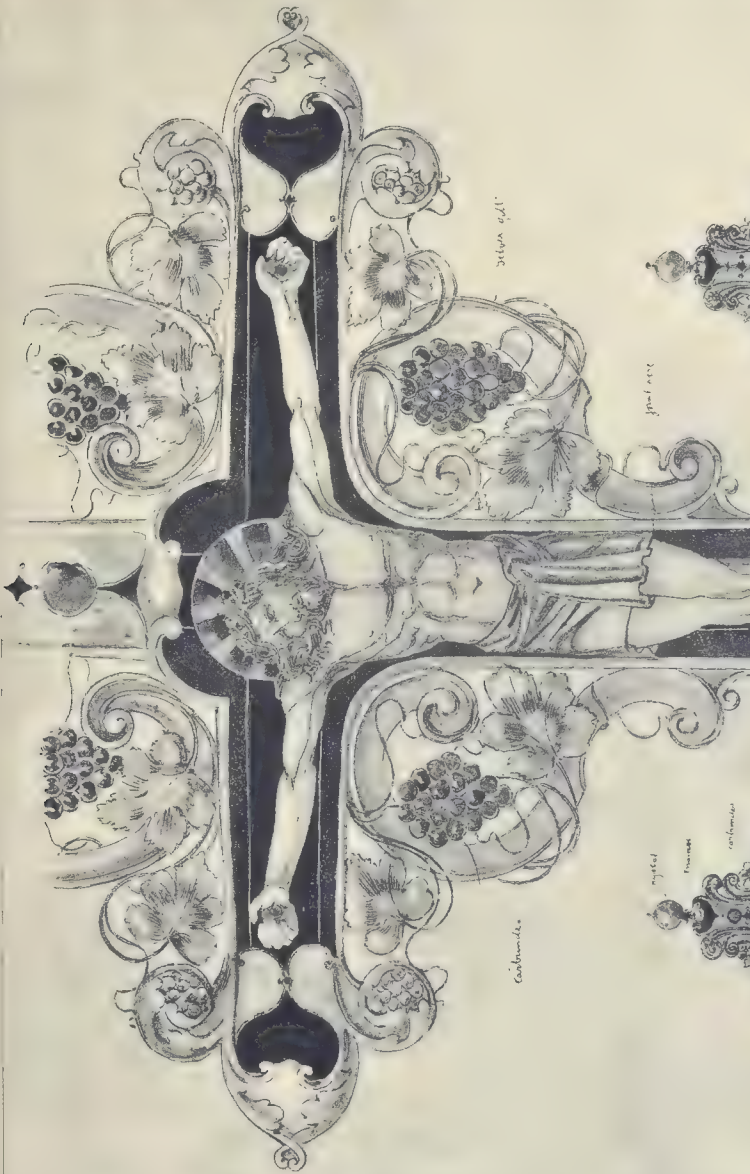
The premises are in two blocks, the principal fronts of which face north and east, and these blocks are divided by a *cul de sac* lane, Vansittart-row, over which bridges are placed on the first and second floors to connect the two blocks. The bridge on the latter floor is surmounted by a pediment, including a group of sculpture representing the Wise and Foolish Virgins of the parable, and at the apex is a colossal stone statue representing Atlas bearing the Globe. In the spandrels of the lower arch, over Vansittart-lane, are two other statues in three-quarter relief, one representing "Life" and the other "Death." These were all executed by Mr. Harry Hems, of Exeter.

The height of the building is 68 ft. from the ground line, and the main frontage on Dalhousie-square side 178 ft. in length, with a tower at the angle of Wellesley-place and Dalhousie-square 140 ft. in height. The foundations of this tower were simply but ingeniously arranged by the architect to meet the difficulty of equalising the pressure on the foundations from the superincumbent weight, by constructing an inverted grained brick dome springing from the four sides of the lower walls. This dome covers the whole of the inner space of the tower with the usual footings on the outer side, and ensures an even pressure over the whole foundations below.

The ground floor of the West Block is arranged for a bank, at present occupied by the Credit Lyonnais, and for a Brokers Hall, and that of the East Block for a portion of the Viceroy's bodyguard stables, for a European Police Superintendent's quarters, both of which are now occupied, and for a shop or office. The first floor is arranged for commercial requirements; the second floor of the West Block as offices for the Standard Life Assurance Company, and that of the East Block as a residence for the Secretary of the Company.

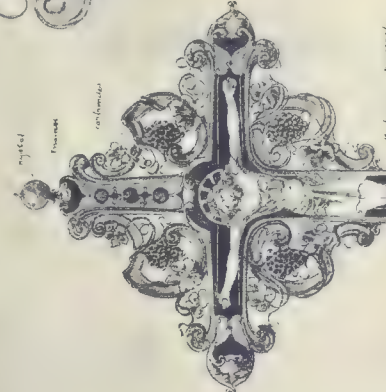
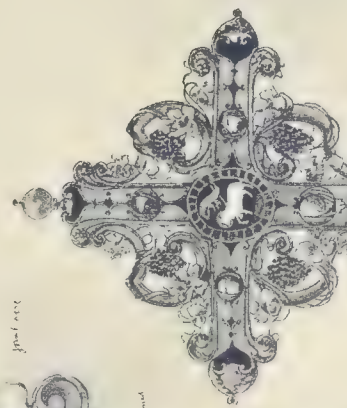
The bank premises contain a hall with galleries about 18 ft. wide on three sides, each of which overlooks the floor, and which form rooms, or rather platforms, for assistants, clerks,





Detail of 1st.

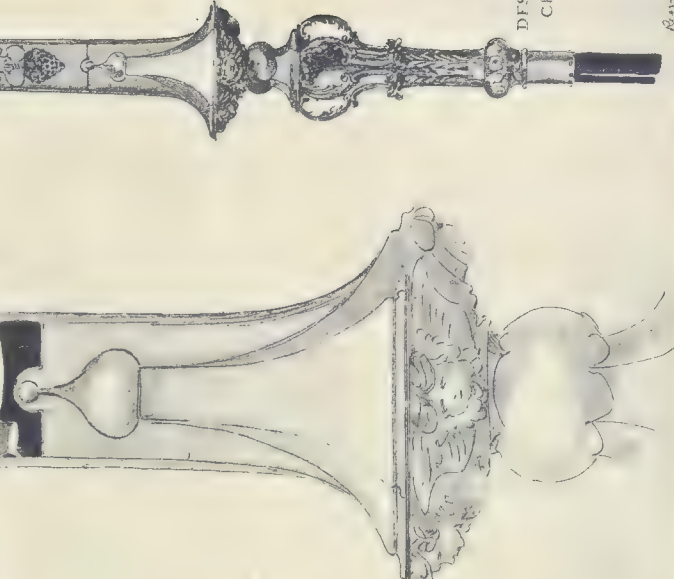
Small cross



1st figure - Natural



SCALE OF FEET.

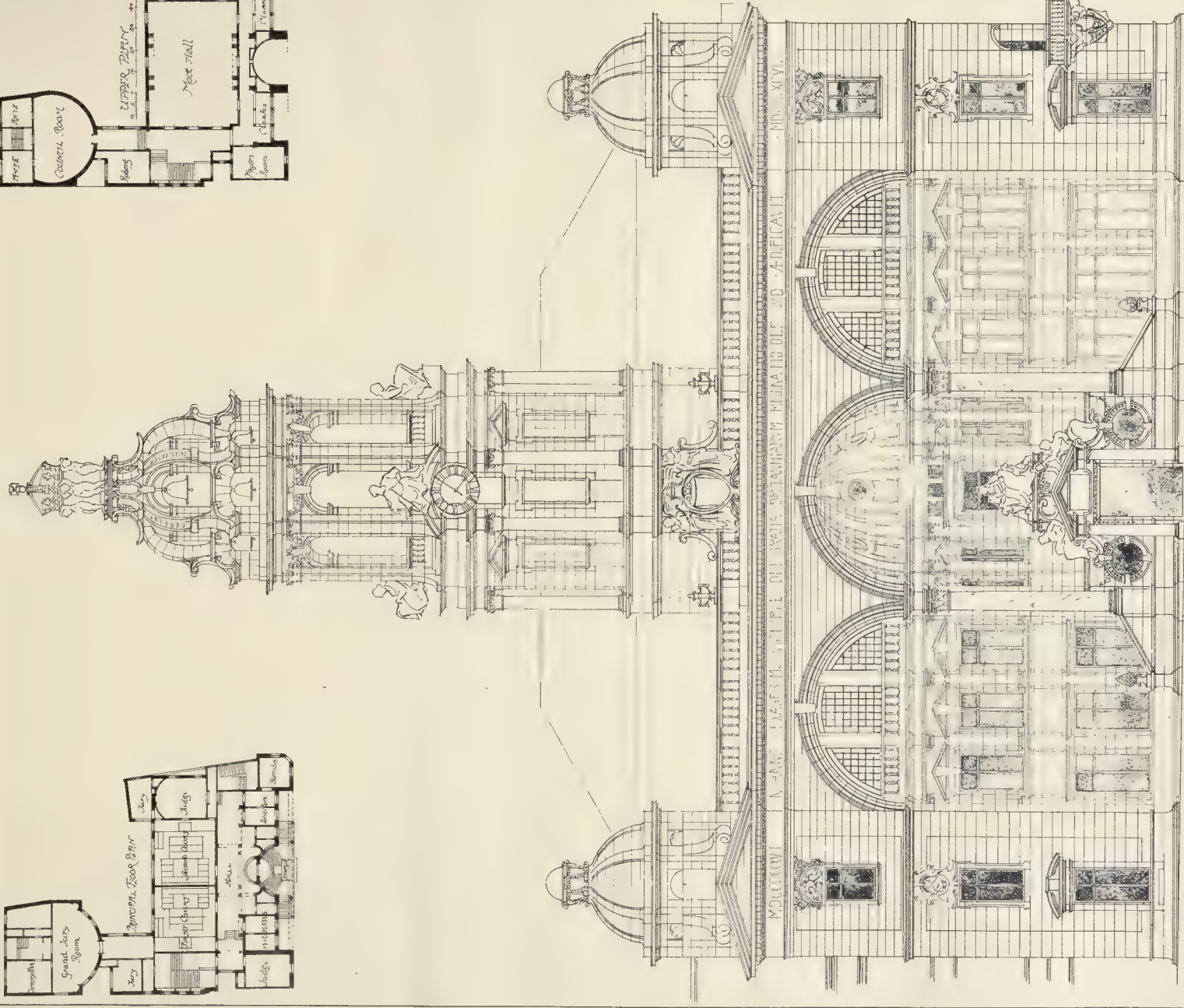
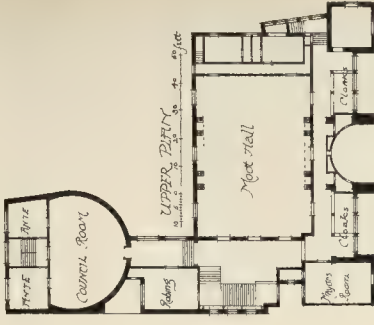
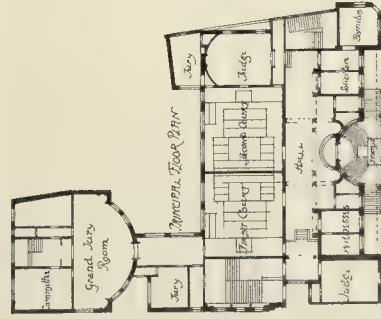


DESIGN FOR PROCESSIONAL  
CROSS FOR S. PAVLS.  
CATHEDRAL.

Designed & drawn by J. H. ...



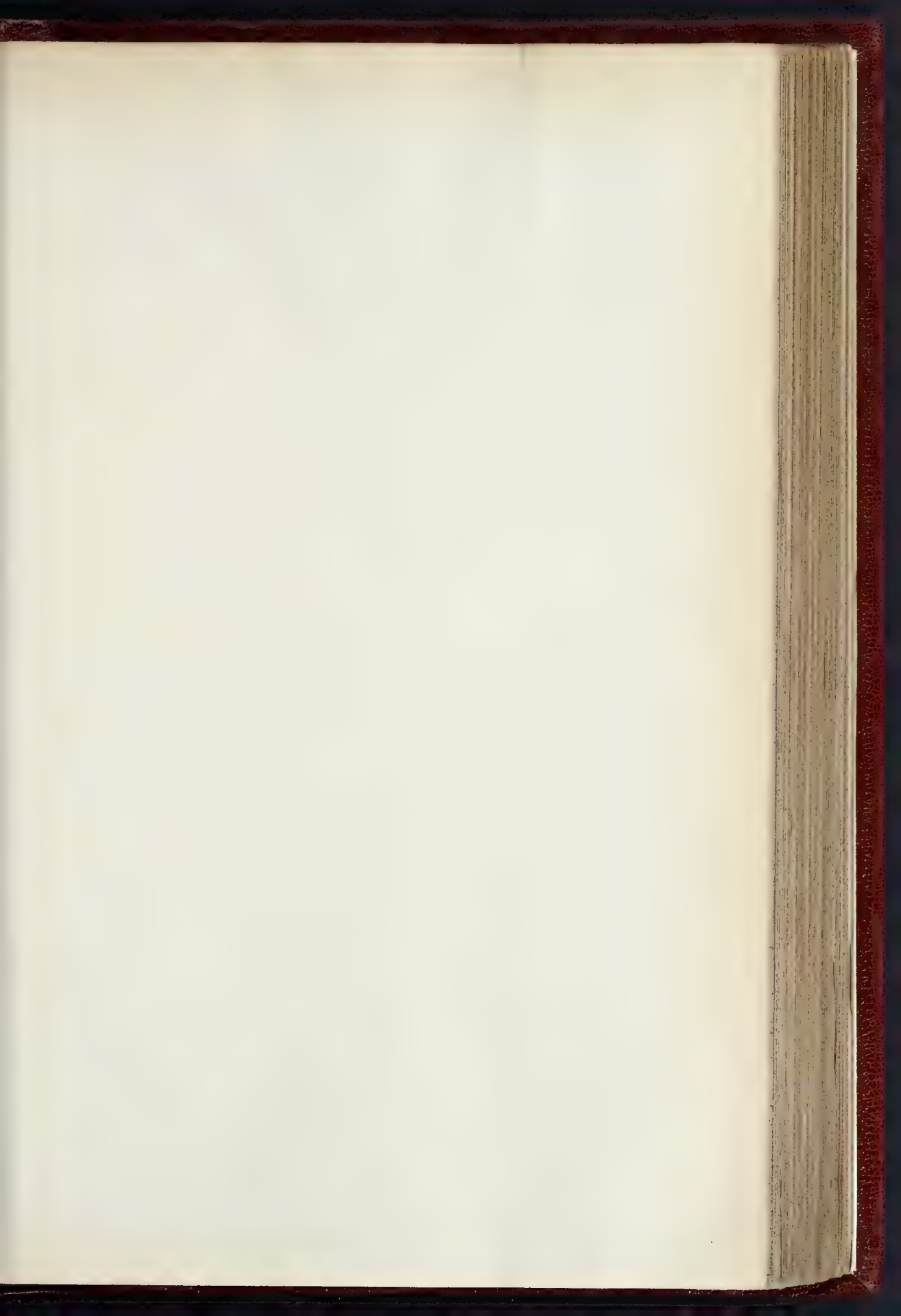




*W. H. R. 1876*





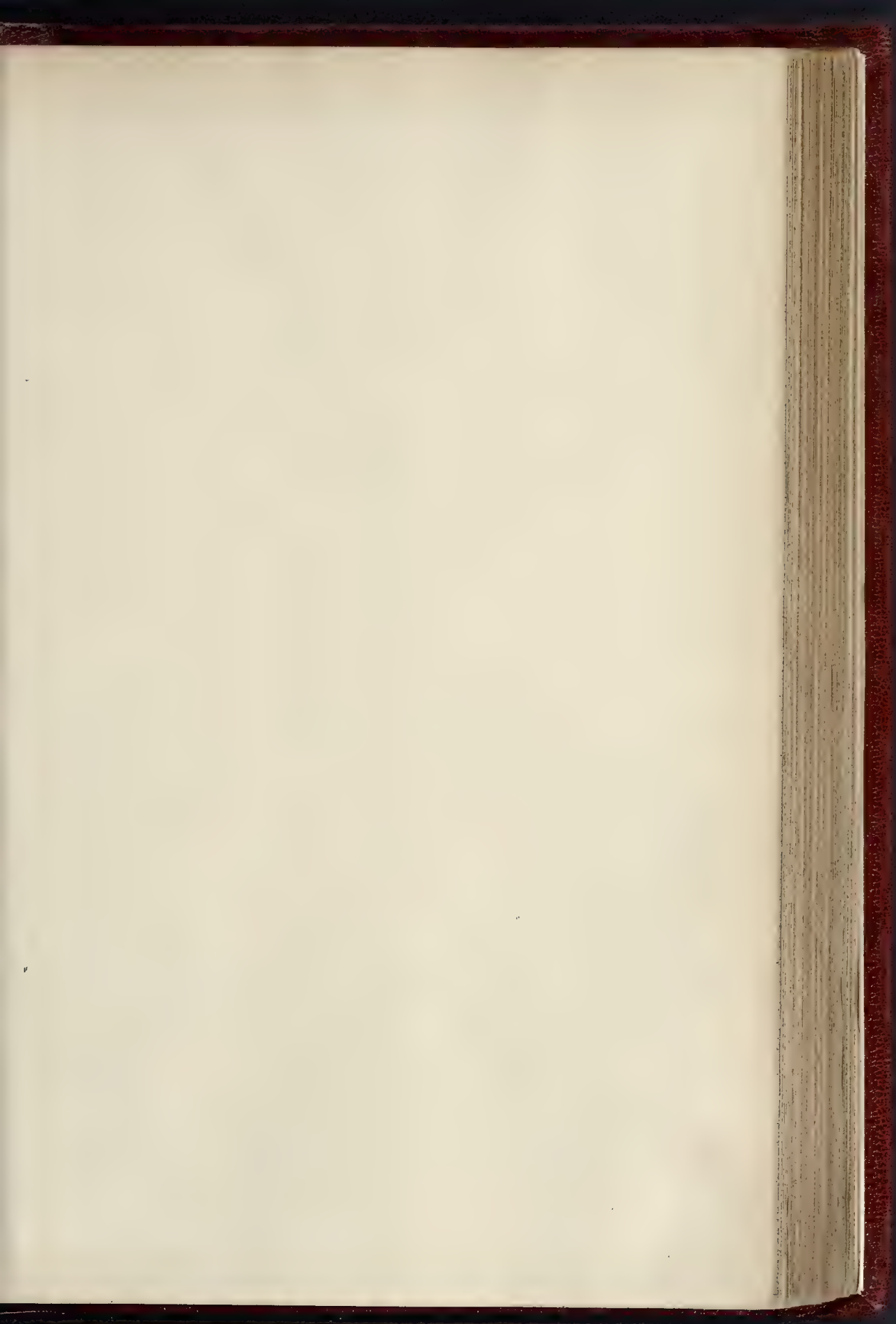


THE BUILDER, OCTOBER 22, 1898



HOSPITAL OF ST. JOHN AND ELIZABETH, ST. JOHN'S WOOD.—MR. E. GOLDIE, ARCHITECT.





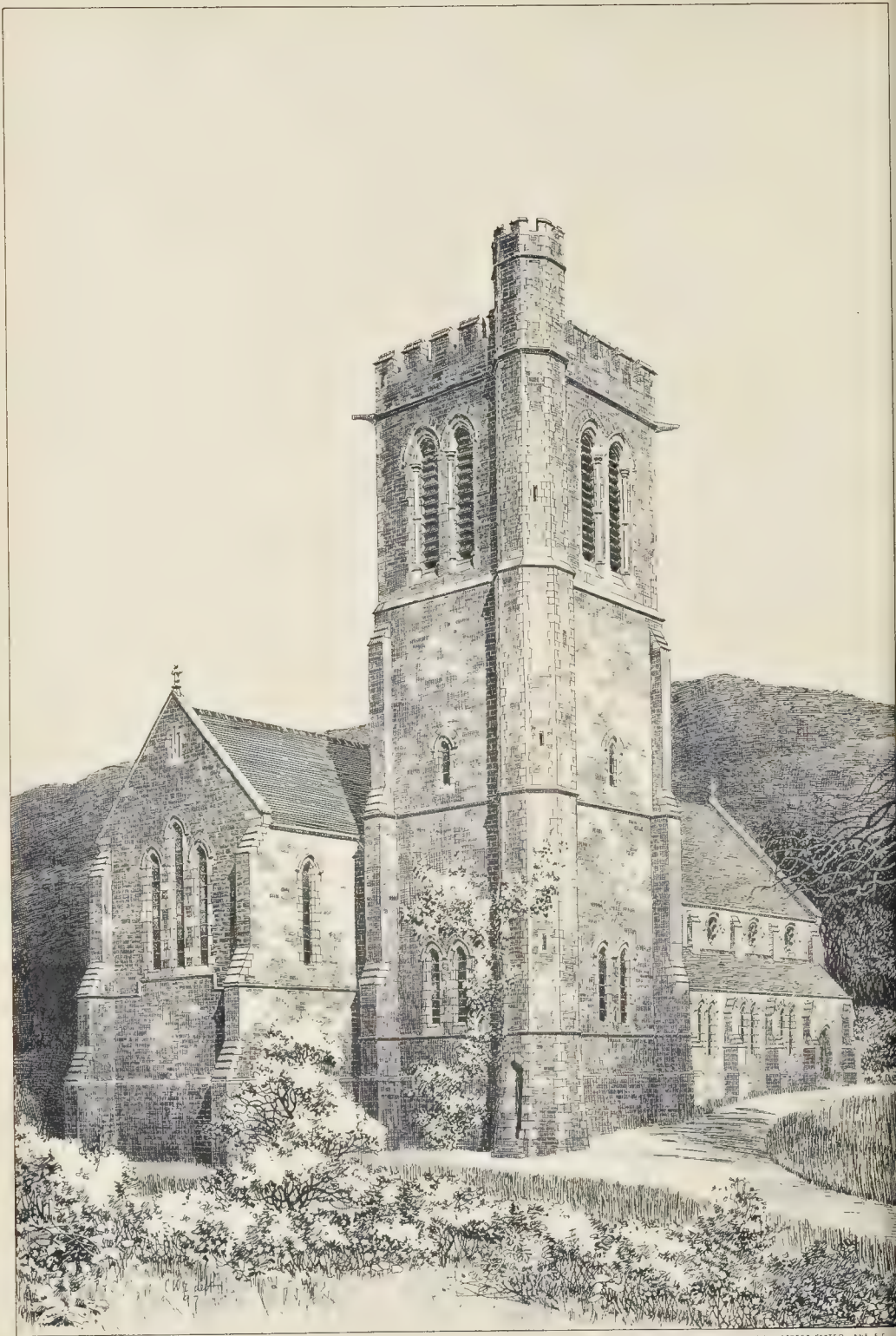
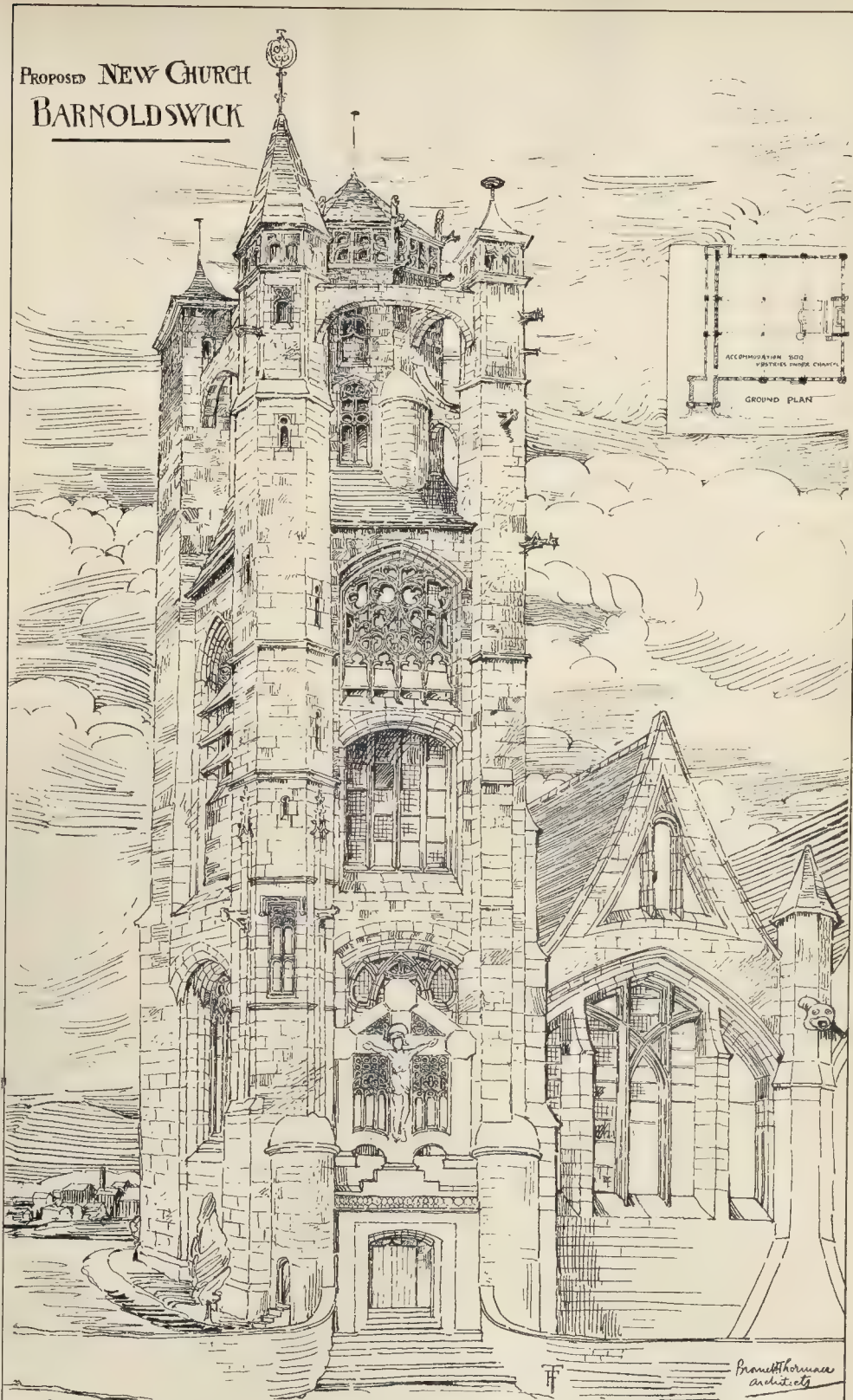


PHOTO LITHO SPRADJE & CO. LONDON. H. & S. EAST HARDY, STREET FETTER LANE, E.C.

CHURCH OF ST. MICHAEL, LLANGYNWYD. MR. GEORGE E. HALLIDAY F.R.I.B.A., ARCHITECT.



PROPOSED NEW CHURCH  
BARNOLDSWICK









THE STANDARD BUILDINGS, CALCUTTA.—MR F. W. STEVENS, C.I.E., F.R.I.B.A., ARCHITECT.







Hospital of SS. John and Elizabeth, St. John's Wood. Plan.

&c. The galleries and the floors above are supported by cast-iron columns with ornamental brackets, together with steel girders and joists—these in their turn support flat tiles over which is spread concrete, on the top of which is laid an ornamental tiling.

All the cast-iron work was supplied and fixed by Messrs. Burn & Co., of Calcutta. The whole of the bank premises are paved with marble slabs. The teak counters with brass railing were supplied and fixed by Messrs. Weinbridge & Co., of Bombay, and some of the other fittings by Messrs. Lazarus & Co., of Calcutta. There is a fireproof strong-room as well as retiring-rooms on each floor; also accommodation for servants and stabling at the back of the buildings. Over the main entrance to the Standard offices are the Company's arms carved in the white Porebunder stone which has been generally used for ornamental work and dressings throughout the building.

The whole of the decorative carving has been executed by native workmen sent from Bombay, the models and casts of enrichments having been prepared by Mr. Gomes and the students of the Bombay School of Art under the supervision of Mr. Griffiths, the late principal of that Institution.

**ST. PATRICK'S CHURCH, GORTIN, IRELAND.**—The foundation-stone of St. Patrick's, Gortin, was laid recently by the Rev. Dr. O'Doherty, Lord Bishop of Derry. In the new building there will be seating accommodation for three hundred. The nave will terminate in the east side with octagonal apse, and the transepts will be constructed to permit of side chapels. The principal entrance will be from the west front, approached by steps. To the north side will be placed a tower and belfry, with provision for a spire. The windows will be filled with tinted cathedral glass in leaded lights. The total length of the church will be 88 ft., across the nave, 28 ft.; and across the transepts, 58 ft. The belfry will reach a height of 66 ft. Mr. E. J. Toye, C.E., Derry, is the architect of the new building.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

**Battersea.**—Frontage of buildings proposed to be erected by the Vestry of Battersea, in connexion with their central station for the supply of electricity, on a site abutting upon Lombard-road, Holman-road, and Harroway-road (Mr. C. S. Peach for the Vestry of Battersea).—Consent.

**Chelsea.**—An additional story to the bay window in front of No. 38, Elm Park-gardens (Messrs. E. Hayward & Son for Mr. F. L. Govett).—Consent.

**Clapham.**—Four houses erected on the south side of Kyrle-road, Clapham Common, and to the erection of thirty-seven other houses on the same side of that road (Mr. H. N. Dunn for Messrs. J. & R. Bax).—Consent.

**Greenwich.**—Five-story bay-windows erected in front of four blocks of flats on the north side of Cambridge-road, Battersea Park (Mr. W. E. Filditch for Mr. J. R. Ward).—Consent.

**Greenwich.**—One-story shops in front of Nos. 54, 56, 58, 60, 62, and 64, Blackwall-lane, East Greenwich (Mr. W. Busbridge).—Consent.

**Greenwich.**—Twenty-one houses on the north side of Wellington-road, Charlton, with projecting wooden porches and balcony railings over, and with projecting wooden canopy roofs at the first-floor level (Mr. C. Farley).—Consent.

**Hackney, South.**—A urinal erected in the yard of the "Kenton Arms" public-house, abutting upon Kenton-road, Hackney (Messrs. W. D. Church & Kenton-road, Hackney (Forecast)).—Consent.

**Marylebone, West.**—An iron and glass covered way in front of No. 17, Albert-road, Regent's Park (Messrs. Maple & Co., Limited, for Mr. H. Lyne).—Consent.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

**Normood.**—Three one-story shops in Half-moon-lane, Herne-hill, adjacent to the "Half-moon Hotel" (Mr. P. C. Davies for Mr. G. W. Riley).—Consent.

**Poplar.**—A one-story addition in front of a building formerly known as Brunswick Hall, Brunswick-road, Poplar (Mr. R. Plumb, for the chairman and committee of the Poplar Hospital for Accidents).—Consent.

**Leaisham.**—A one-story office-building adjoining Catford railway-station, Ravensbourne Park, Catford-road (Mr. A. Hogwood for Messrs. Brews Brothers).—Refused.

**Dulwich.**—Rebuilding of No. 182, Underhill-road, East Dulwich, with a one-story shop in front to abut also upon Upland-road (Mr. J. A. G. Knight for Mr. G. R. Eurn).—Refused.

**Hammersmith.**—A house on the north side of Uxbridge-road, to flank upon Old Oak-road (Mr. W. H. Wyett).—Refused.

**Islington, North.**—A conservatory on part of the forecourt of No. 9, Hornsey-rise (Mr. H. J. Gentry for Mr. W. Norris).—Refused.

**Normood.**—One-story shops upon part of the forecourts of Nos. 216, 218, and 220, Reilton-road, Herne Hill (Mr. P. C. Davies for Mr. S. S. Death).—Refused.

##### Width of Way.

**Hoxton.**—Rebuilding of No. 74, Rivington-street, Shoreditch, with an addition on the west side of the new premises (Messrs. Gordon, Lowther, & Gunton for Mr. J. Latham).—Consent.

**St. Pancras, South.**—A building on the east side of Wicklow-street, to abut also upon Leake-street, King's Cross (Mr. R. T. Kingham for the London General Omnibus Company, Limited).—Consent.

**Southwark, West.**—A warehouse on the north side of Union-street, to abut also upon Ewer-street and Pump-court (Messrs. F. Chambers & Son for Mr. F. J. Chambers).—Consent.

**Southwark, West.**—A five-story addition at the rear of No. 41, Bennett-street, Stamford-street, to abut upon Bennett's-mews (Messrs. J. D. Matthews & Son for Messrs. Cook, Son, & Co., and signed by the Chairman of the Committee).—Consent.

##### Width of Way, Deviation from Certified Plan, &c.

**Bethnal Green, North-East.**—Rebuilding of Nos. 7 and 9, Russia-lane, Old Ford-road, with one-story

bay-windows in front and a two-story laundry at the rear of No. 5 to abut upon Providence-place; and that the sanction of the Council be given to certain deviations from the plan certified by the District Surveyor (Messrs. H. Dawson & Son, for the Trustees of the Moravian Trust London Estates).—Consent.

#### Open Spaces about Buildings.

**Hackney, North.**—A two-story dwelling-house on the west side of Church-path, Stoke Newington, with an open space at the rear (Mr. H. Brown for Mr. Blake).—Consent.

**Whitechapel.**—A modification of the provisions of the 1894 London Building Act with regard to open spaces about buildings, so far as relates to the proposed erection of two-story additions on part of the open space at the rear of Nos. 115 to 145 (odd numbers only) inclusive, Pelham-street, Mile-end New-town (Mr. R. Langton Cole for the Metropolitan Association for Improving the Dwellings of the Industrial Classes).—Consent.

#### Deviation from Certified Plans.

**Paddington, South.**—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of an addition at the rear of No. 11, Westbourne-grove (Messrs. Clark & Hutchinson for Mr. N. Abrahams).—Consent.

**St. George, Hanover-square.**—Certain deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed re-building of No. 24, Brook-street, Grosvenor-square (Mr. F. W. Ledger for Mr. W. H. May).—Consent.

**Westminster.**—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "Old Red Lion" public-house, No. 48, Parliament-street, at the corner of Derby-street (Messrs. Gardiner & Theobald for Mrs. Smith).—Consent.

#### Line of Fronts and Width of Way.

**Leamington.**—A house with a one-story shop on the north side of Stanstead-road, Catford, to flank upon Stanstead-grove (Mr. A. C. Baker for Mr. W. A. Jewell).—Consent.

**Chelsea.**—A porch, bay-windows, and balconies to a block of proposed residential flats on the north side of Wilbraham-place, Sloane-street, to the corner of D'Oyley-street (Mr. E. Sage for Mr. E. Messiter).—Consent.

**Woolwich.**—A three-story house with shop on a site between Nos. 166 and 170, Plumstead Common-road, Plumstead (Mr. J. Cook for Mr. McDermott).—Refused.

#### Width of Way and Space at Rear, &c.

**Finchbury, Central.**—The rebuilding of the "Coach and Horses" public-house, No. 30, St. John's-square, Clerkenwell (Mr. A. Dixon for Whitbread & Co., Limited).—Refused.

#### Height of Buildings.

**City of London.**—That Mr. A. N. Bromley be informed that his application on behalf of the National Telephone Company, Limited, for the consent of the Council to the erection of new head offices, with oriel windows, on the Victoria-embankment to abut at the rear upon Tallis-street, and flank upon Temple-avenue, and to exceed in height the width of those streets respectively, having been further considered, the Council sees no reason to depart from its decision of July 26, 1898, not to grant the application.—Agreed.

Recommendations marked † are contrary to the view of the Local Authority.

#### BOOKS RECEIVED.

THE PRINCIPLES AND PRACTICE OF MODERN HOUSE CONSTRUCTION. Divisional-Vol. II. Edited by G. Lister Sutcliffe (Blackie & Co.).

FIRE-TESTS WITH UNPROTECTED COLUMNS. A Report by the Committee on "Fire-proofing" Tests, New York (British Fire Prevention Committee).

THE SANITATION OF DOMESTIC BUILDINGS. By Frank Latham, C.E. With introduction by Baldwin Latham, C.E. (The Sanitary Publishing Company).

THE STONES OF VENICE, Vol. II. By John Ruskin, LL.D., D.C.L. New edition in small form (George Allen).

ACCIDENTS TO WORKMEN. A Treatise on the Employers' Liability Act. By R. M. Minton-Seahouse and G. F. Emery. (Erfingham Wilson, and Sweet & Maxwell.)

THE ARCHITECTURE OF THE RENAISSANCE IN ITALY. By W. J. Anderson. Second edition, revised and enlarged. (B. T. Batsford.)

REDRESS BY ARBITRATION. By H. Foulks Lynch, Solicitor. Third edition; revised by D. F. de l'Hoste Ranking. (Erfingham Wilson.)

STUDENTS' COLUMN ARTICLE.—Our Students' Column article (Sound, Light, and Heat) is unavoidably held over until next week.

## Correspondence.

### To the Editor of THE BUILDER.

#### "THE SCARCITY OF WATER."

SIR.—I see by R. T.'s letter in your last issue, that he is anxious to know the methods I propose for effecting a saving in rain water; and in case I should be at a loss, he is kind enough to furnish a scheme out of his own head, which he afterwards proves is impracticable and absurd. In this I entirely agree with him, but the ideas are his and not mine.

All changes, however needful, are attended with difficulties at first; but if on that account everyone feared even to attempt to accomplish them, we should stand still altogether.

I have seen several suburban houses of the description he gives successfully fitted with soft-water cisterns. In most of these houses there is a back addition, containing the scullery, &c. The cistern is placed above the roof of this, and receives the water from the main roof. A pipe is then taken from the bottom of the cistern into the scullery, where there is a soft-water tap, which requires no pump, as "R. T." suggests.

Where there is no back addition, which is very rare, the cistern is placed on timber supports against the wall of the scullery, at such a height that the bottom is above the tap in the scullery. I have lived for nineteen years in a house fitted in this manner, and the only trouble entailed was the periodical cleaning of the cistern, which is equally necessary with hard water. Of course, if the cistern is fitted at the time the house is built it can be arranged so that it collects nearly the whole of the water from the main roof, which is still better.

In large country-houses, which require large storage, underground tanks have been found to be best, as they collect the water from the lower roofs as well; and those that I have seen built are very much appreciated by the owners.

No compulsion is necessary to induce people to use soft water where they can get it. Rain water can never supersede the regular supply; but it aids in preventing an excessive strain on the sources of that supply, and in keeping a reserve for times of drought. Any one who has once experienced the benefit to the skin from using soft water for washing and shaving, especially in cold weather, will not willingly give it up again.

In conclusion, I would say that at Haileybury College, where there are over 500 people, nothing but earth-closets are used, and they are found to be most satisfactory in every way. So, in the country at all events, the saying which "R. T." first mentions, though I fear his figures are not quite correct, might be effected to a large extent.

GUY M. NICHOLSON

#### ROYAL COMMISSION ON SEWAGE TREATMENT.

SIR.—During the past few days the above Commission has been visiting some sewage works in different parts of the country. Now it is well known that Lancashire contains a very large number of towns; in most of them, sewage works (more or less successful) are in operation. I have received certain information which makes me somewhat anxious as to the soundness of the conclusions the Commission may eventually arrive at, and I should like to ask—through you—two questions which someone with more knowledge than I possess may be able to answer.

1. Is it a fact that the Commission has only spent two or three days in Lancashire inspections?
2. Is it a fact that the Commission made most of its visits (few as they are) to towns where very little useful information could be gained, and have kept away from towns where artificial filters (not bacteria ones) have worked most successfully for years without any land treatment?

If the answer to these questions is in the affirmative, I say the Commission will not have all the evidence before them why land treatment is in a very many cases quite unnecessary; and I also fear the bacteria system is unduly pressed upon them, to the exclusion of the oxidising system of filtration, which has done and is doing such good work when intelligently managed.

In conclusion, I may instance the Commission's visits to Manchester Sewage Works. What did the members learn there? Chiefly, I imagine, how a sewage works ought not to be constructed. There is nothing reliable there to help them as to the land question, nor as to the relative merits of the two systems of "filtration" I have named. In this connection I just want to point out what is often overlooked in comparing the two systems. However efficient the bacteria system may be, the cost of an installation is four or five times as great as one with oxidising filters. Moreover, the recent trials at Daveyholme are merely experimental and quite unreliable as yet.

EGAWES.

#### NEWCASTLE ARCHITECTURE.

SIR.—In the illustrations of Newcastle architecture in the *Builder* of October 8, it should have been stated that St. Matthew's Church was designed

by the late Mr. R. J. Johnson, and the church built in his lifetime. The upper stages of the tower and the reredos were erected after Mr. R. J. Johnson's death, but from his designs. In your notes you correctly state that the church was designed by Mr. R. J. Johnson, but this should have been repeated in the illustrations.

It is to be regretted that illustrations of Mr. Johnson's beautiful screen work and reredos in St. Nicholas Church, erected when it became the cathedral of the diocese, could not have been included in the illustrations.

Mr. Johnson's work gives a note of distinction and refinement to the architecture of Newcastle which is wanting in many of our large towns. As a former pupil of Mr. Johnson I ask you to publish these corrections, which are due to his memory.

F. THOMAS.

#### A MODEL OF STONEHENGE.

SIR.—If you will kindly refer to the *Builder* of August 11, 1890, you will see a statement to the effect that a Mr. Browne made and presented a model of Stonehenge to the Trustees of the British Museum, and that the model was deposited in the Museum.

On Monday, October 4, I inquired at the Museum after this model, and Mr. Reid, chief of the department, assured me that there was no model of Stonehenge in the Museum. He very much wished there was.

Now, surely the Editor never could have made such a statement as appears on the paper without some grounds.

Perhaps if you would either publish this note, or make inquiry, some information could be obtained, and the statement either confirmed or contradicted.

CHARLES I. RUSSELL, Retired Surveyor,  
Royal Engineering Civil Staff.

\* \* On referring to the Volume of the *Builder* for 1849 we find, as we expected, that the Editor never made any such statement. He quoted, in a footnote, a passage from a paper of the day, *The Journal*, giving an account of the Mr. Browne referred to having made a model of Stonehenge and having taken it to the British Museum. The statement seems to have been inaccurate, but it was not given on his authority. A good many correspondents do not seem able to distinguish properly between a statement made editorially in a paper, and a quotation or a report of a speech or lecture.—ED.

#### FIRE-BRICKS.

SIR.—Can any of your readers give me the name and address of the maker of fire-bricks marked "M. T. C."?  
A. DOVASTON.

#### OBITUARY.

MR. GLEESON WHITE.—We regret very much to have to record the unexpected death of Mr. Gleeson White, the first editor of *The Studio*, and whose name and influence, through his decorative designs and his writings, were very much associated with what may be called the new school of book illustrators and decorative designers. With that school, which we should be somewhat disposed to call "the eccentric school," we are not very much in sympathy; but Mr. Gleeson White was both a gifted and a genial man, and a genuine enthusiast, and his loss will be much felt.

MR. JAMES YOUNG.—The death has just occurred of Mr. James Young, of the firm of James Young & Sons, railway and public work contractors, Edinburgh. The deceased, who was born at Shotts in March, 1860, was educated at the Glasgow High School, and joined his father and his elder brother Robert in the business of contractors. His father, who had started the firm fifty years ago, died in 1886. Since then the business has been carried on under the management of the two brothers. The firm has in its employment at present in various parts of Scotland on different railway and public works contract over 3,000 men. The Messrs. Young have for a number of years past done all the principal work in connexion with the various undertakings of the Edinburgh and District Water Trustees, &c. at present they are engaged in the construction of the Talla Reservoir.—*Scotsman*.

MR. T. FULLER.—Mr. Thomas Fuller, late chief architect of the Dominion Department of Public Works, died at Ottawa on September 28, aged 76. Mr. Fuller was born in Bath, England, and went to Canada in 1857. In 1859, in the competition for the Parliament and Departmental buildings at Ottawa, his design for the Parliament building was adopted, and he was awarded second premium for his designs for Departmental buildings, which included a residence for the Governor-General. Mr. Fuller superintended the erection of the Parliament buildings. In 1881 he was appointed chief architect of the Public Works Department.

CONSTITUTIONAL CLUB, WORKING.—The new District Constitutional Club for Woking, which is Renaissance in character, has been erected from the designs of Mr. H. A. Whitburn, of Woking, by Messrs. J. Harris & Son, the amount of whose tender was 2,227l. The front is of red brick, with stone dressings.



## GENERAL BUILDING NEWS.

## RESTORATION OF MACCLESFIELD PARISH CHURCH.

The foundation-stone of the restored parish church of St. Michael, Macclesfield, was laid on the 5th inst. by the Duke of Devonshire. The oldest portions of the church are the tower and the Legh and Savage chapels, so named after two ancient Macclesfield families. The tower will retain its characteristic features, and will simply be refaced with new stone. The two chapels alluded to are both eventually to be restored, the former to be furnished as a baptistry, and the latter to be formed into a morning chapel. The remainder of the church is to be practically rebuilt, the cost of the work (which is to be carried out under the direction of Sir Arthur Blomfield, A.R.A.) being estimated at something like 17,000l.

**CHURCH, PORT CLARENCE, DURHAM.**—The foundation stone of a new Catholic church (St. Thomas) was laid on the 14th inst. The church will be in the Gothic style, the architects being Messrs. Pugin & Pugin, and the builders Messrs. Bastiman Bros. It will be 112 ft. long, 43 ft. in width, and will, when completed, be capable of accommodating 550 people. The exterior of the church will be of Accrington iron bricks, and the dressings will be of sandstone, whilst the interior walls will be of stone.

**CATHOLIC CHURCH, BALLYMONEY, BELFAST.**—The new Church of the Most Holy Rosary, Ballymoneigh, has just been dedicated. One of the features of the building will be the marble high altar by Messrs. Hardman & Co., Birmingham. The communion rails are also of marble. The floor of the church is in ceramic mosaic work, after designs similar to those on the floor of the tabernacle, this portion of the contract being entrusted to the firm of De Grelle, Houdret, & Co., London. The flooring of the porch and passages is terrazo pavement, the work being done by the same firm. The confessionals are set in niches in the walls specially oak, relieved by panels of American walnut. The sanctuary windows forming the background to the high altar are of stained glass, the subjects being the mysteries of the Rosary. The window over the Sacred Heart altar is also in stained glass. The glazing of the windows has been entrusted to the firm of Messrs. Campbell & Clokey, of Belfast. When completed the spire will rise to a height of 116 ft. The architects are Messrs. J. J. O'Shea and E. & J. Byrne, the contractors being Messrs. H. & J. Martin.

**ST. NINIAN'S CHURCH, MILE-END, ABERDEEN.**—The foundation-stone of the new church at Mile-End, Aberdeen, was laid on the 12th inst. The church is to be erected at a cost of 6,000l., exclusive of the hall which forms part of the scheme, but which it is not intended to proceed with at once. The architect is Mr. William Kelly.

**NEW CHURCH OF KILMATTIGUE, CO. SLIGO.**—On the 2nd inst. the new church of Kilmattigue was dedicated by the Bishop of Achonry. The new church consists of two transepts and chancel. In length it is about 100 ft., and the breadth is about 33 ft. The gable is surmounted by Celtic crosses. Mr. W. H. Byrne was the architect.

**CONGREGATIONAL CHURCH, BELFAST.**—The Clifton Park, Belfast, Congregational Church was reopened on the 9th inst., having been reconstructed and enlarged. The architects were Messrs. J. J. Phillips & Son, of Belfast. The contractor was Mr. James Kidd.

**CONGREGATIONAL CHURCH, WREXHAM.**—On the 2nd inst. the new church buildings erected in Salisbury Park, Wrexham, for the Penybryn Congregational Church, were opened. The principal entrance to the church, which seats 600, is from Salisbury-road, by a porch and lobbies. The whole of the buildings are of Gothic design, faced with Ruabon (terra cotta) brick and stone dressings. Messrs. Ingall & Son were the architects, and Messrs. Lewis Brothers, Wrexham, the contractors.

**BAPTIST CHURCH, BAROED.**—The foundation-stone of a new English Baptist Church for Baroed was laid on the 3rd inst. The structure, of which Mr. D. Morgan is the architect, will cost 800l.

**PARK U.P. CHURCH, DUNDEE.**—The memorial stone of Park United Presbyterian Church, which is being built in Park Avenue, Dundee, was laid recently. The plans for the church were prepared by Mr. Leslie Over (of Messrs. C. & L. Over, architects, Dundee). The church, in which accommodation will be provided for 750 worshippers, occupies a site at the junction of Park Avenue and Morgan-street. The contractors for the work are—Builder, Mr. William Bennet; joiners, Messrs. J. F. Shaw & Son; plumbers, Messrs. Mitchell & Son, Dundee; slater, Mr. William Brann, Arbroath; plasterers, Messrs. Reoch & Kilgour, Dundee; glaziers, Messrs. Lindsay & Scott; and heating, Mr. David Keay. Mr. Charles Gourlay, of Messrs. C. & L. Over, is acting as assistant in charge of the work.

**CONGREGATIONAL CHURCH, HARWICH.**—This church was re-opened on Sunday last, after having been recreated and redecorated, a new rostrum provided, and considerable alterations carried out. Mr. E. Saunders, of Dover, has carried out the whole of the work. All the joinery has been executed in pitch-pine, and the benches are of the same material. The decorative portion of the work was executed by Mr. J. A. Saunders, of

Dovercourt, and the scrolls to altar rail, staircase, gallery rail, and other wrought-iron work, by Messrs. Carter & Aynsley, of Bishopsgate-street. The architect was Mr. J. W. Start, of Colchester and Harwich.

**GREYFRIARS CHURCH, EDINBURGH.**—This old church has been opened again after painting and decorating, the introduction of the electric light, and other improvements. Messrs. J. & T. Harvey have carried out the scheme of decoration. The electric Stained glass has been put into the side windows of the gable, but the memorial glass for the large centre window is still in the hands of Messrs. Ballantine & Gardner, and will be erected shortly. Messrs. Hardy & Wight were the architects.

**CHURCH, SMALL HEATH, BIRMINGHAM.**—On the 8th inst. a new Unitarian church was opened in the Waverley-road, Small Heath. The structure, which was built from the plans of Messrs. J. A. Grew and H. S. Eachus, is of Gothic design. Internally it extends 90 ft.; the width of the nave is 28 ft., and of the aisle about 8 ft. There is seating accommodation for 400 people. There is a vestry at the rear, hoped in a short time to complete the building by the addition of a tower and spire, and the erection of schools.

**CATHOLIC SCHOOLS, NEWPORT, MONMOUTHSHIRE.**—A new Roman Catholic infant school, Newport, was opened on the 12th inst. The school, which was erected from designs by Mr. F. R. Bates, architect, will accommodate 38 children. The work was carried out by Mr. C. West, contractor.

**CATHOLIC SCHOOLS, DURHAM.**—On the 13th inst. the Mayor of Durham (Col. Rowlandson) opened the new Catholic schools which have been erected at the obtuse angle formed by the junction of Framwellgate and Castle Chare. They have been built from the designs of Mr. Charles Walker, of Newcastle-on-Tyne, and have been executed by Mr. Francis Caldegrave, contractor, of Durham. The accommodation in the schools is for about 600, and includes girls' and boys' departments up-stairs, and infants' departments downstairs, cookery-room with scullery and entrance and cloak-room. The total cost of the building has been about 5,000l., including the cost of the site.

**SUNDAY SCHOOLS, LINCOLN.**—The new Sunday-schools of the Bailgate Wesley Chapel were opened on the 12th inst. The architects are Messrs. W. Mortimer & Son, and the contractors Messrs. Halkes Bros.

**SCHOOL, BRIDGE OF WEIR, N.B.**—At a meeting of the Kilbarchan School Board on the 7th inst., the clerk intimated that the following were the successful tenderers for the erection of the new school at Bridge of Weir, viz.:—Building and mason work, Mr. Robert Houston, Bridge of Weir; carpenter and joiner work, Mr. J. Colquhoun, Bridge of Weir; plaster work, Messrs. George Thomson & Son, Johnstone; plumber and gasfitting work, Mr. John Crawford, Bridge of Weir; tile work, Messrs. Kean & Wardrop, Glasgow. Mr. Andrew Purdon, Kilbarchan was appointed master of works. The architect of the new school, which is estimated to cost 4,500l., is Mr. James Millar, Glasgow, who was successful in competition.

**ST. OLAVE'S UNION NEW OFFICES, TOOLEY-STREET.**—A building is in course of erection in Tooley-street for the St. Olave's Union. The architects are Messrs. Newman & Newman. The union offices, forming the front portion of the building, and entered from Tooley-street, although communicating, are shut off from the rest of the building and dispensary at the back. Upon the ground floor is provided the registrar's private and general office, also offices for the general relieving officer and collector, with porter's box and the necessary waiting rooms, &c. Approached by the main central staircase is the first floor, upon which are provided the clerk's general and private offices and strong room, committee-room, waiting-rooms, and offices, and at the back the Board-room, 50 ft. by 30 ft., with access for reporters, gentlemen and ladies' retiring-rooms, and back staircase. The second floor, in roof, will be fitted up as a store for books, stationery, &c. In the basement will be situated the storerooms. Passing through the doors at the side of the main stairs or by the main entrance in Shad Thames, the relief station is entered. In the centre and under the board-room is the large general waiting-room, with two relief committee-rooms, and on each side the necessary number of rooms for medical officers and relieving officers. Upon the right hand is the dispensary and vaccination station, with consulting-room, and over the dispensary the rooms for the caretaker. The exterior of the building is faced with red brick, with red Dumfries stone dressing. Mr. J. Bullers, of Bermondsey, is the contractor, and the cost of the building will be 20,000l.

**NEW BANK BUILDINGS, NORTH BRIDGE-STREET, EDINBURGH.**—These buildings will be situated on the east side of North Bridge-street, with frontages to both that street and High-street. The plans show buildings five stories high and measuring about 100 ft. from the pavement to the ridge of the roof. The bank office is placed at the end next North Bridge-street, and has an entrance at the corner of the two streets. The banking room is 30 ft. square and 18 ft. high, and will be lined entirely with coloured

tiles. It is lighted by three large windows—two looking out on North Bridge-street and one on High-street. At the back of the banking room is a private room for the agent, and a stair leads down to a basement. Beyond the bank are three shops entering off High-street, and beyond the shops is an open archway leading to the lane behind. The architects of the building, which will cost about 15,000l., are Messrs. Sydney Mitchell & Wilson.

**MASONIC AND VOLUNTEER HALLS, LEVEN, N.B.**—The foundation stone was laid, on the 8th inst., of these buildings. The dimensions of the building are 76 ft. by 32 ft., and it is two stories high. The armoury and reading-room are at the back. A drill hall, 66 ft. by 20½ ft., occupies the ground floor. The Masonic Hall is 47 ft. by 29½ ft. Messrs. A. & A. C. Dewar are the architects.

**LIBERAL CLUB, SOUTHPORT.**—On the 8th inst. the foundation stones of a new Liberal Club were laid at the corner of Devonshire-road and Dawson-street, High Park, Southport. The club will contain reading, committee, smoke, library, and billiard rooms, and an assembly-room. There will be a caretaker's cottage alongside, and altogether the cost will be about 1,000l. Councillor R. Todd is the architect, and Mr. J. Sawyer the contractor.

**ST. ALDHELM'S HOME, FROME.**—St. Aldhelm's Home for Boys at Frome was opened by the Bishop of Bath and Wells on the 4th inst. The Home was erected from plans prepared by Mr. C. S. Peach, of London, and Mr. William Pain, of London, the contractor being Mr. C. Barnes, of Frome.

**RE-MODELLING OF WESTHULME HOSPITAL, OLDHAM.**—The work of re-modelling Westhulme Hospital by constructing buildings to replace the old wooden sheds has now been completed from the designs of Messrs. Heywood & Ogden, architects, Oldham. The ward block provides for forty beds, and there are also an isolation block, laundry, entrance buildings, and an extension of the administrative building.

**FLATS, HOVE.**—A block of flats is to be erected on the St. Aubyn's estate, Hove, facing the sea and having a frontage to the new Medina Esplanade. The plans have been prepared by Messrs. Lainson & Son, architects, of Brighton, with the assistance and co-operation of Messrs. Rolfe & Matthews.

**BUSINESS PREMISES, ABERDEEN.**—The plans of the buildings for the Bon-Accord Ice and Cold Storage Company, as prepared by Mr. George Coutts, architect, Aberdeen, have been approved by the directors of the company. The buildings have a frontage to Poynerock-road of 131 ft. On the west they stretch along Russell-road for a distance of 165 ft., and on the east and south they are shut in by fish-curing yards.

**NEW CATTLE LAIRAGE AT THE MARKETS, BELFAST.**—An addition to the Cattle Market, Belfast, has just been completed. The addition consists of lairage for the accommodation of 300 or 400 cattle, and is situated in the centre of the Cattle Market. The work was carried out by the Surveyor's Department, under the superintendence of Mr. James Munce, Assistant City Surveyor, with Mr. Byers as clerk of works.

**NEW UNION OFFICES, SWANSEA.**—The foundation-stone was laid recently of the new offices for the Swansea Board of Guardians in Alexandra-road. The building is to be constructed of red brick with Bath stone dressings. The site is the corner piece of ground fronting Pleasant-street, and lying beneath Clifton-road. The plans were prepared by Mr. H. W. Wills, and the contract was let to Messrs. Lloyd Bros. for 6,500l.

**CONSTITUTIONAL CLUB, HAWICK, N.B.**—The premises of the Hawick Constitutional Club, erected at a cost of between 3,000l. and 4,000l., have just been opened. The premises are situated in Fourtree-place, having a frontage of 93 ft. there and 78 ft. to the side street. The front portion is in two floors; the back portion is only one story and contains a billiard-room with six tables. There is a large hall with committee and card rooms to the left and other rooms on the right. A staircase leads to the first floor, where there is the reading-room and lecture hall. The architect is Mr. James P. Allison, Hawick.

**NEW ELECTRIC LIGHTING STATION, BELFAST.**—This building, which the Corporation found it necessary to erect owing to the inadequacy of the original premises to supply the increasing demand for electric current in Belfast, is now completed, and was opened on the 18th inst. by the Lord-Lieutenant. The new station occupies a position at the corner of East Bridge-street and Lagan Bank-road. The ground floor is occupied by the engine-house, boiler-house, with space for economisers, coal bunkers, pump house, &c., battery room, men's mess room, timekeeper's room, and men's lavatory accommodation. The engine room, a special feature of the establishment, is very spacious and lofty, being 200 ft. by 40 ft., and has its walls lined throughout with coloured glazed bricks. On the first floor are the drawing, general, and private offices for the various officials, with strong room, engineers' room, store room, sample room, meter-testing and meter-store rooms, superintendent's room, and lavatory accommodation. The second floor is arranged as a residential flat for the engineer-in-charge, consisting of a large suite of bed and sitting-rooms, with bath, lavatory, kitchen, &c. The principal façade, which is towards East Bridge-street, along which it extends for about 225 ft., is effectively treated in



red brick and Giffnock stone in the style of the English Renaissance. The principal entrance, which is not yet completed, will be from East Bridge-street. The chimney has been given a decorative character, the red brick being relieved with courses of artificial stone, with a cornice and mouldings of the same material. The height is 180 ft., and the base 26 ft. 6 in. It is carried on 124 round timber piles. The various departments of the establishment have been so arranged that they can be duplicated should the public requirements necessitate an increase in the accommodation. The contract for the building was secured by the contractors on July 1, 1897, and the whole building has been completed in a little over twelve months. The piling of the building, a separate contract, was done by the same contractors. The 1,190 piles were driven in thirty-seven days, or an average of thirty-two piles per day. The constructional ironwork was supplied by Mr. James McMillan, Glasgow, through his Belfast agents, Messrs. Scott & Rea, and the castings by Messrs. Stephen Cotton & Co., Belfast. The plumbing work has been done by Mr. Harrison McCloy, and the painting by Messrs. George Morrow & Son. All the work was carried on under the immediate superintendence of the clerk of works, Mr. James Moore. The architects for the work were Messrs. Graeme-Watt & Tulloch, and the contractors for the entire work Messrs. J. & W. Stewart.

**NEW MANUFACTURING WORKS.** FOR MESSRS. CHUBB & SON.—Sir G. H. Chubb laid the foundation stone on the 10th inst. of new lock manufacturing works which are being erected at Wolverhampton for the firm of Messrs. Chubb & Son, of London. The occasion was also the eightieth anniversary of the founding of the business. The new works are near to the London and North-Western railway station. The site was purchased from the Corporation; the buildings, which are being erected from the plans of Mr. C. H. M. Mileham, of Lincoln's Inn-fields (Mr. F. T. Beck, of Wolverhampton, acting with him as local superintending architect), will form frontages to four thoroughfares. The superficial area of the workshops, &c., will be about 20,000 sq. ft., and over 300 windows are provided for. The superstructure will be of brickwork, with Darley Dale stone dressings; the steps, door sills, and stairs being of Portland stone. Tipton bricks are used for the general work, with King's Shourbridge red brick facings to the main buildings; the interior of the vestibule above, however, and offices having a dado of Raddon glazed bricks with Stanley's buff brick facings above. The paving of the basement rooms will be of Val de Travers asphalt laid on concrete; the show-room and ground floor offices will be paved with Duffy's pitch-pine blocks; the floors of the workshops will be of deal, 3 in. thick. Every story will be provided with washing and lavatory accommodation, and a large dining-hall or mess-room, with kitchen attached, will be provided. External iron stairs are arranged from the upper floors. On the ground floor the principle entrance is at the angle of Railway-street and Chubb-street into a hexagonal vestibule leading to the show-room, the manager's and clerks' offices, packing and store-rooms for finished goods. The central courtyard is entered by a cartway from Chubb-street, and from this are approached the general store-rooms for materials (of which there is one on each floor except the fourth), the key-fitting room, smithy, engine-room, machine shop, about 44 ft. by 30 ft., asphalt, coal and breeze store, iron stores, and a staircase leading to the upper floors. The timekeeper's room is placed between the cartway (by which also the workmen enter) and the vestibule, so as to have command of both entrances. Additional storage is also provided in a basement beneath a portion of the buildings at the angle of Railway-street and Long-street. Mr. H. Gough, of Wolverhampton, is the builder.

**NEW FEVER HOSPITALS, LEEDS.**—The new fever hospitals erected by the Leeds Corporation at Manston, at a cost of about 40,000l., were opened on the 1st inst. The site, which is some ninety-eight acres in extent, is about three miles from the city. Entering the hospital grounds by the principal entrance from the Tadcaster-road, immediately on the left is the porter's lodge, and on the right the mortuary. Some little distance along the drive and on the left is the mansion, to which have been added offices for clerk, a waiting-room for patients' friends, store-rooms, servants' mess-room, and the hospital kitchen. Directly opposite the mansion, looking west, and some 400 ft. distant, are four double pavilions, the three farther of which are for the treatment of scarlet fever, the nearest being intended as a temporary nurses' home. The pavilions are arranged in diamond form, their long axes running almost directly north and south, with a distance of 124 ft. clear between the east and west pavilions, and 230 ft. between the north and south pavilions. The four pavilions are connected with the administrative block and the laundry by an open covered corridor, broken at intervals to allow an ambulance drive to pass completely round each pavilion. At the north-west corner of the hospital grounds are the laundry, boiler and engine houses, disinfectant and disinfecting-rooms, and near them a small isolation pavilion for six patients. On the east side of the estate and mansion (some 812 ft. distant from the mansion) are two pavilions for the treatment of persons suffering from smallpox. One of these is a

permanent brick structure, the other a wooden temporary erection, each having its own administrative building. At a short distance away is a mortuary and a laundry. There are three pavilions for scarlet fever, each being one story in height, and the greatest axes nearly north and south. Each pavilion contains twenty-two beds, having two wards of ten beds, out of each of which opens a small ward of one bed for a private patient or isolation purposes. On arrival, the patient is admitted into a little lobby, attached to which is a small waiting-room. These are in a separate building on the east side of the main block. This annex also contains a store-room for patients' clothing, a food store-room, a brush-room, and a coal store. It is connected by a covered corridor with open sides, with a larger lobby in the pavilion proper. From each side of this larger lobby a door leads to one or other of the principal wards already mentioned, and from the side remote from the entrance another door admits into the ward kitchen. This latter room has a large window on its farther west side, and two small windows looking into the two private wards. There are also two doors leading from this room to the two large wards. In each private, or isolation, ward there are, besides the doorway into the main ward, two windows to the outside, and a fixed window into the ward kitchen, and a fireplace. The two main wards are each 65 ft. long by 25 ft. wide. Accommodation is provided in the new premises for 66 scarlet fever patients, 58 smallpox cases, and 6 isolation cases, a total of 130.

The various contracts have been carried out by the following firms:—Electricity, Messrs. W. & J. Underwood; work, Messrs. Wm. Irwin & Co., Leeds; plumbing work, Messrs. W. C. & C. Barrand, Leeds; slating, &c., Messrs. Atkinson, Leeds; painting, Mr. J. Robinson, Mr. A. Bateman, and Messrs. Grisdale, all of Leeds; plastering and tiling, Messrs. A. and S. Wheatley, Calverley, Leeds; hot-water apparatus, Messrs. Dargue, Griffiths & Co., Manchester; steam cooking apparatus, Messrs. Davis & Co., London; covered ways, Messrs. Sloan & Davidson, Leeds; fence stoves, the Leeds Fire-clay Company; ranges, gas cooking stoves, &c., Messrs. Dixon & Co. and Messrs. Hurst & Leach, Leeds; boilers, Messrs. Clayton, Son, & Co., Hunslet, Leeds; disinfecting apparatus, Messrs. DeLia & Co., Houndstitch, London; smith and founder's work, Mr. Wm. Horsfall, Leeds; entrance gates and hot water system for smallpox pavilion, Messrs. T. Green & Son, Leeds; roads, sewers, gas and water mains, Leeds Corporation. Mr. E. Bell has acted as clerk of works, and the City Engineer, who prepared the plans for the hospital, has been represented by Mr. E. B. Martin.

**A NEW ARCADE FOR BIRMINGHAM.**—Another arcade is to be built in Birmingham, between New-street and High-street, independently of the one already projected by the City Arcades Company in connexion with their scheme for erecting an arcade between Corporation-street and High-street. The plans, prepared by Messrs. B. Essex, Nicol, & Good, provide for the construction of an arcade from New-street to the Louvre, in High-street, and joining at right angles the arcade about to be commenced by the City Arcades Company, between High-street and Corporation-street. Under the new scheme there will be three shops from New-street, with entrance to a professional and other street, with entrance to professional and other street, which are to be ranges of offices and show-rooms. Provision has been made for a large cafe underneath the whole of the front block of buildings, with entrance from the arcade and a staircase down from one of the New-street shops. The arcade is to be three stories in height. The arcade passage is to be repeated in the basement as a kind of lower arcade, the shop-fronts in the upper portion being continued downwards, while narrow openings in front, protected by ornamental iron rails, will enable the goods exposed in the show-rooms to be seen from the upper passage. In order that as much daylight as possible may be admitted to the basement, the floor of the upper passage will be formed of glass prisms and the basement shops will also be lighted at the rear by skylights. The first section of the City Arcades contract is only from High-street to about half way towards Union Passage, but as the Louvre Arcade is expected to be constructed at the same time, there will be a complete arcade joining the New-street with High-street in the shape of the letter L. The total cost of the new arcade is roughly estimated at 25,000l.—*Birmingham Post.*

**PUBLIC BATHS, TUNBRIDGE WELLS.**—New swimming-baths were opened on the 5th inst. in Monsoon-road, Tunbridge Wells. The accommodation provided in the baths is as follows:—Ladies' department, two first and two second-class slipper baths; Gentlemen's department, four first and six second-class slipper baths. The swimming-bath has a water area of 90 ft. by 35 ft., and is 6 ft. 6 in. deep at the deep end and 3 ft. 6 in. at the shallow end. The bath is formed of concrete, with walls lined with white glazed bricks, and bottom paved with white marble mosaic. The bath-room itself is 105 ft. long by 53 ft. wide. The walls, for a height of 8 ft., are lined with cream glazed bricks, with chocolate bands, and above that level with red bricks. The footways are all of coloured marble mosaic. The roof, which is 55 ft. span, and 40 ft.

high, from floor to apex of lantern, was constructed by Messrs. Main, of Glasgow. The dressing boxes, of which there are fifty, are of pitch pine, and over them is a gallery capable of holding 400 spectators. There is a gallery capable of holding 400 spectators. Mr. W. Mellor (Borough Surveyor) has been the architect of the new baths. Subways give access to all pipes and drains. The electric light from the borough works supply will be used in all departments of the baths, which have cost 10,000l. Messrs. Longley & Co., of Crawley, were the contractors, and Messrs. Bradford, of Salford, have done the engineering work.

**CREIGHTON MEMORIAL, CARLISLE.**—On the 6th inst. the Right Hon. the Speaker of the House of Commons unveiled the monument which has been erected at Carlisle, in a suburb at the south end of Eden Bridge, in memory of the late Mr. J. R. Creighton. The monument is a column of Portland stone, about 32 ft. in height. It stands on a base formed of steps of Portland stone, approached by steps of Lazonby stone, and consists of a trilateral pedestal and cylindrical shaft surmounted by a figure of St. George and the Dragon. On one of the faces of the pedestal is a bronze medallion portrait of the late Mr. J. R. Creighton, as designed by Mr. C. J. Ferguson, Carlisle, and executed by Messrs. Farmer & Brindley, London. The artist who modelled the medallion was Mr. L. Chavalland, London.

## SANITARY AND ENGINEERING NEWS.

**STREET IMPROVEMENTS, LEICESTER.**—Colonel Durston, R.E., one of the Local Government Board Inspectors, recently held an inquiry on behalf of that body at the Town Hall with reference to the application of the Town Council for the Board's sanction to the purchase of property in Granby-place and Hall-street, and the appropriation of the same monies to such purpose; and to the borrowing of 7,000l. for street improvement and sewerage purposes.

**DRAINAGE SCHEME, HAYES, BUCKS.**—Mr. E. A. Sandford Fawcett, A.M. Inst. C.E., recently held an enquiry at Hayes, into the application of the Uxbridge Rural District Council for the sanction to borrow 10,000l. for sewerage and sewage disposal for the parish of Hayes. Mr. C. Woodbridge, Clerk to the District Council, explained that the scheme had been prepared by Mr. John Anstie, and he estimated the cost as being 9,575l. 3s. 3d.

**MANCHESTER SEWAGE IN THE MERSEY.**—At the weekly meeting of the Health Committee of the Liverpool City Council on the 13th inst., Mr. Isaac Turner drew attention to the amount of refuse from Manchester which, he said, was deposited in the Mersey. He was given to understand that hundreds of tons of refuse were discharged into the river without its having undergone any process of filtration or having been passed through a destructor. This, he considered, constituted an absolute danger to the city and a nuisance, drifting, as the refuse did, with each turn of the tide. It was becoming a scandal, and ought to be stopped.—Mr. W. Roberts stated that the Manchester Corporation had two large barges, one carrying 1,000 tons and the other 600 tons. The refuse was sent in iron tanks, and it was discharged outside the bar light-tanks, and it was given to understand that about 1,500 or 1,600 tons of putrid matter were thrown into the mouth of the Mersey, and, if so, it was a danger to Liverpool. Some action ought to be taken to stop it.—Mr. Sheldermine pointed out that crude sewage from Oldham was being turned into the Ship Canal and that it was bound to come into the Mersey sooner or later. Dr. Hope (Medical Officer) thought that the attention of the conservators of the Mersey ought to be called to the matter. Ultimately the Committee directed Dr. Hope and the city engineer to report to the Committee as to the deposits of refuse by the Manchester Corporation in the mouth of the river and the discharge of refuse into the Ship Canal.

**THE SCARCITY OF LEEDS WATER.**—The storage of water in Leeds reservoirs on the 13th inst. was 778 million gallons, as against 1,122 million gallons on the corresponding day a year ago. The present supply is equal to thirty and a half days, while a year ago it was equal to fifty and a half days. The Waterworks Committee appeal for further consideration in the saving of water.

**SEWERAGE SCHEME, MORECAMBE.**—A public inquiry was held on the 14th inst. at the Morecambe Council offices before Colonel W. Langton Coke, Local Government Board Inspector, in connection with the Morecambe District Council to borrow 60,000l. for purposes of sewerage and sewage disposal, and also 15,000l. for works of private street improvements. Mr. H. B. Nicholls, the Engineer, in explaining the scheme, said it provided for an aggregate of 60,000 people. The sewage works would take about three years to complete, and at that time the population would be about 15,000, for which provision should be made during five months of the year. For about three months at the beginning and end of the visiting season the population would be increased to 25,000, and during the summer months to 45,000, and on that basis the population was in the future likely to reach 60,000.

**CONDITION OF YARMOUTH ROADS.**—The question of the health of Yarmouth was one of the principal



subjects dealt with by the Yarmouth Town Council on the 11th inst. The Sanitary Committee a month ago delegated to the Medical Officer of Health and the Surveyor the duty of indicating the local "plague spots." These officers now reported that they had visited two "sample districts within the town walls which contained dwellings of the kind that were the source of such frequent complaint." On the presentation of the list of houses condemned, it was unanimously resolved that the owners be served with notices under the Housing of the Working Classes Act, 1890, with the view to such houses being closed unless made fit for human habitation. The Town Clerk was instructed to take proceedings accordingly.

**SOUTHAMPTON DOCKS.**—On October 12, 1898, was laid the foundation-stone of the first dock at Southampton, and on the 12th inst. the coping-stone was laid of the new deep-water quays. Mr. John Aird, jun., had, on behalf of the contractors for the works, presented the Provincial Grand Master of Hampshire and the Isle of Wight with a silver trowel, cement (presented by the Engineers, Messrs. Galbraith & Church) was laid on the stone, which was then lowered into position.

### STAINED GLASS AND DECORATION.

**WINDOWS, ALLONBY.**—At Allonby, on the west coast of Cumberland, three stained glass windows have been placed in the chancel of the parish church. They are the work of Messrs. Wailes & Strang, of Newcastle-on-Tyne. In the centre compartment is shown the Crucifixion of our Lord, with St. John and the Virgin Mary on either side; the distant city of Jerusalem being placed in the background. The two side compartments are filled with subjects illustrating Christ stilling the storm and the calling of St. Peter.

**MEMORIAL WINDOW, BODMIN.**—A stained glass window has been placed in Bodmin Church in memory of the late Colonel Gilbert, C.B. The design was placed in the east end of the chancel and the subject illustrated is the "Deum." The work was executed by Messrs. Clayton & Bell, of London.

### FOREIGN.

**FRANCE.**—M. Charles Lucas has asked the Municipal Administration to place a commemorative tablet on the house bearing the No. 204 in the Rue Mouffetard, where Charles Garnier was born. There is a talk of turning the fine park at Montmartre, belonging to Baron Michel de Vrethaigne, into a public square. There is also talk of turning the large Avenue de Breteuil, which leads to the square of the Hôtel des Invalides, into a public square. M. Albert Maignan, has just finished the whole decoration, with which he was entrusted by the State, for the foyer of the Opera Comique. This great decoration includes a ceiling and vertical panels, measuring altogether about 140 superficial metres. The Chamber of Commerce works, estimated to cost about 1,084,000 francs, are to be undertaken at Falimpol (Côte du Nord) for the enlargement of the tidal basins in the port of that town. A new Hôtel des Postes is shortly to be made at Limoges in the quartier Viraclaud.

There is a talk of erecting the statue of Alfred de Musset in the Place du Théâtre Français. The statue is by M. Mercie. On Sunday last a monument was inaugurated at Chaumont in memory of the French soldiers who died in the war of 1870. This monument, which is the work of M. Tony Noël, represents an officer leaning on a broken gun, supporting in his arms a wounded soldier who wears a winged figure symbolising the genius of France. The monument stands on a quadrangular pedestal about six metres high, decorated with trophies, warlike attributes, and foliage. A bronze iron decorates the foot, and different inscriptions are engraved on the base, which is of a vase granite. M. Valdemar, member of the Institute, has been elected member of the Conseil Supérieur des Beaux-Arts in place of the late Charles Garnier. The Academy is announced, at the age of thirty-eight, of M. Camille Martin, painter, who also executed decorative designs, and exhibited every year, at the New Salon, artistic bindings in a mosaic of leather, showing much taste and invention. M. Martin had been commissioned by the Municipality of Paris to prepare, for the Galliera Museum, a binding having for subject the ancient trades and corporations of Paris. The design was announced by M. Pabst, painter, and pupil of Charles Comte, who had been long an exhibitor in the annual Salons. He obtained a medal in the Salon of 1874.

**AN AUSTRALIAN MINING AND GEOLOGICAL MUSEUM.**—Sydney possesses a large and well-arranged mining and geological museum, which has been placed in connection with the New South Wales Department of Mines. It resembles in its functions such institutions as the London Museum of Practical Geology, the Museum of the Mining

Bureau of California, the Calcutta Geological Museum, and the Ottawa Geological Museum. The Sydney Museum is attached to most geological surveys, and the Johannesburg Chamber of Mines and the Transvaal Republic are now actively engaged in establishing mineral collections. The Sydney Museum was opened to the public on March 6, 1876. In 1881 the collections were removed to the buildings in which the Sydney International Exhibition of 1879 was held, and were destroyed in the conflagration to which it fell a prey in September, 1882 some 50,000 specimens being lost. Subsequently the nucleus of a fresh collection was opened in Sydney, and at the present time there are about 15,000 specimens on view in a large building in the Sydney Domain, a public reserve near the Houses of Parliament and leading Government offices. The exhibits include a fine collection of mineral and rock specimens, the great majority of these being New South Wales ores, also another of fossils, exemplifying the stratigraphy of New South Wales, tableted and arranged stratigraphically in cases round the walls in ascending geological order. Of the central floor space, one-half is occupied by the mineral ores and substances of economic value, and the other half by the rock-forming minerals and a number of foreign ores. In every respect the strictly scientific aspect has been subordinated to that which is commercial and practical, and no attempt is made to make a general collection of minerals. The object of the museum is to illustrate the geology, and more particularly the mining geology, of New South Wales; this being supplemented, so far as space will permit, by carefully chosen specimens from foreign mining districts. The guiding principle in the arrangement of the mining exhibits, which constitute by far the most prominent section, is to illustrate the occurrence of ore, country rock, associated minerals, &c. All the mineral deposits are placed near one another, and arranged geographically. Thus, a visitor consulting the foreign copper series will find each important copper-mining centre in the world illustrated in the manner just referred to, the ores of each district being placed together, irrespective of their nature.

### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—The firm of Messrs. D. & J. Tullis, Kilbowie Iron Works, has been formed into a limited company, and henceforth takes the title of "D. & J. Tullis, Limited."

**CLAIM FOR A SCAFFOLD ACCIDENT.**—At the Croydon County Court on the 11th inst. George Davis, a carpenter, Thornton Heath, brought an action under the Employers' Liability Act against Henry Young, of Herne Hill, his employer, to recover the sum of 50*l.* damages for injuries sustained on March 28 by falling from a ladder while working at the extension of Thornton Heath Polytechnic. The plaintiff's case was that he fell because the ladder did not project sufficiently beyond the level of a landing on the scaffold, so that it could serve as a handrail. It was only 4 ft. 6 in. from the floor of the scaffold, whereas it should have been at least 6 ft. Judgment was given for the plaintiff for 50*l.*

**ELECTRIC LIGHTING.**—**ENRIDGE WELLS.**—At the Town Hall, on the 4th inst. Mr. E. Stanford, Fawcett, A.M.I.N.C.E., held an inquiry on behalf of the Local Government Board respecting the proposal of the Corporation of Tunbridge Wells to secure another loan of 15,000*l.* for electric light extension purposes. The Town Clerk said that two electric lighting loans had already been sanctioned—one in 1893 of 13,000*l.*, and another in 1895 of 12,000*l.* At the initial stage of the electric lighting scheme Mr. Preece had advised a tentative outlay of 13,000*l.* which would meet the expenses of 4,000 glow and thirty-five arc lamps. There had been an increase from 13,000 to 20,000 glow lamps. The gross revenue last year was 4,208*l.*, and this year 5,094*l.* At the end of March, 1898, the number of consumers was 350, and the number of streets illuminated was now fifty-seven. The mileage of cable was eighteen in 1897, and there were thirty miles at present. Mr. Boot, electrical engineer, gave further evidence.

**CROYDON MUNICIPAL OFFICERS' ASSOCIATION.**—At a meeting held in June last, of public officials of the Corporation of Croydon, the Croydon Rural District Council, and the Croydon School Board, convened for the purpose of considering the advisability of forming a local association of such officers, a representative (provisional) committee was appointed to inquire into and report upon the matter. A general meeting, over which Mr. James Wilson, Clerk to the Croydon Rural District Council, presided, and at which there was a large attendance, was held in the Town Hall on Friday, September 30, to receive the Committee's report. The Committee, recognising the success already achieved by other similar associations, notably those of Liverpool and Hull, reported favourably upon the scheme, submitted to the meeting a code of rules, and suggested that the association be called "The Croydon Municipal Officers' Association," and that its objects be (a) to promote a knowledge of the principles of local government, and (b) to provide means of social intercourse and recrea-

tion amongst its members. These suggestions, together with the rules, were adopted. The members then elected Mr. W. Gunner (Borough Accountant), Hon. Treasurer, and Mr. John Earwickler (Borough Engineer's Department), Hon. Secretary, and their Executive Committee for the ensuing year. The Hon. Secretary reported that the Mayor of Croydon (Mr. Councilor S. G. Edridge) had kindly consented to become President, and the following gentlemen Vice-Presidents:—Aldermen Sir Frederick Edridge, F. Foss, S. Lee Rymer, Martin Taylor, J. Thrift, and D. B. Miller; Councilors T. Dobson, F. King, G. Shirley; Mr. J. Salter, Whiter and J. W. Williams (Chairman and Vice-Chairman of the Croydon District Council); Mr. F. Parsons Smith and the Rev. W. F. H. Randolph (Chairman and Vice-Chairman of the Croydon School Board); and Mr. E. Mawdesley (Town Clerk of Croydon). The Hon. Secretary announced that the Town Clerk had promised to read a paper at the first meeting of the Association, which will be held on Friday, October 28, at 8 p.m.

**REDEDOS, ST. FAITH'S CHURCH, LINCOLN.**—A new reredos in St. Faith's Church, Lincoln, was dedicated on the 11th inst. The reredos, designed by Mr. Hodgson Fowler, of Durham, the architect of the church, has been executed by Messrs. Bowman, of Stamford, the builders. The large figures have been carved by Mr. Milburn, of York, and the whole of the painting and decoration carried out under the superintendence of Mr. W. O. Powell, church decorator, Lincoln.

**PLUMBERS' CLASSES, PERTH.**—The winter session of the plumbing classes connected with the National Registration of Plumbers in conjunction with the Perth School Board was opened last Saturday night in the Science Room of the Perth Academy by a lecture by Dr. John S. Lumsden, Mr. James Ramsay, chairman of the Evening Continuation Classes Committee, presided, and amongst those present were ex-Ballie McNeil, Mr. E. H. Miller, solicitor, Mr. Ellison, technical instructor, and Mr. Wm. Watson. The Chairman, in his opening remarks, said that he saw in this new departure an indication of the progress they were making in their appreciation of the value of science teaching, and especially of technical instruction. After Dr. Lumsden had delivered his lecture, Mr. Wm. Watson, in the course of a few observations, said that the practical classes had for four or five years been conducted with splendid results, and they now had the advantage of a teacher in the science subjects in the person of Dr. Lumsden. The Chairman then presented the certificates gained last session by John Morton and David Welsh in the examination held under the graded syllabus of the Plumbers' Company.

**PROPOSED SALFORD IMPROVEMENTS.**—On the 21st inst. Major-General Crozier, R.E., an Inspector of the Local Government Board, held an inquiry at the Salford Town Hall into the application of the Corporation for the approval of the modification of the scheme relating to the borough, which was confirmed by the Local Government Board's provisional order (Housing of Working Classes Act, 1891), and for power to borrow 45,000*l.* for the purpose of the housing of the poor, 8,000*l.* for public walks and pleasure grounds, 3,000*l.* for the purpose of defraying half the cost of widening Regent-road Bridge, and 10,765*l.* for various street improvements.

**CARPENTERS' HALL LECTURES.**—The first of the autumn course of free lectures to students on building and sanitary construction at Carpenters' Hall, London Wall, was delivered on Thursday last week by Professor T. Roger Smith, the subject of the lecture being "Sites, Foundations, and Sanitary Requirements." Before delivering his lecture, Professor Smith referred to the nature and object of the course, remarking that the lectures were intended to lead up to the examination which is held in December. It had been decided to make the lectures of each lecturer more or less a little course of consecutive instruction in themselves. Previously, each lecture had been given by a different lecturer, whereas this year he would give two lectures, Professor Banister Fletcher would deliver two (on sanitary construction, warming and ventilation), the concluding lecture being by Mr. J. Bartlett. Professor Smith then proceeded with his lecture.

**DORCHESTER MAIN ROADS MAINTENANCE ARBITRATION.**—The Town Council of Dorchester have now received the award of the Local Government Board in regard to the inquiry held at Dorchester by one of their Inspectors on Tuesday, July 19, as to the difference between the Dorsetshire County Council and the Town Council as to the amount of contribution payable by the former body to the latter in respect of the maintenance and repair of the main roads for the year ending March 31, 1897. The amount claimed by the Town Council was 849*l.* 4*s.* 10*d.* The County Council paid 651*l.* 15*s.* 4*d.*, leaving a balance of 197*l.* 8*s.* 6*d.* in dispute. Out of the amount of 849*l.* 4*s.* 10*d.* claimed by the County the Local Government Board have now made an order that the County Council shall pay 821*l.* 8*s.* 2*d.* Thus the Town Council have an award for the payment of 166*l.* 12*s.* 10*d.* out of a balance of 197*l.* 8*s.* 6*d.* in dispute. For the footpath improvements 166*l.* 10*s.* 2*d.* was claimed, and 166*l.* 10*s.* 6*d.* allowed by the Local Government Board. This sum to be paid by the County Council to the Town Council in ten equal annual instalments, the first to be paid forthwith. In the arbitration above re-



ferred to the Borough Surveyor (Mr. G. J. Hunt) was supported in his evidence by Mr. F. W. Lacey, M.I.C.E., Borough Engineer of Bourne-mouth; Mr. E. P. Hooley, A.M.I.C.E., County Surveyor of Notts; and Mr. J. Elford, Borough Surveyor of Poole. Evidence was given on behalf of the County Council by Mr. W. J. Fletcher, A.M.I.C.E., supported by Mr. T. Coddington, M.I.C.E.

#### PRESTON MASTER BUILDERS' ASSOCIATION.

The ninth annual meeting of this Association was held at the Castle Hotel, Preston, on the 6th inst., when Mr. C. Walker was in the chair. After the confirmation of the minutes and other routine business, the Secretary (Mr. John Tomlinson) presented the committee's report, which stated that eleven employers had joined during the past six months. During the last half-year a considerable advance had been made with the federation movement, but much remained to be done before the scheme for a national combination could be effectually realised. The Lancashire and Cheshire Federation had been greatly strengthened, and now consisted of 20 local associations with an aggregate membership of 1,400, while this number should be much increased shortly, as large part of Cheshire was not yet affiliated. There was every prospect of early steps being taken to form the Northern Centre of the National Federation by the amalgamation of the Lancashire and Cheshire with the Yorkshire and Northern Counties Federations. The report proceeded: "Among other matters which are engaging the attention of the Federation is a scheme for establishing societies for foremen and clerks. Proposals for regulating the number of apprentices, so as to obtain a sufficient supply of labour in all branches are also being dealt with, and the more effectually to do this, it has been decided to appoint standing committees for each trade to con-sult with and advise the Executive Board. On July 1, the Workmen's Compensation Act came into force, and your Committee strongly recommend all members who have not already done so to insure themselves against liability. As the new Act will increase the cost of building operations at least 1 per cent., your Committee recommend that all architects be asked to include a clause in quantities providing a sum for insurance has been done in several towns and has met with a ready assent from the architects approached.—The Hon. Treasurer, Mr. R. Crossdale, presented his financial statement which showed a considerable balance in hand, and the balance sheet was adopted and ordered to be circulated. Mr. Chas. Walker was again elected President. Messrs. T. H. Kellett and J. Cartmell, Vice-Presidents; Mr. R. Crossdale, Hon. Treasurer; and Messrs. W. Caterall and A. Tullis, Hon. Auditors. Mr. R. Crossdale, T. Bradshaw, and T. Park, were elected on the Trade Committee of the Lancashire and Cheshire Building Trades' Employers' Federation, and Messrs. Walker, Kellett, and Crooke, to retain office on the Executive Board of that body until May 30 next. Matters of trade interest were dealt with and a cordial vote of thanks to the Chairman closed the proceedings. After the meeting, the fifth annual dinner of the Association took place, about forty members and friends being present. Mr. Charles Walker occupied the chair, and Mr. T. H. Kellett the vice-chair.

**ELECTRIC LIGHTING FOR CREWE.**—The Crewe Town Council have put their seal upon a contract for the purchase of three acres and two roads of land in Edleston-road, near the centre of the borough, for an electric light station. The land is to cost 1,000l. Sanctions has been asked to borrow 26,000l. for the electric lighting of the town.

**NORTHAMPTON MASTER BUILDERS' DINNER.**—The annual dinner of the Northampton Master Builders' Association was held in the Assembly Room of the George Hotel, Northampton, on the 13th inst. Mr. E. D. Sharnan (the President of the Association) occupied the chair. The loyal, patriotic, and municipal toasts having been honoured, Mr. Henry Martin proposed "The Architects." Mr. J. T. Ingman and Mr. Sidney Harris responded. Mr. Burditt gave "Success to the Northampton Master Builders' Association." The Chairman, in a brief response, said that this year the Association had been very successful. Most of the members had joined to the Accident Insurance Company, Limited, and the Association was out of debt. Mr. A. J. Chown proposed "The Town and Trade of Northampton," to which Mr. T. L. Wright replied. "The Visitors" was proposed by Mr. E. Archer, and was responded to by Mr. Hill. Mr. Hawtin gave "The Secretary." The toast was received with musical honours. Mr. Ains in response, said that it was twenty-two years since the society did him the honour of appointing him its secretary. He had studied during that time to do the very best he could for the interest of the builders of Northampton, all of whom he regarded as personal friends. Mr. Henry Green proposed "The Chairman." The toast was musically honoured. After Mr. Sharnan's reply, Mr. J. M. Panting submitted "The Vice-Chairman." "The Committee" was proposed by Mr. Pullen, and responded to by Mr. E. Archer.

**FIRE AT A TIMBER YARD.**—At a quarter-past three o'clock on Monday morning a fire broke out at the Cadogan Works, Manresa-road, Chelsea, S.W., owned and tenanted by Messrs. Garlick &

Horton, Limited, builders and decorators. The flames burst out in the centre of a big timber-yard, and speedily threatened the saw-mills, joiners' workshops, and other property. After the gates of the yard had been battered in, attempts were made by the earliest arrivals amongst the firemen and police to rescue the horses from a building which was already involved, and eight of the animals were successfully removed to a place of safety. At one time there were sixteen steamers, three manuals, and over 100 men on the ground, under the personal direction of Commander Wells.

**THE FUNCTIONS OF SANITARY INSPECTORS.**—Sir Douglas Galton, as Chairman of the Council of the Sanitary Institute, delivered an address on Monday at the Parkes Museum, Margaret-street, as an introduction to a course of lectures and demonstrations in sanitary science, in the course of which he referred to the multifarious duties cast upon the Sanitary Inspector, and pointed out the need of special training for the discharge of these functions. He thought, however, that the most astonishing fact connected with recent legislation was that whilst the Sanitary Inspector, who was intended to be the right-hand of the Medical Officer of Health, was required to possess considerable knowledge and technical skill, he was nowhere protected either as to his employment or as to the tenure of his office. He urged that sanitation should be made a branch of elementary education; meanwhile the Sanitary Inspector was the missionary upon whom devolved the duty of urging the people to pay attention to sanitary details. In reference to the requirement of the Public Health Act (London), 1891, that sanitary inspectors should possess a certificate of competence from some authority approved by the Local Government Board, Sir Douglas announced that some delay had occurred in forming the joint board for this purpose, to be composed of delegates representing the Sanitary Institute and other bodies, and that, consequently, next year's examinations would be conducted by the Sanitary Institute alone.

**THE LONDON SKETCH CLUB.**—The private view of the London Sketch Club's first exhibition of "Time" sketches and sketches from nature will take place at the Modern Gallery, 175, Bond-street, W., on Tuesday, the 25th inst., and the exhibition will be open to the public from the 26th to the 29th inst. inclusive.

#### CAPITAL AND LABOUR.

**ASHTON-UNDER-LYNE JOINERS.**—The joiners of Ashton-under-Lyne, Dukinfield, Stalybridge, Hyde, and Denton have decided to give six months' notice in November for an advance of wages of 3d. per hour of work. They will ask for an increase of 2 1/2d. per hour, and 2 1/2d. fewer hours per week. If this demand be conceded they will then have 9d. per hour and a week of 51 1/4 hours.

**THE MANCHESTER BUILDING TRADE.**—On the 10th inst. lodge meetings in connexion with the Manchester and District Joiners and Carpenters' Union, which has a membership of nearly 2,000, took place at Pendleton and Swinton, for the revision of rules. It was stated that the building trade in the area covered by the Union had been in a most prosperous condition during the summer, and there were at present no signs of depression. The local branch secretaries reported that the union were in a most satisfactory condition, the carpenters having been very few indeed. At Swinton there were no members in receipt of out-of-work pay at the present time. The rate of pay was incidentally stated to be 9d. per hour, and satisfaction was expressed that the joiners of Ashton, Dukinfield, Stalybridge, Hyde, and Denton have decided to make application for an advance of 3d. per hour, which will bring them in line with the rate of pay of the joiners in the Manchester and District Union.

**BARRY MASONS' STRIKE.**—The Conciliation Committee, represented by both masters and men concerned in the present lock-out of masons at Barry, have continued their meetings during the dispute, and on the 15th inst. a decision was arrived at whereby the masters have decided to withdraw the lock-out notices provided the men agree to work with non-Unionists.

#### LEGAL.

##### CLAIM UNDER THE EMPLOYERS' LIABILITY ACT.

At the Exeter County Court on the 12th inst., before His Honour Judge Woodfall, Alfred Francis Pester, carpenter and joiner, claimed of Messrs. Luscombe & Son, builders, Exeter, 150l. damages for an accident alleged to have been caused by their defective machinery. Mr. A. E. Dunn appeared for plaintiff; Mr. Harris (Ford, Harris, & Ford) appeared for the defendants. Mr. Dunn explained that plaintiff on June 28 last, while in the employment of the defendants was engaged working a planing machine when his hand caught in the revolving knives and he had a portion of his finger and thumb torn away. Mr. Dunn contended that the machinery was defective, inasmuch as it was not fenced, and he argued that the machinery in question was dangerous. Plaintiff gave evidence as to the accident. At Mr. Lus-

combe's he was earning 35s. a week. He had since taken a situation at Plymouth and was dismissed at an hour's notice. Mr. A. J. Martin, civil engineer, said he had seen the machine and estimated the rate at which the cutters went at from 2,000 to 2,400 revolutions a minute. He considered the knives a dangerous part of the machine. Had the guard for the knives which had since been obtained been used previous to the accident the latter would have been prevented. Mr. Davis, Engineer and Inspector of Factories, said the revolutions of the knives would be 2,500 to 3,000 a minute. He considered it a dangerous part of machinery which ought to be fenced.—Mr. Harris, in defence, contended that it was not a dangerous machine, and did not come within the meaning of the Factory Act, and therefore the want of fencing did not imply negligence. Mr. Luscombe stated that he had had the machine in question in his works about two and a half years, and there had never previous to the one in question been any accident caused by it. No complaint had ever been made to him that the machine was dangerous. The Factory Inspector had visited the workshop and did not require any protection or guard to the planing machine.—Mr. Stoneman, foreman of the mill, of the last witness, gave evidence.—His Honour gave a verdict for the full amount claimed.—*Western Times.*

##### ST. MARY'S CHURCH, CHARING CROSS-ROAD.

At the Marlborough-street Police-court, on the 12th inst., the owner of St. Mary's Church, Charing Cross-road, was summoned before Mr. Plowden for not taking down certain portions of the south and west walls of the church in question that were cracked, loose, or otherwise defective.—Mr. J. W. Godfrey prosecuted on behalf of the London County Council. No one appeared in answer to the summons.—Mr. Charles F. Hayward, District Surveyor of St. Anne's, Soho, stated that in July he visited the church, and found that the wall on the west side was defective. He served a notice to abate the danger. The danger still existed, and was increasing every day.—Mr. Plowden ordered the necessary work to be commenced within two days.

##### ALLEGED BREACH OF BUILDING BY-LAWS, COVENTRY.

At the County Police-court, on the 14th inst., A. A. Wincott, builder, was summoned by F. A. Delamotte, Surveyor to the Foleshill Rural District Council, and charged with using inferior materials when erecting a building at Foleshill, and also with not causing a "damp course" to be laid.

The case for the Council was that defendant was erecting houses on a clayey soil, and that the damp course provided was not a proper one. Several witnesses were called on the Council's behalf. The defence was that the damp course was effective, and that this was the opinion of the late City Surveyor of Coventry.

The Bench dismissed the case.

Mr. Masser, for the Rural District Council, said the Council would appeal against the decision.

The summons for the alleged use of inferior building materials was adjourned at the request of Mr. Masser.

##### THE COUNTY COUNCIL AND ABBEY MANSIONS.

The summons against the owner of Abbey Mansions (North Block), instituted by the London County Council under the Dangerous Structure Clauses of the London Building Act, again came before Mr. Marsham at Westminster, to whom was presented the award of the arbitrator to whom matters in dispute had been referred.—Mr. Dalby, for the County Council, said that the arbitrator had decided in their favour. He said that the building ought to be shored up, his worship would recollect that this was a great bone of contention—that the defective stonework should be taken out and replaced, and that certain openings on the basement and ground floors should be filled up solid.—Mr. Pollock, for the owner, Mr. Pawley, said he did not mind paying his own costs, but inasmuch as he claimed the right of the Council to proceed under the Act, he refused to bear the expenses of the claimants.—After a long argument the question of costs was reserved until the superior Court's decision on the earlier summons (heard last July) as to the building being vested in the Government.—*Daily Graphic.*

##### THE LONDON BUILDING ACT, 1894:

###### PARTY WALL DISPUTE IN CHEAPSIDE.

The case of Hobbs, Hart, & Co., Limited, v. Grover, came before Mr. Justice Channell, sitting as Vacation Judge, on the 19th inst., for an injunction to restrain the defendant from interfering with the plaintiff's wall between Nos. 75 and 76, Cheapside.

Mr. Mulligan, Q.C., who appeared for the plaintiffs, stated that his clients were the owners of No. 76, Cheapside, and the defendant was the building owner and interested in No. 75, upon the site of which he was about to build. The plaintiffs used their premises for the deposit



of very heavy materials, and therefore it was very essential that the wall should be kept in good condition and that they should know what was going to be done with it. On September 2 the London Building Act 1894, of his "intention to execute the following works on the said party structure which might, on survey, be found necessary or desirable," and he then enumerated every single class of work that could be done to a party structure under the Act. The learned counsel contended that that notice was a violation of the Act and was bad, as it did not state specifically the particular work the defendant was going to do.

Mr. Alexander, Q.C., for the defendant, said that the plaintiffs had never asked for particulars of the proposed work, but his client was perfectly willing to show the plaintiffs the plans of the proposed building so soon as he should receive the same from the District Surveyor, or to give the plaintiffs any such further information as they might require.

Mr. Mulligan replied that the notice was bad, and the plaintiffs were entitled to the injunction until the trial.

His Lordship, in giving judgment, said he had great doubts as to whether the notice was bad at all, but he had some doubt whether the notice was sufficient to authorise the defendant to raise the wall; but as that question would not arise for some months from now, he should suggest that the defendant should agree to strike out that part of the notice and serve the plaintiffs with a fresh notice as to that.

After some discussion, it was arranged that the defendant should give an undertaking not to act upon the notice which turned upon the raising of the wall without giving plaintiffs a further notice, and also agreeing to extend the time for the plaintiffs appointing a surveyor, and the notice was dismissed, the costs to be costs in the action.

#### WHITECHAPEL BUILDING DISPUTE.

The case of Rosenberg v. Smolensky came before Mr. Justice Channell, sitting as Vacation Judge, on the 19th inst., it being an application by the plaintiff to continue an interim injunction restraining the defendant until the trial from interfering with a wall in Whitechapel which divided the plaintiff's building from a building which the defendant was erecting in the rear of his existing building.

Mr. Crane, on behalf of the defendant, strenuously denied that his client had done anything which would justify an injunction being granted, but in the result his lordship continued the interim injunction until the trial, and made the costs costs in the action.

#### MEETINGS.

FRIDAY, OCTOBER 21.

*The Architectural Association.*—Conversations, King's Hall, Holborn Restaurant, 8 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Dr. H. Manley on "Sanitary Law, English, Scotch, and Irish." General Enactments Public Health Act, 1875; Model By-laws, &c., 8 p.m.  
*Institute of Junior Engineers (Westminster Palace Hotel).*—Presidential Address by Sir W. H. White, 8 p.m.

SATURDAY, OCTOBER 22.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection at the Wimbledon Sewage Works, 3 p.m.  
*Northern Architectural Association.*—Excursion Meeting. The President will conduct the party over Messrs. Robinson's new premises, Clavering-place, Newcastle.

MONDAY, OCTOBER 24.

*Sanitary Institute (Lectures for Sanitary Officers).*—Dr. W. A. Bond on "The Law Relating to the Supervision of Food Supply," 8 p.m.

TUESDAY, OCTOBER 25.

*Norhampton Institute, Clerkenwell.*—Mr. F. Bond on "Early Gothic," 8 p.m.

WEDNESDAY, OCTOBER 26.

*Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).*—Inspection in the Parish of St. George's, Hanover-square, 3 p.m. Professor A. Bostock Hill on "Trade Nuisances," 8 p.m.  
*Institution of Mechanical Engineers.*—Ordinary General Meeting. The following papers will be read and discussed as far as time permits:—(1) "Electric Installations for Lighting and Power on the Midland Railway, with Notes on Power absorbed by Shafting and Belts," by Mr. W. E. Langdon, Superintendent of the Electrical Department, Derby. (2) "Results of Recent Practical Experience with Express Locomotive Engines," by Mr. Walter M. Smith. (3) "Mechanical Testing of Materials at the Locomotive Works of the Midland Railway, Derby," by Mr. W. Gadsby Peck, of Derby, 7.30 p.m.

THURSDAY, OCTOBER 27.

*Carpenters' Hall, London Wall (Free Lectures on Building and Sanitary Construction).*—Professor Banister Fletcher on "Sanitary Construction, Warming, and Ventilation," 7.30 p.m.  
*Institution of Mechanical Engineers.*—Ordinary General Meeting (concluded).

FRIDAY, OCTOBER 28.

*The Architectural Association.*—Mr. J. E. Newberry on "Excavations at Thebes," illustrated by Lantern Views, 7.30 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Dr. J. F. Sykes on "Objects and Methods of Inspection," 8 p.m.

SATURDAY, OCTOBER 29.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection at the T. & A. Duty Company's Farm, College Farm, Finchley, 3 p.m.

#### RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until November 28.

15,116. FIREPROOF FLOORING AND SIMILAR STRUCTURAL ARRANGEMENTS; E. L. Pease.—This invention, more especially adapted for flooring of the kind described in Mr. Pease's letters patent of 1895-10,783, provides for troughing or pooling water within the structural elements of the floor, and in such a manner that the water is readily affected by heat generated into steam, which issues through holes and perforations placed under the floor; also for arranging, as from a sprinkler, the supply shall be above that of the perforations, so that the water may be discharged therefrom. The troughs are charged with water preferably through a valve, whose lever is held in the shut-off position by a line made of a material easily to be consumed by fire, so that a continuous supply is automatically charged into the flooring when required.

21,775.—DRIVING SHEDS FOR CLAY WORKERS; E. W. Stevens.—The basement of the building, preferably rectangular on plan, is placed below the ground level; in the basement are placed furnaces which heat hot-water pipes, the floor upon which the goods to be dried are placed is made of rafters laid upon girders or arches fixed upon pillars or columns from the basement to the roof, and combustion are carried up by pipes placed under the top portion of the roof, and air-spaces in the side-walls or roof carry off vapour during the process of drying the goods.

22,098.—COMBINED DIVIDERS AND COMPUTING SCALES; R. F. Oswald.—The combined instrument comprised of a pair of dividers provided with a reading arm pivoted to one leg and sliding in a groove on the other, the legs being graduated with suitable scales, and the virtue of the angular displacement of the reading arm when a measurement is taken the functions of that measurement can be at once determined from the position of the index; the index is carried by the non-pivoted end of the reading arm, and slides in a groove formed on the surface of the compass-leg, scales are formed on the surface of the two legs.

22,725.—FASTENINGS FOR DOORS, WINDOWS, &c.; W. L. Thomas.—The short arm of an L-shaped piece of metal is let into the frame of the door, or between the sashes, and firmly secured; the other or long arm rests against the frame or sash rail's front part, so that its inner surface aligns with that of the door or other sash, when the latter is closed. At the apex of the L piece is a pivoted piece, which can be turned over or outwardly so as to bear against the side rail, and thereby hold it firmly in position, a spring or other catch mounted on the long arm engaging with a catch on the pivoted piece and preventing its return until it is released, thus preventing the door or window being opened; when the spring catch is disengaged from the extension upon the pivoted piece, it slides upon a curved surface upon the tension's other side, and the piece can be folded back or shut up out of the way of the door, and will be there retained by the catch.

22,155.—JOINT BOX FOR ELECTRICAL CABLES; K. J. Hatton and W. T. Henley's Telegraph Works Company.—One joint-box has double-walled ends connected by webs and guides, recessed for embracing the cable between them, and enclosing chambers for a filling of bituminous or other water-proof composition in the plastic state. The double wall-ends are made, partly, as removable parts. The other joint-box, for the coupling of underground with aerial cables, is bolted to a post, or other support, and the bottom of the box has an opening for passage of the underground cables, fitted with a watertight packing and gland. The insulation of each base conductor leading to the overhead wires is secured by passing it up axially through a double shed insulator firmly secured to the bottom of the box. The sides of the box are continued downwards below the bottom, curtain-wise, to throw off rain.

24,157.—CRAMP CONNEXION FOR ELECTRICAL CONDUCTORS; W. H. Nichols and W. T. Henley's Telegraph Works Company.—To facilitate the adjustment of the clamp in position before it is soldered and the necessity of a fine fit for ensuring perfect connexion, is devised a clamp in the shape of an oblong strap, between whose members slides a saddle-piece to be forced inwards by a pressure-screw, and of semi-circular form to firmly embrace between it and the curved end of the strap, the cable end; the strap also has a cone or side-lug for the attachment of a pair are electrically united.

25,257.—FLUSHING SYPHONS; M. J. Adams.—The improvement, for relieving air-pressure within a deeply-trapped flushing syphon, lies in placing one or more webs or divisions across the trap's diameter, and making the webs follow the bend of the syphon deep trap in such a manner that the sectional area of the syphon trap is divided into spaces which form a series of seals of varying depths, and aid discharge of air from within the syphon.

25,326.—SYPHONS FOR FLUSHING WATER-CLOSETS, URINALS, &c.; K. Ross, Junior.—The short leg consists of an outer or annular tube with closed end at top, but having a small hole for the liberation of any accumulated air; an inner tube, open at both ends, is secured by radial pins, which form a series of seals of varying depths, and fixed tube leading into the discharge pipe into the fittings of the syphon's long leg. A hollow float vessel is fitted around the inner tube, and a small S-shaped pipe leads from the float vessel down the central tube far enough to form an auxiliary syphon.

26,387.—FITTINGS FOR STAGE SCENES; J. B. Ormrod.—The invention relates to improved fittings to be fixed to the frames of stage scenes, whereby the latter are held in position with diagonal stay-rods hooked into the fittings at the top end and fixed to the stage at the bottom with thumb-screws. These are intended to prevent damage to the scene canvas (as caused by eye-screws) when packed for removal or stored away. A hinge-like fitting is made, whose top part is screwed to the scene-frame, and lower part has a hole to receive the hooked end of a diagonal stay-rod, so that when the rod is removed the lower part of the hinge fits closely level with the frame.

27,616.—APPLIANCES FOR SECURING SASH-FRAMES AND OTHER WOOD-WORK TO A JOINER'S BENCH; H. White.—The improvement consists of a wood block

secured to the bench by bolts and fly-nuts, against which the sill of the sash-frame, &c., is placed and held in position at each side by wheel screws attached to sliding bars, the bars are screwed up when adjusted by bolts and other wheel screws; friction plates may be placed at each end of fixed in the block, against which one of the sliding bars can be screwed up, and a plate on the block's face keeps the sliding bars in position; the head of the sash-frame is secured to the bench by screws, having a plate at one end and a hand wheel at the other, and fitted in brackets screwed to the bench, the screws being at right angles to the wood block.

15,931. STOP-COCKS OR VALVES FOR WATER SERVICE PIPES; E. D. Davis.—The body of a valve chamber has inlet and outlet apertures and a drainage outlet at its lower part; the stop-cock is connected with the supply-pipe, preferably outside the house, being placed in a small stump or pit at a level lower than that of any part of the service pipe within doors; the valve seat is formed immediately below the inlet, but above the outlet, and is closed by drawing it tightly against the seat's underside; when the valve is thus closed the water in all the service pipes will flow out through the third (drainage) outlet; the stop-cock is opened by screwing down the valve on to this contrivance the service pipes of a house can be readily emptied in the time of frost, or when their repair is needed.

16,043.—RENDERING THE SIDES OR WALLS OF GAS RESERVOIRS, PIPE CONDUITS, &c.; GAS-TIGHT; A. E. Reusenthal & Dr. J. Biltz.—The sides of the reservoirs, pipes, &c., are impregnated with a solution of metallic salts, say chloride of iron, in alcohol; on the evaporation of the alcohol the salts penetrate the pores of the material; when the vessels, &c., are charged with gas (there is formed, in consequence of the component parts such as ammonia and sulphide of hydrogen, found in all illuminating gases either oxy-hydrogènes or sulphates, the volume of which is considerably greater than that of the salts dissolved in the alcohol), the resulting end-product being sulphide of iron and ammonium chloride: "so that by chemical reaction an increase in volume occurs, and thereby the walls or sides are made impermeable by gas."

16,173.—MANUFACTURE OF PORTLAND CEMENT; La Soc. A. Le Clément de l'Industrie, à l'Industrie, &c., Belgium.—To facilitate the burning of natural and artificial cements, sodium chloride fumes are obtained in the kilns by blowing through the successive charges of fuel and lumps of about fifty kilogrammes of sodium chloride per ten tons of cement material; it is claimed that the method effects a large saving of fuel and produces burnt stone and cement with increased specific gravities, also that the cement, besides being free from sulphuric acid, possesses the qualities of the best slowly-setting cement, after test by tension and resistance experiments.

#### NEW APPLICATIONS.

October 3-8.

20,761. J. Wilson, Draught-proof Roof Ventilators.  
20,762. W. Forster, 20,837. A. G. Smith, 20,851. W. J. Gwyder, 20,930. G. Wilshire, 20,954. H. Colledge and Others, 20,965. R. Turri, 21,024. P. A. Martin, 21,138. J. McConnelly, and 21,422. S. Troubl, Acetylene Gas Generators.  
20,775. T. S. Weston, Pumps.  
20,781. Murray and Bray, Columns and the like.  
20,793. C. W. Hancock, Opening and Closing Window Casements.  
20,794. R. Adams, Door Checks and Door Closing Appliances.  
20,797. Vicomte de Verell-Kanri, Application of Oil Colours.  
20,828. A. W. Shepherd, Cleaning or Removing Pitch, Asphalt, and similar substances from Pavement Surfaces, Blocks, &c.  
20,815. Wellman-Seaver Engineering Company, Open Hearth Furnaces.  
20,823. G. Thomas-Davies, Electric Arc Lamps.  
20,827. W. Cradginton, 21,025. English Industrials, Limited, and Heigh-Dia, 20,846. W. Tattersall, Transfer Pallets for Bricks.  
20,831. J. Clarke and J. M. Jones, 20,845. L. S. Sengendorph, Metallic Ceiling and Wall-plates, and Means for Securing them to Metallic Beams.  
20,862. M. White, Oven-door Hinges.  
20,867. J. W. Hull, Fire-resisting Blinds.  
20,873. Dechons, Apparatus for Sealing up Roofs.  
20,877. W. E. Burnell, "Work Supports."  
20,880. A. T. Austin, Spanners.  
20,882. C. E. S. Sapp, and 20,976. J. P. Brice, Draught-Excluders.  
20,902. N. B. Hamilton, Boiler Flue Cleaners or Scrapers.  
20,904. E. S. Clark, Underground Conduits for Electrical Conductors.  
20,920. G. Love, Bricks, Tiles, &c.  
20,934. Flood & Smith, Step Ladder Stairs.  
20,941. J. Kyle, Storing, Seasoning, and Acreting Cement on Harbour and Building.  
20,957. N. N. Haigh, Recessing and Mortising Window Sills.  
20,965. H. Lisle, Gas or Other Stoves for Cooking and other Purposes.  
20,972. Anders & Wilson, Adaptation of the Telephone to Electrical Pushes for Private Houses, Offices, Hotels, &c.  
20,975. W. G. C. Reed, a Triplet.  
20,984. La Soc. J. Lacroix et Cie, Gas Burners.  
20,987. H. L. Hermsdorf, Grinding Spindle or Twist Drills.  
20,994. O. D. Lucas, Electrical Switches.  
20,999. J. Bates, and 21,018. M. J. Adams, Water-closets.  
21,003. T. E. Andrews, Electrical Glow Lamps.  
21,003. T. E. Herbert and Others, Drawing Pin.  
21,010. M. J. Adams, Everted and Read, Lamp Fittings.  
21,012. E. Vaughan, Sash Pulleys.  
21,031. Window Blind Spring Brake.  
21,043. E. W. Rice, Electrical Meter Systems.  
21,044. F. F. Cox, and 21,048. E. Electrical Meters for Alternating Current Circuits.  
21,047. W. Le Roy Emmet, Electrical Fuses.  
21,054. O. Ljungstrom, Gas Ignition and Extinction.  
21,057. C. L. Stiff, Joining Earthenware, Stoneware, and other Pipes.  
21,060. E. Schad, Acetylene Lamps.  
21,073. C. Westphal, Rejuvenating Artificial Stone.  
21,094. Jarvis & Scott, Hammers, Picks, &c.  
21,110. H. A. Hall, Portable Levels, Theodolites, &c.  
21,114. H. M. Barclay, Safety Claws, &c., and Cramps.  
21,115. S. W. Sengendorph, making Machines.  
21,136. C. May, Fire Alarm-Annunciators.  
21,140. J. W. Graydon, Closing and Opening Doors and Fireproof Shutters.  
21,149 and 21,230. Milo & Lapis Lazuli, and other Ornamental Objects, Marble, Rating Wood with Plain or Coloured Designs.  
21,150. E. Hungerbühler, Electrical Traction Apparatus.  
21,152. R. B. Jentzsch, Locks.  
21,154. P. Malverin, Expanding Pulleys.  
21,156. L. E. Jesse, Luminous Veneers by Dies and Pressure.  
21,175. H. Eustace, Metal Bead with a Flexible Mat for Glazing without Putty.  
21,183. W. Foggo, Ratchet Lever for Hauling, Lifting, &c.  
21,187. Fletcher & Russell, and Others, Gas Cooking



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Deadline to be delivered.
Four Drinking Fountains.....	Manchester Corp.....	Not stated.....	Oct. 31
*Higher Grade School.....	Burnley Sch. Bd.....	10, 7, 5, and 25l.....	Jan. 14, 99
*Restoration and Refitting Hall, Bristol L.A. ....	Colston Hall Comm. ....	.....	No date

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Road Walling, &c. Pontefract.....	Hersford C.O.....	J. E. Somers, Shire Hall, Bradford.....	Oct. 23
Stabling, &c. Salford Wharf.....	Birmingham Corp.....	J. E. Somers, Shire Hall, Bradford.....	do.
Electricity Works.....	Keynham R.D.C.....	W. M. Boulton, 10, 7, 5, and 25l.....	do.
Paving, &c.....	Edlington U.D.C.....	H. H. Hapworth, 10, 7, 5, and 25l.....	do.
Farthermore Pipes, &c.....	do.....	do.....	do.
Sewerage Works, Mitand-road.....	Llanelli B.R.....	Seash & B.R., 10, 7, 5, and 25l.....	do.
Schools, Aberystwyth.....	do.....	do.....	do.
Flint, &c.....	Wilton U.D.C.....	W. H. Hapworth, 10, 7, 5, and 25l.....	do.
Sewerage Works, Tainton road.....	do.....	do.....	do.
Warehouse, &c. Nuffield.....	Launce, & York, Ry. Co.....	Knights, 10, 7, 5, and 25l.....	do.
Laying 12 in. Sewer Pipes.....	Large Rural Commr.....	W. H. Hapworth, 10, 7, 5, and 25l.....	do.
Drainage at Workhouse.....	Cardiff Corp.....	J. E. Somers, Shire Hall, Bradford.....	Oct. 26
Alterations to Public Office, T. & G. Street, Telford.....	Glasgow Corp.....	J. E. Somers, Shire Hall, Bradford.....	do.
Road Works, Telford.....	Cardiff Corp.....	J. E. Somers, Shire Hall, Bradford.....	do.
Sewer, &c. Redwood lane.....	Walton Corp.....	J. E. Somers, Shire Hall, Bradford.....	do.
Cottage, &c. Johnstone N.B.....	do.....	do.....	do.
Fifteen Houses, Devon street.....	Darwen Co-op Soc. Ltd.....	J. E. Somers, Shire Hall, Bradford.....	do.
Public Hall, Drummie, Elgin.....	Weston & Co. Ltd.....	J. E. Somers, Shire Hall, Bradford.....	do.
School, Leith, &c.....	do.....	do.....	do.
Granite Road Metal.....	Woolbridge (Buckf.) U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
*Underground convenience.....	do.....	do.....	do.
Water Supply Works, Union street.....	Shire Hall Corp.....	J. E. Somers, Shire Hall, Bradford.....	Oct. 27
Additions to Premises, Eskdale street.....	do.....	do.....	do.
Drainage Works, Yelverton.....	Tavistock R.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
Road, &c. Highfield.....	Southampton Corp.....	J. E. Somers, Shire Hall, Bradford.....	Oct. 18
Concrete Wall, Llangwyfan.....	Brecon C.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
Chapel, &c. Clydach Vale R.D.C.....	do.....	do.....	do.
Wesleyan Mission Hall, Kelsby.....	do.....	do.....	do.
Street Works, &c.....	Arklow (Ireland) Town Commr.....	J. E. Somers, Shire Hall, Bradford.....	do.
*Three Potted Lamps for Water Works, &c.....	Salisbury U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	Oct. 29
House, &c. Darnley, Yorks.....	Longthorn (Ireland) U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
School, Darnley, Yorks.....	do.....	do.....	do.
Council Offices.....	Newquay U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
Sewage Disposal at Works, Carr Wood.....	Walton-le-Dale U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
House, &c. Kinkling Hill.....	Consett U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
House, &c. Fawcett at Sunderland.....	Kirkby U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
Alterations to Inn, Trowbridge.....	W. R. Harding.....	J. E. Somers, Shire Hall, Bradford.....	do.
Sewerage Works.....	Kirkby U.D.C.....	J. E. Somers, Shire Hall, Bradford.....	do.
Cottage Park, &c. Melling R.D.C.....	do.....	do.....	do.
Crematorium, Helon road.....	Hall Corp.....	J. E. Somers, Shire Hall, Bradford.....	do.
Drill Hall, St. Ebbw.....	Capt. G. B. Walker.....	J. E. Somers, Shire Hall, Bradford.....	do.
Offices, &c. Middlethorpe.....	Tees Conservancy Comr.....	J. E. Somers, Shire Hall, Bradford.....	do.
Tin Houses, Ponton, nr. Pontefract.....	J. H. Shepherd.....	J. E. Somers, Shire Hall, Bradford.....	do.
Waste Supply.....	do.....	do.....	do.
Church Tower Restoration, Ludgvan.....	do.....	do.....	Nov. 1
Bank Premises, St. Paul's road Featherstone.....	do.....	do.....	do.
Additions to Chapel, Knapthill.....	Trusted.....	J. E. Somers, Shire Hall, Bradford.....	do.

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Railway Works, No. 2.....	Paisley & Parkhead Dist. Ry. Co.....	J. Watson, 225, West George-st., Glasgow.....	Nov. 1
*Makings-up, Paving, &c. Streets.....	Leiston U.D.C.....	W. Dawson, Glasgow Hall, Leiston, F.....	do.
*Sewerage and Water Drainage.....	Brumley U.D.C.....	Brumley, Kent.....	do.
*Kerbing, Paving, Metalling, &c. Carlisle street.....	Leitham Board of Works.....	Sur. Town Hall, Oxford, S.E.....	do.
*Kerbing, Paving, Metalling, &c. Hinchell street.....	do.....	do.....	do.
*Kerbing, Paving, Metalling, &c. Hinchell street.....	do.....	do.....	do.
Sewerage, Carlislebrook.....	I. of Wight R.D.C.....	H. Watkins, 225, West George-st., Glasgow.....	Nov. 2
Sewerage Works, &c. Fairlie, Newport.....	do.....	do.....	do.
Water Supply Works, &c. Poulton, nr. Carlisle.....	Dalkey (Ireland) Commr.....	Dalkey, 225, West George-st., Glasgow.....	do.
*Alteration to Wards at Home.....	Wandsworth & Clapham Union.....	Gale, on Works, Church-lane, Tooting.....	do.
Stabling, &c. Dudley Hill.....	do.....	do.....	do.
Refuse Destructor.....	Hunstanton U.D.C.....	Hunstanton, 225, West George-st., Glasgow.....	Nov. 3
Hospital Extension.....	Widnes Corp.....	Widnes, 225, West George-st., Glasgow.....	do.
Brick Sewers (10 miles).....	Deal Corp.....	Deal, 225, West George-st., Glasgow.....	do.
Granite Road Metal.....	Hampton Wick U.D.C.....	Hampton Wick, 225, West George-st., Glasgow.....	do.
House.....	Walsall Sch. Bd.....	Walsall, 225, West George-st., Glasgow.....	Nov. 7
*Mason and Iron and Steel Work.....	Hedderley & Co.....	Hedderley, 225, West George-st., Glasgow.....	do.
*Town Hall and Offices.....	Hitchin U.D.C.....	Hitchin, 225, West George-st., Glasgow.....	Nov. 8
Railway Widening, Tondy & Bridgend.....	G.W. Ry. Co.....	G.W. Ry. Co., 225, West George-st., Glasgow.....	Nov. 11
Chapel, Hale Common, I.W.....	Coventry Corp.....	Coventry, 225, West George-st., Glasgow.....	Nov. 12
*Sewage Works.....	Birkenhead Corp.....	Birkenhead, 225, West George-st., Glasgow.....	Nov. 14
Baths, North End.....	Ranley, Staffs, Corp.....	Ranley, 225, West George-st., Glasgow.....	Nov. 15
*Refuse Destructor.....	L.C.C.....	L.C.C., 225, West George-st., Glasgow.....	do.
*Comer's Court, Paddington.....	do.....	do.....	do.
*Public Conveniences, Blackwall Tunnel.....	Aylesbury U.D.C.....	Aylesbury, 225, West George-st., Glasgow.....	Nov. 16
*Sewage Disposal.....	Pace Groynd Asylum, Bridgend.....	Pace Groynd, 225, West George-st., Glasgow.....	Nov. 24
*Chapel.....	do.....	do.....	do.
Rails and Fishplates (large contract).....	do.....	do.....	do.
*Works in connection with Tunnel under Thames.....	L.C.C.....	L.C.C., 225, West George-st., Glasgow.....	Nov. 29
*Ruled Steel Joists.....	do.....	do.....	do.
Repairs, &c. to Workhouse.....	Hay Union Gds.....	Hay, 225, West George-st., Glasgow.....	No date
Alterations to Premises, Frederick street, Shrewsbury.....	J. Martin.....	J. Martin, 225, West George-st., Glasgow.....	do.
Additions to Factory, St. Paul's, Bristol.....	do.....	do.....	do.
Warehouse, Nelson street, Leeds.....	do.....	do.....	do.
School, Darnley, near Barnsley.....	do.....	do.....	do.
Additions to School.....	Pathum Sch. Bd.....	Pathum, 225, West George-st., Glasgow.....	do.
Houses, Kildagora, Slacks.....	D. Boulton.....	D. Boulton, 225, West George-st., Glasgow.....	do.
Two Houses, Kilmashann, Ireland.....	do.....	do.....	do.
Church, London-road, Newport.....	do.....	do.....	do.
Five Houses, Loxford Hall Estate, Hereford.....	do.....	do.....	do.
Hotel, Regent-road, Morecambe.....	do.....	do.....	do.
Offices, Tay street, Perth.....	do.....	do.....	do.
Hotel, Ac. Union, Northants.....	G. V. Bethell.....	G. V. Bethell, 225, West George-st., Glasgow.....	do.
Colts Ovens and Chimneys.....	Nummery (Yorks), Colliers Co. Ltd.....	Nummery, 225, West George-st., Glasgow.....	do.
Pole Station, Ac. Cl. potters, Sheffield.....	do.....	do.....	do.
Nine Houses, Industry street, Walsley.....	do.....	do.....	do.
Street Works.....	Hanley Corp.....	Hanley, 225, West George-st., Glasgow.....	do.
*Offices, Oldham.....	Prudential Assurance Co. Ltd.....	Prudential, 225, West George-st., Glasgow.....	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Clerk, Surveyor's Department.....	Poplar B. of W.....	12s. rising to 15s. per annum.....	Oct. 24

Those marked with an asterisk (\*) are advertised in this Number. Competitions, pp. iv, vi, viii, & xxi. Contracts, pp. iv, vi, viii, & xxi. Public Appointments, pp. xviii, & xxi.

Apparatus, 21, 22, 23, S. Howard, Sewage Destructor  
 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

SOME RECENT SALES OF PROPERTY:  
 ESTATE EXCHANGE REPORT.  
 September 30.—By F. H. B. RIDDLE.  
 Kenilworth Town—33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348,



## PRICES CURRENT OF MATERIALS.

£830

100

30,100

27,000

11,030

650

550

675

390

385

395

400

605

390

71,100

470

450

340

210

585

500

250

4,200

640

930

330

330

360

470

260

515

390

445

395

865

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570

390

350

445

600

585

375

295

610

3,525

1,170

2,700

10,000

11,500

1,500

395

400

570



## LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders:—

<b>BLTYHE-ROAD</b> —Erecting school. Boys, 240; girls, 240; infants, 295; total, 775. Also schoolkeeper's house, with cookery centre and science-room under.	
J. Allen & Sons.....	£25,107
J. Cammichael.....	21,511
J. & M. Patrick.....	21,499
J. Grover & Son.....	21,188
Leslie & Co., Ltd.....	21,186
F. & H. F. Higgs.....	21,071
Lathey Bros.....	£20,533
E. Lawrence & Sons.....	20,237
W. King & Son.....	20,010
B. E. Nightingale.....	19,876
W. Johnson & Co., Ltd.*	19,851

<b>BEN J. JONSON</b> —Providing additional heating to new classrooms and rearranging apparatus on ground floor.	
J. Fraser & Son.....	£1,553
J. Eason.....	379
J. Grundy.....	356
J. & F. May.....	365
Dargue, Griffiths, & Co., Limited.....	£251
W. G. Cannon & Sons.....	245
E. Oldroyd & Co., Limited.....	243
Wenham & Waters, Ltd.,*.....	30

<b>DETMOLE-ROAD</b> —Providing and fixing boiler and extending existing low-pressure hot-water apparatus, and providing hot-water radiators in three corridors, and coil in cloak-room:—	
A. H. Skinner & Co., Ltd.....	£230
H. C. Price Lee & Co.....	205
C. Myn, Ching & Co.....	198
W. G. Cannon & Sons.....	178
G. Davis.....	178
Vaughan & Brown.....	£156
Stevens & Sons.....	147
Duffield & Co.*.....	225

<b>GORDON HOUSE, ISLEWORTH</b> —Providing and fixing dry-lug horses:—	
J. D. Barry & Sons.....	£298
J. Fraser & Son.....	288
J. & F. May.....	252
W. G. Cannon & Sons.....	180
J. Wootton-Smith, Gray, & Co.....	£172
Wenham & Waters, Ltd.,*.....	154

<b>HAGUE-STREET</b> —Providing girls' and infants' offices, refectory, boys' offices, altering and refitting lavatories, and providing new drainage scheme:—	
G. S. S. Williams & Son.....	£2,320
E. Lawrence & Sons.....	2,170
Marchant & Hirst.....	2,157
T. Crawley.....	2,148
Lathey Bros.....	£2,747
Stevens & Sons.....	2,044
Johnson & Co.*.....	2,042

<b>INVICTA-ROAD</b> —New school—Boys, 307; girls, 308; infants, 249. total, 965, with schoolkeeper's house.	
J. D. Barry & Sons.....	£24,591
J. & M. Patrick.....	24,624
Holliday & Greenwood.....	24,528
W. Downs.....	24,489
J. Cammichael.....	24,189
G. E. Wallis & Sons.....	23,797
Kirk & Randall.....	23,440
E. Lawrence & Sons.....	£23,445
W. Johnson & Co., Ltd.....	21,740
F. & H. F. Higgs.....	20,841
J. Marsland.....	20,365
Treasure & Son.....	20,111

<b>OAKFIELD-ROAD</b> —Erecting school. Boys, 292; girls, 292; infants, 23. total 617, with schoolkeeper's house and manual training centre:—	
Assigned.....	£19,208
J. Cammichael.....	17,118
Kirk & Randall.....	16,762
Stimpson & Co.....	16,113
F. & H. F. Higgs.....	15,113
Treasure & Son.....	14,113
E. Lawrence & Sons.....	13,113
G. E. Wallis & Sons.....	12,113
S. Hart.....	11,113

<b>OLDFIELD-ROAD</b> —(Enlargement)—Providing and fixing auxiliary heating in three new classrooms and corridors in connection with existing low-pressure steam apparatus:—	
J. Fraser & Son.....	£213
J. Eason.....	193
J. & F. May.....	183
W. G. Cannon & Sons.....	182
Wenham & Waters, Ltd.....	95
G. & E. Bradley.....	£23
J. Grundy.....	77
J. Wootton-Smith, Gray, & Co.....	71
J. Deanes & Sons, Ltd.,*.....	60

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 99, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.  
Telephone No. 24 Holborn. Telex Address "SNEWIN" London.

<b>FURRETT ROAD</b> —Exterior painting:—	
Thomas & Edge.....	£225
J. H. Hodgkin.....	240
C. Holding & Son.....	239
C. Foreman.....	238
W. Hayter & Son.....	£198
W. Banks.....	154
J. Deanes & Sons, Ltd.....	143
E. Proctor.....	135

<b>SIDNEY-ROAD</b> —Providing and fixing steam boiler, &c.:—	
Dargue, Griffiths, & Co., Limited.....	£284
J. Fraser & Son.....	57
Duffield & Co.....	210
J. Lason.....	205
J. & F. May.....	45
W. G. Cannon & Sons.....	£435
J. Deanes & Sons, Ltd.....	423
J. Grundy.....	390
Wenham & Waters, Ltd.,*.....	317

<b>WOLVERLEY-STREET</b> —Exterior painting:—	
J. F. Holliday.....	£291
Johnson & Co.....	285
G. Barker.....	210
S. H. Cornfield.....	197
* Accepted.	

## TO CORRESPONDENTS.

G. S.—H. W. A.—M. T. W. (Below our limit).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return printed communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum (13 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS BOURNINIERI) should be addressed to the publisher of "THE BUILDER," No. 48, Cannon-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (13 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles &amp; Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY,  
LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,  
GREENHOUSES,WOODEN BUILDINGS,  
Bank, Office, & Shop Fittings.

## CHURCH BENCHES &amp; PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## THE BATH STONE FIRMS, Ltd.

BATH,  
FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

## HAM HILL STONE.

## DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Traik & Son  
The Doulting Stone Co.)

Chief Office:—Norton, Stoke-under-Ham,  
Somerset.

London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava  
Asphalte Company (Mr. H. Glenn), Office, 42,  
Poultry, E.C.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-rooms,  
granaries, tun-rooms, and terraces. Asphalte  
Contractors to the Forth Bridge Co. [ADVT.]

SPRAGUE & CO., Ltd.,  
LITHOGRAPHERS AND PRINTERS.

Estate Plans and Particulars of Sale promptly  
executed.

4 & 5, East Harding-st., Fetter-lane, E.C. [ADVT.]

## QUANTITIES, &amp;c., LITHOGRAPHED

accurately and with despatch.

**METCHIM & SON**, 67, GERRARD ST. WESTMINSTER.

"QUANTITY SURVEYORS" DIARY AND TABLES, &c.  
For 1899 will be ready shortly. [ADVT.]

## Ernest Mathews &amp; Co.

61, St. Mary Axe, E.C.

SLATES, SLAEWORK,  
Enamelled Slate,  
Marble,  
Permanent Green Slates.

WORKS:  
Bow, London, E. and  
Aberllefenny, North Wales

BRANCH HOUSE:  
37, Victoria-street, Bristol.

## PILKINGTON &amp; CO.

(ESTABLISHED 1839),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.

Telephone No., 2751 Avenue

Equators & Trade Mark.

## Polonceau Asphalte

PATENT ASPHALTE and FELT ROOFING.  
ACID-RESISTING ASPHALTE.

WHITE SILICA PAVING  
SEYSSSEL ASPHALTE.

BRICKMASTERS' EMPLOYERS' LIABILITY  
ASSOCIATION, LIMITED.

## DIRECTORS.

**CHARLES CREMER, Esq.,** Faversham, Kent, Brick Manufacturer.  
**R. L. CURTIS, Esq.,** 120, London-wall, E.C., Brick Manufacturer.  
**GEO. H. DEAN, Esq., J.P.,** of Smeed, Dean, & Co., Limited, Sittingbourne, Brick Manufacturers.  
**E. W. GOODENOUGH, Esq.,** 37, Walbrook, E.C., Brick Manufacturer.  
**A. J. KNIGHT, Esq.,** Rainham, Kent, Brick Manufacturer.  
**HY. PACKHAM, Esq.,** of Wills & Packham, Limited, Sittingbourne, Brick Manufacturers.  
**A. RUTTER, Esq.,** of D. & C. Rutter, Parliament-street, Brick Manufacturers.  
**J. WILLSON, Esq., J.P.,** of Willson Bros., 7a, Southwark-street, S.E., Brick Manufacturers.  
**GEO. E. WRAGGE, Esq.,** of Eastwood & Co., Limited, Lambeth, S.E., Brick Manufacturers.

Secretary.—**E. J. COLEBY, Esq.,** 148, Gresham House, Old Broad-street, E.C.



# The Builder.

VOL. LXXV. No. 2908.

OCTOBER 29, 1896

## ILLUSTRATIONS.

Wall and Ceiling Decoration for Room at Walsingham House.—By Mr. Cesare Formilli ..... *Double-Page Ink-Photo.*  
House at Fleet.—Mr. Howard Ince, Architect ..... *Double-Page Ink-Photo.*  
Design for a Convalescent Home: Architectural Association Silver Medal Drawings.—By Mr. F. Dare Clapham ..... *Double-Page Ink-Photo.*  
South Porch of St. Nicholas, King's Lynn.—Drawn by Mr. George J. J. Lacy ..... *Single-Page Photo-Litho.*  
A Private Chapel, Matlock Dale, Derbyshire.—Mr. E. Guy Dawber, A.R.I.B.A., Architect ..... *Single-Page Photo-Litho.*

## Blocks in Text.

Blocks Illustrating the Dangers of Hot-Water Heating Apparatus ..... Page 376, 377

Examples of Seventeenth Century Furniture ..... Page 380  
A Private Chapel, Matlock Dale. Plan ..... 386

## CONTENTS.

The Dangers of Hot-water Heating Apparatus .....	375	Central London Railway .....	384	Obituary .....	388
Notes .....	377	Decorations for Room, Walsingham House .....	386	General Building News .....	388
Gondalming Municipal Buildings Competition .....	379	House at Fleet .....	386	Sanitary and Engineering News .....	391
Examples of Seventeenth-Century Furniture .....	380	Design for a Convalescent Home .....	386	Foreign .....	391
Vaults, etc., Used in Building Structures by Wool Workers .....	380	South Porch of St. Nicholas, King's Lynn, Norfolk .....	386	Miscellaneous .....	391
.....	380	Private Chapel, Matlock, Derbyshire .....	386	Capital and Labour .....	391
The London County Council .....	381	Competitions .....	386	Legal .....	391
The Royal Institute of British Architects .....	383	Applications under the 1894 London Building Act .....	387	Meetings .....	392
Architectural Societies .....	383	Books Received .....	387	Recent Patents .....	392
Archaeological Societies .....	384	The Student's Column: Sound, Light, and Heat.—XVII. ....	387	Some Recent Sales of Property .....	393

### The Dangers of Hot-Water Heating Apparatus.



OW that winter is once more approaching it may be of service to reconsider the dangers attaching to apparatus for heating buildings by hot water. The subject is not a new one, but attention to it is necessary so long as accidents continue to occur; it can, moreover, be illustrated by examples which have not yet received adequate notice in our columns. Last winter was so mild that not a single heating apparatus boiler, we believe, exploded in this country in consequence of frost; we must, therefore, turn to the winter of 1896-7 for our illustrations.

While thus insisting on grave dangers arising from frost, we do not lose sight of the fact that accidents may occur to hot-water heating apparatus even in mild weather, and an example of this kind will shortly be given; but we shall be within the mark if we say that nine out of every ten accidents are directly due to frost, and it is for this reason that special attention will now be devoted to explosions occurring when some portion of the apparatus is rendered inoperative by reason of the contained water being frozen into solid ice. Without entering into any rivalry with "Old Moore," we may also utter a word of warning to the effect that in all probability the coming winter will be characterised by severe frosts, and that therefore great care should be exercised by all persons in charge of hot-water heating apparatus; certainly it would be strange to have two such mild winters in succession.

On November 30, 1896, the boiler of a low-pressure heating apparatus, used for warming a portion of Brookfield Mill, at Kirkburton, near Huddersfield (Yorkshire), exploded, and was projected, by the force of the explosion, a distance of 30 ft., tearing up the warming pipes, demolishing the brick chamber in which it had been placed, wrecking a wooden shed against which it fell, and killing the foreman of the works. The boiler was only thirteen months old, and was of the saddle type, as shown in fig. 1, constructed of  $\frac{3}{8}$  in. wrought-iron plates

welded together; it measured 3 ft. 6 in. from front to back, 2 ft. 2 in. in width, and 2 ft. 6 in. in height. The back of the boiler was blown off by the explosion, giving way at the weld, and being bent into a concavo-convex form, while the sides of the boiler near the back were also distorted.

On January 18, 1897, a heating boiler at the Sandell Works, 215, Selhurst-road, South Norwood, London, S.E., exploded after having been in use only one winter. The brick house, in which the boiler was placed, was completely demolished, as well as the boiler itself, and one man was severely injured. This boiler was of less common form, the water-way being an annular chamber of peculiar shape and of small size, as shown in fig. 2; the extreme outside dimensions were only 19 $\frac{1}{2}$  in. by 13 $\frac{1}{2}$  in., and 9 $\frac{1}{2}$  in. deep, while the water space was only 1 $\frac{1}{2}$  in. wide and 7 $\frac{1}{2}$  in. deep. The boiler was of cast-iron about  $\frac{3}{8}$  in. thick. As might have been expected from the nature of the material, the explosion burst the boiler into a number of fragments.

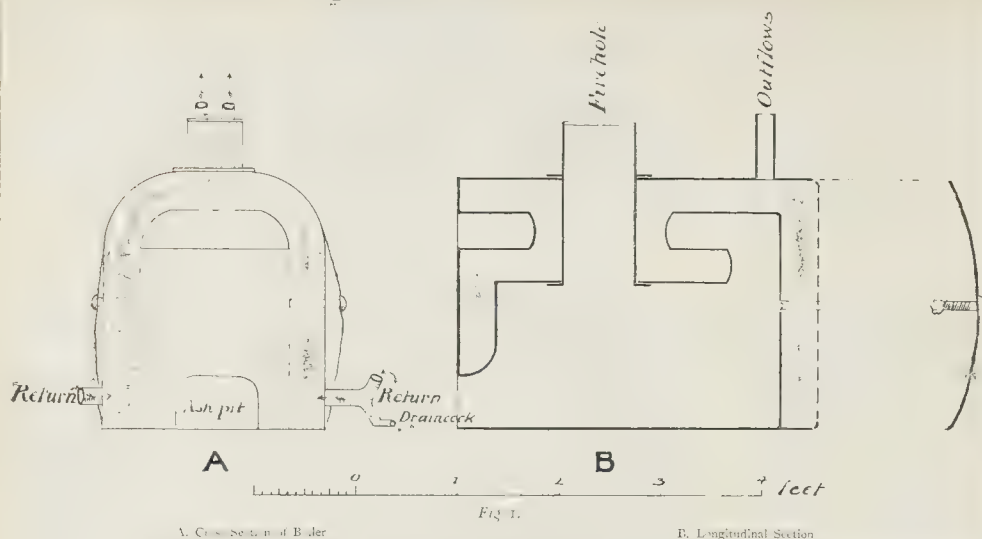
A third case occurred at six a.m. on Sunday, January 24, 1897, at the Prospect Primitive Methodist Chapel, Swindon (Wiltshire). This again, as shown in fig. 3, was a saddle boiler, but of simpler form than that at Kirkburton, but was about the same age, having been fixed new in January, 1895. The dimensions were: length, 3 ft.; width, 1 ft. 10 in.; height, 1 ft. 7 in. The outer and inner plates of the saddle were  $\frac{1}{4}$  in. thick, welded together at the bottom curves, and the end plates were  $\frac{3}{8}$  in. thick, welded to the saddle plates. The explosion lifted the boiler from its seat and projected it through the floor of the vestry above, whence it fell back almost to its original position. Strange to say, the attendant, who was standing in front of the boiler at the time, escaped with comparatively trifling injuries. This appears to have been due to the plates yielding at the bottom, as indicated in the figure, and projecting the boiler almost vertically. Had the explosion been of the kind shown in fig. 1, the man's life would probably have been lost and the damage to the buildings would have been much more serious.

The apparatus in each case appears to have been good of its kind, as far as it went, but in none were any special precautions, except the provision of draw-off cocks, taken

to prevent such accidents. The flow and return pipes were properly connected; the pressure due to the head of water was in two of the cases only 3 lbs. per square inch, and in the third only about 6 $\frac{1}{2}$  lbs.; air-pipes were carried from the highest parts of the circulation-pipes to points above the supply-cisterns in two, at least, of the cases; and a draw-off cock was provided in close proximity to each boiler. The boilers were made by three different makers, whose names need not be mentioned, as the fault of the explosions does not rest with them. Two of the boilers were of wrought iron, and one of cast iron, while all three were more or less different in shape and construction. All the apparatus were on the low-pressure system, which is usually considered so much safer than the high-pressure.

The cause of explosions occurring on such dates as November 30, January 18, and January 24, need hardly be stated. In each case frost was the cause, the water in the circulation-pipes being frozen at one or more points. When this occurs and a fire is lit under the boiler, one of two things must happen (unless special precautions have been taken): (1) The ice will be melted or broken up by the increasing pressure of the heated water, or (2) the boiler or its connexions will burst. The possibility of the former alternative happening is small, if any considerable portion of the pipes has been blocked with ice. At South Norwood the block evidently occurred in the 6-ft. lengths of flow and return which passed *uncovered* in the open air between the boiler-chamber in the back-yard of the house and the room to be warmed. The distance of the ice from the boiler appears to have been less than 10 ft., and yet the boiler burst before the ice could be melted. When there is no circulation of water in the pipes, the water in them can only be warmed by conduction, which is a very slow process indeed, so slow that, were the block within a yard of the boiler, the probability is that the boiler would burst before the ice could be melted or broken up. With respect to the apparatus at Kirkburton and Swindon, we are not told how far the frozen pipes were from the boiler, but far or near makes very little difference.

And now a word or two as to the days on which the explosions occurred. That at the Swindon Chapel occurred on a *Sunday*, the



pipes having been left full of water during the previous week, *while the fire had been allowed to die out* on the previous Sunday or Monday. At Brookfield Mill, Kirkburton, the explosion occurred on a *Monday*, the pipes having been left full of water from the previous Friday, when the fire had been allowed to go out. At the works at South Norwood also, the accident was on a Monday, but here the fire had only gone out on the Saturday before; it must be remembered, however, that in this case, the pipes passed for a length of 6 ft., through the open air, and were not protected in any way from the effects of the external temperature. Thus we have three explosions, one occurring after seven days' disuse of the apparatus, another after three days', and the third after only two days'.

At South Norwood the fact that the pipes were frozen does not appear to have been known; but at Kirkburton the attendant, after lighting the fire, suspected that something was the matter with the circulation, and called the foreman to examine the boiler, &c., while he went for a bucket of hot water to thaw the frozen pipes; before his return the boiler exploded and the foreman was killed. That neither the attendant nor the foreman had the common sense to rake out the fire immediately on discovering that the circulation was stopped, shows either their deadly ignorance or their unfortunate lack of that inestimable quality, presence of mind. The attendant at the Swindon chapel was avowedly ignorant of the dangers of the apparatus he was supposed to control. Before lighting the fire he noticed—to quote the report—"that the supply-tank was frozen, and thought that the water in the circulating pipes was also frozen; but he did not know there was any danger in lighting the fire under such circumstances.\*" Such ignorance in a person placed in a responsible position is most culpable, and perhaps the greater part of the blame for the accident should rest upon those who appointed such a man to the post.

What lessons can be learnt from the ex-

\* The italics are ours.

amples given? Here are three boilers, different in size, shape, and material, all nearly new and in good condition, but all destroyed because the increasing pressure of the water, as it became more and more heated, could find no other way of escape. The explosion might, in every case, have been prevented either by drawing off the water when the fires were allowed to die out, or by keeping a small fire burning continuously, so that the water would always be warm and in motion. Explosions might also have been prevented by raking out the fires as soon as it was noticed that a proper circulation had not been set up. These are matters of attendance pure and simple, and every person in charge of a heating apparatus should be aware of these elementary rules.

But the construction of the apparatus was far from perfect, as not one of the boilers possessed a safety-valve. It is sometimes said that safety-valves are of no use, and certainly too much reliance may be placed upon them, but it is a simple fact that safety-valves have very often indeed prevented explosions. It is argued that the valve itself may be frozen fast. It may be, but being near the boiler, which will retain its heat longer than any other part of the apparatus—particularly if it is of the saddle type and encased with brickwork—the valve is less likely to be frozen than other parts; moreover, being so near the boiler (for it should be fixed as close to it as possible), and containing so little water or ice, it will be more quickly melted. A valve, moreover, furnishes an easy method of ascertaining the condition of the apparatus, especially if it is of the dead-weight type, as, in our opinion, all such valves should be. It would soon become a habit of the attendant to lift some of the rings of the valve before lighting the fire; if the water continued to run for some time, he might know that a fire would not be likely to do any harm, but if, on the other hand, water did not flow, he might be certain that something was wrong, and that a fire would be a source of grave danger.

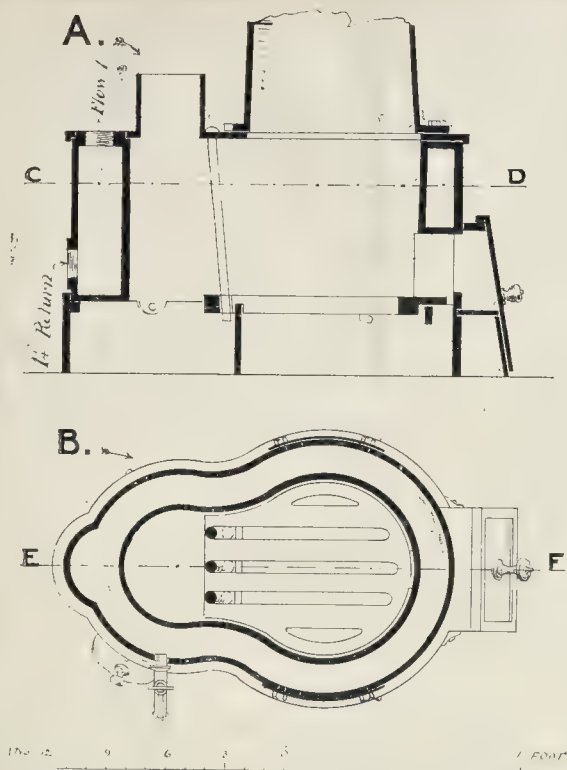
Instead of a safety-valve, a plate of mica or other material may be fitted in the boiler, if this is not encased in brickwork, care

being taken that the *breaking-strength* of the material is well within the safe *working-strength* of the boiler itself. Any undue pressure in the boiler will then be relieved by bursting the plate of mica or other material, leaving the boiler itself and its surroundings intact. In fixing such a safety-plate, care must be observed to fix it so that the escaping water, in the case of an explosion, cannot possibly reach the attendant; otherwise, he might be seriously scalded. Another danger to be feared in connexion with hot-water apparatus is when stop-valves are fixed on the flow-pipes to prevent the circulation of water in some portion of the building. In the chapel at Swindon, two 1½-in. flow-pipes were taken from the top of the boiler, one for warming the chapel and the other for the school, and on each a stop-valve was fixed. If by any chance both these valves should be closed, while a fire is burning under the boiler, the only escape for the increasing pressure in the latter (in cases where safety-valves are not provided), will be through the air-pipes at the uppermost points of the circulation, or through the supply-pipe and tank. Sometimes air-cocks are fixed instead of air-pipes, and are, of course, always closed when the apparatus is in use; in such a case, the only escape for the pressure is through the supply-pipe and tank, and a stoppage in this (whether by ice or any other substance) must lead to an explosion. Where the attendant is as ignorant as the one at the Swindon chapel, an explosion may in this way be brought about, even though the circulation-pipes are entirely free from ice or deposit.

Attention must also be drawn to the culpable carelessness shown in fixing hot-water pipes, as at South Norwood, in the open air, or, indeed, in any exposed position, without covering them with slag-wool or other non-conducting material.

It appears to us that every person fixing a hot-water heating apparatus should be compelled to fix on the boiler a suitable safety-valve or plate, and to provide for the boiler-chamber a danger notice, and that every person or persons owning the apparatus





A. Section of Boiler.

B. Plan of Boiler.

C-D. Section at E F on Plan.

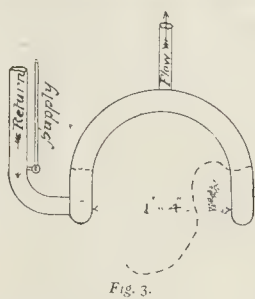


Fig. 3.

BEFORE LIGHTING THE FIRE AT ANY TIME the attendant must see that at least one circulation of pipes has its stop-valve open.

N.B.—It is possible for pipes to be blocked by incrustation or deposits as well as by frost, and the attendant must take all care to ascertain if this is likely to happen, and be prepared to act as in the case of frost.

The three apparatus which have been described were all of the low-pressure type, and in each case the explosion was due to frost. Explosions in high-pressure apparatus may also be caused by the same agency, but none appears to have been thus caused during the winter of 1896-7. The sole explosion of high-pressure apparatus was that which occurred on Sunday, November 7, 1896, at Marylebone Presbyterian Church, London, and this was due to a defect in the

apparatus itself. The installation was completed in the latter part of the previous year, and consisted of about 2,365 ft. of butt-welded wrought-iron pipes, with an internal diameter of  $\frac{5}{8}$  in. and an external diameter of  $1\frac{5}{8}$  in. The boiler was formed with coils of similar piping, about 265 ft. in all, enclosed in an iron casing lined with brickwork. The fire was lit about six o'clock on the morning of the accident, and the damper was not closed until a quarter-past eleven. Almost immediately the explosion occurred with "a loud report." The damage done was only trifling, being simply the bursting of one of the pipes on the ground floor of the church, but as it was followed by the rising of volumes of steam in the building, the wonder is that a panic was averted.

At the preliminary inquiry, held on behalf of the Board of Trade, it was stated that the apparatus had been tested on its completion in November, 1895, to a pressure of 2,000 lbs. per square inch, and that the makers did not anticipate that the working pressure would ever exceed 250 lbs. per square inch. On being tested by the Inspector, however, the pressure was found to reach 500 lbs. per square inch with only three hours' firing, and it was "still rising when the fire was checked." Fortunately, explosions of this kind are exceedingly rare, but, in the words of the Inspector, "the necessity is shown for frequently testing such pipes by hydraulic pressure, and making a forced fire-test to ascertain the maximum pressure obtainable in them before apparatuses of this description are set to work."

## NOTES.

The French Académie des Beaux-Arts met on Saturday last to elect a successor to M.

Garnier in the architectural section. At first M. Guadet had nearly all the votes, but in the process of the curious French system of "Tour de scrutin," which seems intended to give people an opportunity to change their minds after they have begun voting, after four turns M. Moyaux, "Inspecteur-Général des Bâtiments Civils," was elected by nineteen out of thirty-six votes; the remaining votes being distributed among MM. Guadet, Laloux, Girault, and Scellier de Gisors. The new Academician was born at Anzin in 1835; he became a pupil of Hippolyte Lebas, and obtained the Prix de Rome in 1861. He is an officer of the Legion of Honour and a Professor at the Ecole des Beaux-Arts. Among his principal works are the monumental fountain at Anzin, the tomb of Léon Cogniet, and the observatory at Meudon; and he was the successful competitor for rebuilding the Cour des Comptes. We presume therefore that M. Moyaux is a capable man, though it will seem rather odd to English architects that the election should have fallen on an architect little known out of France, over the head of a man of such world-wide reputation as M. Guadet; and indeed all the three other candidates are better known on this side of the Channel than the successful one.

THE correspondence in the *Times* upon the subject of Building Regulations in the Country has shown pretty clearly that some of the by-laws are really not suited to purely rural districts. There is no doubt also that in many places, and in many instances, local

should be held responsible for the maintenance of such a notice in a conspicuous position. As a contribution to this important subject, we venture to suggest the following form of notice:—

## DANGER.

TO PREVENT EXPLOSIONS, with their accompanying injuries to life and property, the attendant must, during the winter months, either

KEEP THE FIRE CONSTANTLY BURNING EVERY DAY AND NIGHT (a small fire will suffice when the apparatus is not required), or

DRAW OFF THE WATER IN THE BOILER AND PIPES immediately after raking out the fire, the ball-cock in the supply-tank being first fastened up, or the supply of water to the tank turned off by the stop-cock.

IF THE FIRE ACCIDENTALLY GOES OUT, the water not having been drawn off, care must be taken, before relighting the fire, to ascertain (1) whether the water in the supply-tank or in the pipes leading to or from it is frozen, (2) whether the safety-valve is frozen fast, and (3) whether the water in the circulation-pipes is frozen (this is most important and can be ascertained by fastening up the ball-cock in the supply-cistern, and running the water out of the boiler and pipes for some time); the ice in the pipes, &c., must be melted before lighting the fire.

If, after lighting the fire, circulation is imperfect, the attendant must AT ONCE RAKE OUT THE FIRE, and must then, and not till then, proceed to examine the apparatus, in order to discover the cause.

by-laws are more honoured in the breach than the observance, that they are not properly enforced, and that they are often of such a character that to enforce them would be unreasonable. The fact is that the whole subject requires investigation and consideration. It is undesirable that by-laws should be too elaborate. They should be simple and they should be enforced. Indeed, all over the rural districts of England, what is really most needed is a vigorous enforcement of existing sanitary regulations; hundreds of instances of inefficient sanitary supervision may be seen all over the country; in many cases sanitary inspectors in rural districts will hardly make an investigation or a report until they have been pressed to do so.

LORD IDDESLEIGH, the Chairman of the Royal Commission on Sewage Disposal, has addressed a naïve letter to the Press, in which he states that the Commission has learned that there is a tendency on the part of some manufacturers and Local Authorities to postpone the carrying out of works for sewage disposal pending the Report of the Commission. He adds that such postponement would be viewed by the Commission "with the gravest concern." He further states—what was unnecessary, since every one knows the length of time which Royal Commissions take over investigations—that some years must elapse before any final report is made. We fear that this letter might just as well have not been written. As we said when the Commission was appointed, some Local Authorities and manufacturers would certainly take advantage of it to postpone various necessary works. Such postponements will still go on, and there is a certain reason in them. It is quite possible that a Local Authority may carry out some scheme which the Commission may ultimately condemn; and it is natural that Local Authorities should not desire to spend public money whilst, rightly or wrongly, there is uncertainty as to the best principles of sewage disposal. We should much prefer that Lord Iddeleigh would make up his mind to investigate the subject rapidly and make a report within a definite time. A year would be quite long enough for the work of this Commission.

IN regard to the Note which appeared on this subject in our last issue (page 358), Mr. F. W. Stevens, who we find in England at present, while quite agreeing with us in regard to the general predominance of "P. W. D." engineers in carrying out architectural work in India, and the bad effect thereof, objects that we have done him an injustice in apparently classifying him as an engineer, inasmuch as he was educated as an architect in a well-known provincial office in England. We gladly make the correction; still the fact remains that Mr. Stevens was for many years, as we understand, in the service of the Public Works Department in India, and must have assimilated its methods to a greater or less extent; and our point is that in an architectural sense the officers of that Department, who carry out such a large part of Indian building, are out of touch with the architectural standards of (as we put it) London, Paris and Boston, and that it is almost inevitable that it should be so. Our primary interests in India have

always been those of government and administration and works of utility, as is natural in the case of a conquered country; art takes a secondary place, and considerations of economical administration are often paramount. Mr. Stevens tells us that he would have wished to employ a high-class sculptor on the building we illustrated, for instance, but he was ruled out on a mere question of cost. It is better that it should be realised that English India is quite behind the mother country in artistic standards at present. Unless that is realised there is not likely to be any move for improvement.

Rebuilding  
of Colston  
Hall.

THE Directors of the Colston Hall Company advertised in our last issue for competition designs for the "restoration and refitting" of the Hall, with the rather unusual proviso that architects were to send in their names by October 30, after which date plans and sections of the existing premises and conditions of the competition can be obtained from the Secretary. The object of this arrangement is not apparent. If the Directors intend to make a selection out of the names sent in, they should have stated this in the advertisement; some architects who might compete will not choose to offer themselves for selection. If that is not the object, what is it? Apart from this, we will offer the Directors some advice in advance. In drawing up the Instructions, let them state clearly what are the numbers of chorus and of band for which they want accommodation on the orchestra; stating band and chorus numbers separately, as the band require more standing room than the chorus; a fact often quite overlooked by architects. Secondly, they should make up their minds, and state clearly, whether they intend the large hall for a concert hall or auditorium *only*, or for use also for balls and assemblies. In the latter case the usual flat floor is a necessity; in the former case it is much better avoided. Thirdly, do not let them rashly select an assessor on the mere ground that he has already built a concert hall. A great many architects have built concert halls and built them wrongly; in fact there is scarcely a concert room in the kingdom where the orchestra is planned in the best way with due regard to practical requirements. They had better aim at making a new departure, rather than repeating existing models.

Retirement  
of  
Mr. Blashill.

AT the last meeting of the London County Council the retirement of Mr. Blashill was announced, which will take effect at the end of the year, and we are glad to see not only that very high encomiums were paid to him by some of the members, but that a substantial retiring pension is to be assigned to him. Mr. Blashill may be said to have been an ideal County Council architect, combining thorough practical knowledge with administrative and business ability and scrupulous fairness and impartiality. It will be difficult to adequately fill his place.

The Architectural  
Association  
Conversazione.

THE Annual Conversazione of the Architectural Association was held on Friday evening the 21st, at the King's Hall, Holborn Restaurant, with what we may call the usual success. The guests were received by Mr. and Mrs. Fellowes-Prynn, and there

was a numerous attendance. Among the works of art exhibited were a small collection of beautiful water-colour and other drawings by Mr. Axel Haig, and a screen of drawings by Mr. Brewer, including a pen line drawing under the title "The Water Gate," a bold towered fortification in the foreground, with a lofty city rising behind, which is one of the finest drawings of an architectural subject we have ever seen. Drawings were also lent by Sir Wyke Bayliss and Mr. Weedon. Some of the work of the Architectural Association Studio and Classes was exhibited, as usual; the drawings by the water-colour class indicated that there is a very good level of artistic feeling in this class, and that the members are being well taught in the right path of bold and free handling of water-colour. Messrs. Doulton had two stands of faience and pottery at the top of the room, and Mr. De Morgan a collection of coloured and lustre ware at the other end of the room, containing some beautiful work. The musical entertainment included a selection of pieces by Messrs. Dan Godfrey's band, varied by three insertions of four-part gleesinging, excellent both in selection and execution, and which was attentively listened to, which is not always the case at a promenade entertainment. We may suggest whether some singing of that kind, interspersed with lighter music, might not form part of the smoking-concert entertainments. Surely every one would like it better than music-hall songs.

Posthumous  
Pugin on Sale.

THE following amusing advertisement appears in a weekly paper:—

"TO BUILDERS, CONTRACTORS, AND CLERGY about to BUILD.—For SALE, a complete set of PLANS for a beautiful Gothic Church, to cost 8,000*l.* and to seat 700, by Welby Pugin, Esq., the eminent Architect. Cost 200*l.*, will sell for 50*l.* This is an unique chance to dispense with architects and their heavy professional fees, which in this case would be 400*l.*"

Then follows a statement as to where the plans may be seen, which we omit. What is so charming in this is the effort to make a flank attack on the living architects by offering a dead man's design for one-fourth its proper cost, and at the same time referring so unkindly to the "heavy fees" of this very ill-paid profession. The advertisers might have spared us that gibe, at all events. We fear that the advertisement is hardly likely to result in a "deal." Churches planned for one site will seldom suit another very well; and though Pugin was a man of genius, his Gothic is very much out of date now.

The Bridge  
House Estates,  
Finsbury-circus  
and  
London-wall.

YESTERDAY (Friday) was fixed for the letting by auction, by the Corporation, as trustees of the Bridge House Estates, of certain building sites in Finsbury and London-wall. Considerable attention was directed to the scheme by the tenants' representations that their legitimate interests are disregarded in thus dealing with the property—see the *Builder* October and November last year. The four plots cover an aggregate of 49,200 ft. superficial, with frontages of 298 ft. to London-wall, 95 ft. to Circus-place, 285 ft. to Finsbury-circus, and 69 ft. to West-street, comprising Albion Hall, and thirty-seven houses, some of which stand on the site of (old) Bethlehem Hospital, which abutted against the north and outer side of the London Wall; northwards lay Moor-



fields. The hospital, erected in 1675-6, after Robert Hooke's designs, was pulled down in 1815, and replaced by the Circus (southern side). The leases are to be granted for terms of eighty years from June 24, 1899; the lessors stipulate that the new buildings—on approval by the City Surveyor—shall be completed for occupation within eighteen months from that day, but if the property is let in one lot the limit will be extended to three years. An improvement is to be effected by setting back the London-wall frontage for about 300 ft. along its north side, between Finsbury-pavement and Circus-place, in order to widen the thoroughfare to 50 ft. The basement areas in front of all the scheduled houses in West-street, Finsbury-circus, and Circus-place are to be covered in level with the footway by pavement lights. The greater part of Finsbury (or Vynesbury) was included within the prebendal manor of Holywell, being one of the manors that formerly belonged to St. Paul's, and still give names to the stalls in the choir. On May 22, 1315, Robert de Baldok granted a lease at 20s. yearly of his prebendal manor of Finsbury, or Holywell, to the Corporation. The lease, renewed from time to time, finally expired in 1867, and the estate is now held by, it seems, the Ecclesiastical Commissioners. In the latter half of the fourteenth century the Mayors of London took the style of "Lord Mayor," and as some maintain, in virtue of lordship over the manor of Holywell, or Finsbury,

The Turners' Company Exhibition.

#### THE Annual Prize Competition in Turning instituted by the Worshipful Company of

Turners has lately been held at the Mansion House. The exhibition is a small one, and although some of the exhibits evince considerable skill, yet in point of design there is a great deal to be desired. In fact, students of this class, when left to themselves, produce works which as specimens of turning may be very well, but as specimens of design are often very dreadful. In this respect the Company might very well assist the craft by placing good designs before them, and rewarding them for their execution. The first prize of a silver medal and freedom of the Company is given for some turned newels which well deserve the prize, excepting as to design. In the metal section there are very few exhibits, and these seem to turn more on mechanism than on turning proper. The efforts of the Company are praiseworthy, but we should like them to do more for the craft by instruction, which could easily be done by equipping a workshop at the trades' training school at Great Titchfield street.

The London Sketch Club.

THIS Club, which holds weekly sketching meetings to work on given subjects, has opened its first exhibition at No. 175 New Bond-street. It consists of small sketch studies, mostly of landscape, some interiors, and a few figure subjects. The landscape sketches include some very good examples of rapid indications of broad effect, as in Mr. Champion Jones's "Eccleston Glen," Mr. Haite's "On the Broads," Mr. Tom Browne's "Kentish Lane," Mr. F. H. Jackson's "A Byeway" (a river scene at a lock), Mr. Lee-Hankey's "Tewkesbury" (the bridge, not the Abbey), "The Wheelbarrow," and "Sussex Meadows," which are all good; also "A

Path over the Hills," by Mr. Walter Fowler. Among the best of the figure subjects are those by Mr. Sauber, some pencil sketches by Mr. Phil May, "Military Types" by Mr. F. C. Hardy, &c. A good many of the figure sketches run rather towards the humorous and caricature side of things.

Grafton Gallery Exhibition.

THE exhibition of the "Society of Portrait Painters" at the Grafton Gallery hardly does very much to advance the art of portraiture. There are a few very good portraits, a few clever but eccentric ones, and a large number of mediocrities. Sir W. Richmond's "Prince Bismarck" (4) may be said to be the most powerful portrait there; Manet's "The Poet Astruc" (2), with face and hands appearing to be made of parchment, the most absurd. M. Besnard's "Mme. Rejane" (48), which we think we remember in the Salon, has the highest degree of cleverness, but is inharmonious in colour and seems wantonly coarse in the execution of the face and features. There is a full-length portrait by Mr. Whistler (5), which may be called a study in grey, with a charming little outbreak of colour in the flowers in one corner; but the face is hardly modelled at all, and we retain the old-fashioned idea that the face counts for something in a portrait, as well as the general effect. M. Legros paints what suggests the head of John the Baptist, but which is really that of M. Rodin, the sculptor (7), thrown into the middle of an expanse of raw canvas. There are a series of small portraits by Professor Herkomer, dominated by his colossal one of Tennyson; two or three admirable works by Mr. Lavery, especially the half-length of a lady (1); an "incident" portrait by Mr. Collier (58) of a lady squeezed between a piano and looking into a glass in which alone her face is seen—not very effective; a pretty portrait of a boy in cricket dress (61) by Mrs. Mary L. Waller; some hard imitations of the Reynolds school of portrait, by Mr. Ellis Roberts; two heads by Mr. Watts, in one of which, "Maud" (81), we get a real bit of colour inspiration at last (there is a great deal of very crude colour in the exhibition); one or two finely finished but hard works by M. Emile Wauters, and a portrait of Karl Blind by Mr. G. Sauter, in which the head looks as if painted in soap suds. Altogether, the exhibition is not a very satisfying or satisfactory one.

M. Puvis de Chavannes.

By the death of M. Puvis de Chavannes the world of art loses the man who was unquestionably the greatest decorative painter of his time. He made his own style and aesthetic, and was in fact a kind of "school" in himself, standing alone and apart from all his contemporaries. How far he travelled, on his own lines, from the point from which he set out, we had evidence in the early picture by him, the "Beheading of John the Baptist," exhibited lately among the French pictures at the Guildhall, which no one who knew his mature works would have thought of attributing to him, and which in fact was a mere religious picture of an ordinary type. He soon emancipated himself from that restricted domain, and soared into a region of purely ideal art, using the human figure as a symbolism of abstract qualities and conceptions, and treating and grouping his works in a large and monumental spirit and with great severity though

beauty of line, forming an ideal style for mural painting in subordination to architecture. Colour was repressed and chastened, probably from a fixed principle in regard to the conditions of wall painting. In this respect one would not perhaps wish that all mural painting should be governed by this very great reticence in regard to colour; but nevertheless the style of Puvis de Chavannes was a great one, and for mural painting has not been equalled in modern times. It is remarkable that, notwithstanding the admiration and even reverence largely felt for him among French artists, he had hardly any imitators—

"Within that circle none dared walk but lie."

#### GODALMING MUNICIPAL BUILDINGS COMPETITION.

IN deciding upon new Municipal Buildings, the Corporation of Godalming selected the site of the existing public hall, which is an old building of no particular interest, and propose to embody it in the new scheme, the front and entrances to be rebuilt in keeping with the new building. As this hall occupies nearly half the available street frontage it strikes the key note of the whole plan. The sum to be spent is 7,000l., and the additions (if we may call them so) required are—on the ground floor, a Court-room, rooms for the Magistrate, witnesses, Surveyor, Sanitary Inspector, Rate Collector, water office, and also an armoury, as the public hall is used as a drill hall; on the first floor a Council Chamber, a committee-room, and Town Clerk's offices. A fire-engine house and men's rooms are also required, but it was left to the competitors to incorporate them in the main design or put them as separate buildings with the stables in the rear. In the latter case a 10-ft. passage through the frontage to the yard south of the public hall was necessary to allow of the use of the fire engine.

Eight sets of designs were submitted, and Mr. Mountford, the assessor, has not had a very difficult task to select the first. This place has been won by Messrs. Lancaster, Stewart, & Rickards with a very successful design. They have placed the Municipal Offices on the street front south of the public hall; the court-room and its entrances are in the courtyard, entered through a 10-ft. passage on the south of the offices, with the fire house and stabling detached in the rear. The only fault to find with the excellent and simple arrangement of parts in the plan is that the lighting of the corridors is not good; but the site is a difficult one with regard to light. This design is the only one that is not cut in half by tunnelling a 10-ft. carriage way through it in the centre, an avoidance of the letter of the conditions, but a great improvement to the appearance of the design, as it allows of the whole of the rest of the front to be treated as one façade with an entrance to the Hall on the right and to the offices on the left. The façade is a delightful composition, expressing at once the purpose of the building, and getting architectural effect without going beyond the modest sum at the disposal of the architects. The drawings show a brick building with a stone cornice, wooden window casements, brick architraves, and leaded lights. A break is formed in the centre of its length by the Council Chamber projecting 3 ft. or 4 ft., supported on Doric columns, forming on the ground floor a loggia, the whole of this break is in stone. Ionic columns are introduced round the first floor windows, a deep shadow being caused by the central window being set back 6 ft. or 7 ft. into the Council Room; above this order is a high plain pediment. This plain space of stone wall is enriched by the wrought-iron work supporting a clock stretching some 10 ft. or 15 ft. over the street. Above the pediment, at the intersection of the ridges of the roof, is a wooden lantern covered with lead, a decorative feature of the design.

Godalming is to be congratulated on adding a new building to its borough so well in keeping with the old-fashioned charm of the place, and in itself an architectural design of great merit and attraction.

No other premium was offered, but in his report Mr. Mountford has placed the design by Mr. E. R. Robson second, and that of Messrs.





Examples of Seventeenth Century Furniture. Drawn by Mr. E. W. Gregory.

Ardrion & Dawson third. Mr. Robson's is a nicely-balanced design, the south angle emphasised with a gable and broken pediment, in brick with stone dressings; perhaps the fault of the outside is that it looks rather too much like a "higher grade school." The plan, unfortunately, shows an awkwardly placed staircase, and the Sanitary Inspector's office and Magistrate's room are not well lighted.

Messrs. Ardrion & Dawson show a stone building rather fussy in detail and too ornate to be possible for the money, illustrated by a charming little pencil perspective. The carriage way in the centre divides the building into two, and seems to dwarf the comparatively small façade. In the plan there is some waste of room in the matter of corridors, but there is a good central feature in the hall and staircase.

Messrs. Welman & Street send a well arranged plan; perhaps the court-room is too far from an entrance to be convenient. The outside is spoilt by the number of features introduced, and it is besides too expensive a design to be carried out at the estimated cost.

#### EXAMPLES OF SEVENTEENTH-CENTURY FURNITURE.

THESE three pieces of oak furniture were originally made for members of the families of Cavendish, Stanley, and Lumley (of Waterford) respectively. They are fine specimens of furniture of the period, and are now in the possession of Mr. William Allon, of Abbots Hill, Derby.

The following are the inscriptions and dates cut on them: A—"Richard Lumley, 1635"; B—"Charles and Dorothea Helena Stanley," and "16 Fear God and Honour ye Kinge" 76"; C—"William Cavendish, 2nd August, 1618."

The illustrations are from pen sketches by Mr. Edward W. Gregory.

**NEW BUILDINGS IN ABERDEEN.**—The Plans Committee has sanctioned the following plans of new buildings:—Dwelling-house on the south-west side of Crimon place, for Mr. William Anderson, Ferryhill-place, per Mr. Alexander Melville, C.E.; fourteen dwelling-houses on the west side of Wallfield-place, for Mr. George Duguid, builder, per Messrs. Walker & Duncan, architects; ice factory at the junction of Poynerbrook-road with Russell-road, for the Bon-Accord Ice and Cold Storage Company, Limited, per Mr. George Coatts, architect; two dwelling-houses on the west side of Sunnyside-road, at its junction with Sunnyside-bank-place, for Mr. Charles Lemmon, mason; two dwelling-houses on the north-west side of Wallfield-crescent, for Messrs. Stephen & Murray, carpenters, Bucksburn, per Mr. John Cameron, builder; shed at Pocrra, for Mr. Thomas Walker, per Mr. William Smith, architect; alterations and additions in connexion with the North of Scotland Distillery, Hardgate, for the Daluaine-Talisker Distilleries, Limited, per Mr. Charles C. Doig, architect, Elgin.

#### VARNISHES, &c., USED IN BUILDING STRUCTURES, BY WOOD WORKERS, &c.

THE various kinds of woods used in the building of a house, decoration of a room, erection of a staircase, &c., necessitate the employment of special kinds of varnish; what is suited for a soft-hearted wood will not do for a hard wood, and *vice versa*. The preliminary treatment each wood should receive before being varnished has to be adapted to each particular case, and it will be the purpose of this paper to set forth the precise treatment required in each case, according to the nature of the wood to be varnished. There is another point of consideration also, which is of great importance to all who use varnishes, and that is concerning the actual composition of the varnish in use. Since the American introduction of turpentine and linseed oil substitutes, many inferior varnishes are sold that play all sorts of pranks after being laid on wood. Rosin oil, for instance, is very often used as an ingredient in cheap varnishes, but this oil will never dry, and forms a sticky mass that the slightest heat will soften and cause to run. To counteract this action, when such substances form the components of a varnish, a quickly evaporating fluid, such as naphtha or benzine, is used; by this addition, however, the varnish thus prepared is only rendered worse, as will be seen presently. Common resin and colophony (the refuse or residuum obtained from the distillation of turpentine) is also largely used as a substitute for resins. This body acts very much like rosin oil in its non-drying nature, with the additional disadvantage that the coat of varnish when dry is brittle and pulverulent, and can be rubbed off easily. When a varnish consists of two such antagonistic bodies as rosin oil and naphtha or terebene, or some other quickly evaporating hydro-carbon, the coat of varnish will dry in streaks, leaving great fissures between, showing the wood beneath. This is due to the fact that the quickly volatile fluid forsakes the solid ingredients of the varnish before the latter have had time to dry uniformly and hard, and, as a consequence, the solid parts of the varnish contract on themselves and eventually dry up into semi-hard streaks. It is a fraud to call such an article a "varnish."

Varnishes are chiefly of two kinds, oil varnishes and spirit varnishes; the latter kind are easily prepared by any one, as they do not require special or elaborate apparatus for their production. In oil varnishes, however, a special plant is required for boiling the oil, dissolving the "gum" (it is a common but incorrect practice to call the resins used in varnish-making "gums"), and mixing the ingredients. These latter kind of varnishes are more expensive than spirit ditto, and are likewise more special in their application.

#### Spirit Varnishes.

Owing to the Explosives and Petroleum Acts no one is allowed to keep more than a small quantity of any volatile explosive fluid, such as naphtha, benzine, &c., on their premises without a licence, and before such licence is granted the premises have to be inspected to see if they are suitably constructed for the safe storage of such fluids, consequently any one who contemplates making more than a gallon of varnish at a time should satisfy himself as to the requirements of these Acts of Parliament.

As a rule the plant required by the novice for making spirit varnishes will be the following: Some two-gallon stoneware bottles, earthenware pans with covers, a closed-in stove in which can be placed the vessel in which the solids are dissolved, a few large size tin funnels over which should be stretched fine linen or other suitable filtering material arranged so as to dip slightly into the funnel, a zinc or iron trough 6 in. high which can be filled with sand and placed on the stove; this apparatus is for maintaining a constant temperature, a uniform heat, by which means the spirit or other explosive fluid in which the solids are being dissolved will not be raised to an explosive heat.

The harder resins, such as copal, amber, &c., are not easily dissolved in spirits and hydro-carbon liquids, therefore the resins usually employed in making spirit varnish are the softer kind, such as sandarac, kauri (Australian copal of a soft kind), anime, dammar, mastic, and shellac; the latter material is used in very large quantities.

#### Oil Varnishes.

The plant required in making these varnishes consists of a specially constructed boiling vessel or "gum-pot" (which is set in a brick-constructed furnace, but capable of being raised by a pulley and crane, so as to be quickly removed in the event of its contents boiling over), and receiving vessels, as already mentioned. It will not pay to make oil varnishes on a small scale for one's own use, as the expense of plant would be too great, and moreover the skill required is such as can be obtained only by long and extensive experience. To enable the reader, however, to form some idea of what the actual composition of the oil varnishes on the market are (or rather what they should be if genuine) recipes and formulæ for preparing them are included in this paper.

#### Making Spirit Varnishes.

In the following formulæ it will be best to work on some definite plan, such as the following: Select a two-gallon stone jar that can be corked tightly; into this put the solid ingredients in a finely-powdered state; on them pour the solvent fluid, and then set it in the sand bath buried three or four inches deep, but be sure quite two inches of sand remain under-



neath the jar; then gently heat the sand, and before the contents of the jar become hot, put in the cork and continue the heating until the solids are dissolved; an occasional shake up of the contents will hasten and facilitate the process. It is well not to put the cork in at once, as methylated spirit absorbs moisture, and therefore any moisture in the bottles would be absorbed and the varnish thus produced be dull; by leaving out the cork until the contents become warm the moisture will be expelled, and then by corking up the bottles the spirit will not be lost by evaporation unless the contents become very hot. It is quite safe to raise the temperature until the spirit boils, but such a heat is seldom required. If the solids are such as readily cohere or become one solid mass, such as sandarac resin, it is well to put in coarsely-pounded glass with the powdered resins, but before use all such varnish will require to be filtered through some fabric. When straining a spirit varnish it is well to tie the fabric over the top of an earthenware pan and then put a cover on while the varnish is straining, so as not to lose any of the spirit by evaporation, which would not only be a loss of material but also render the varnish too thick or viscid. If the varnish is not wanted at once it is clarified by allowing it to stand undisturbed for a week or two, and then carefully pouring off the clear fluid from the dregs.

#### Varnish for Walnut.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 1 oz. of nigrosine (for spirit)  
 1 oz. of bismarck brown red  
 24 ozs. of shellac (orange or ruby).

##### Preparation :—

Dissolve the nigrosine and bismarck brown in the spirit, and then dissolve therein by warm digestion the shellac. There are two kinds of nigrosine, one soluble in spirit, the other soluble in water; be sure and use the right kind. By varying the proportions of these two dyes, the colour or shade can be altered at will.

#### Varnish for Ebony.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 2 ozs. nigrosine (for spirit)  
 24 ozs. shellac.

#### Varnish for Mahogany.

##### No. 1 :—

100 fluid ozs. methylated spirit  
 1 oz. dragon's blood.  
 24 ozs. shellac.

Digest the dragon's blood for several days in the spirit before dissolving therein the shellac. But the colour of mahogany is better imitated by using bismarck brown red, with just a little nigrosine to tone down the redness.

##### No. 2 :—

100 fluid ozs. methylated spirit  
 10 ozs. sandarac resin  
 8 ozs. shellac  
 9 ozs. Venice turpentine  
 4 ozs. dragon's blood.

#### Varnish for Oak (Common).

This is not a spirit but a turpentine varnish, which will not bear rubbing but is a quick-drying varnish and lustrous.

##### Ingredients :—

100 fluid ozs. of turpentine  
 50 ozs. common resin

This varnish does not require straining.

#### Walnut Staining Varnish.

This and the following varnishes are for rapidly colouring and varnishing soft or hard white woods simultaneously, so as to imitate the real wood.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 3 ozs. walnut spirit stain  
 24 ozs. amber resin, powdered  
 24 ozs. shellac

Digest in the sand bath.

#### Oak Staining Varnish.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 5 ozs spirit stain  
 8 ozs. sandarac resin, powdered  
 20 ozs. shellac  
 24 ozs. amber resin, powdered  
 4 fluid ozs. methylated ether

Mix the ether and spirit together and then dissolve therein the solid ingredients by the aid of the sand bath.

#### Mahogany Staining Varnish.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 4 ozs. mahogany spirit stain  
 24 ozs. shellac  
 8 ozs. sandarac resin, powdered  
 24 ozs. amber resin

Proceed as above.

#### Ebony Staining Varnish.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 24 ozs. shellac  
 3 ozs. gum benzoin  
 5 ozs. lampblack

Digest as above, and stir up well to mix the black pigment with the gums when dissolved.

##### Another formula. Ingredients :—

100 fluid ozs. methylated spirit  
 8 fluid ozs. ebony spirit stain  
 24 ozs. shellac  
 10 ozs. sandarac resin, powdered  
 24 ozs. amber resin

Proceed as above.

All the above staining varnishes require straining before use. The spirit stains are made by dissolving suitable aniline colours in strong spirits of wine.

#### A Red Staining Varnish

is prepared from the following ingredients :—

100 fluid ozs. coal tar naphtha  
 40 ozs. common resin  
 Red oxide of iron sufficient to give the required red colour.

#### A Colourless Varnish for Wood.

##### Ingredients :—

100 to 120 fluid ozs. methylated spirit  
 80 ozs. shellac  
 7 ozs. mastic resin

Dissolve by standing in a cool place for several days, giving it a frequent shake up.

#### Varnish to Show the Grain of the Wood.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 19 ozs. orange shellac  
 12½ ozs. sandarac  
 12½ ozs. colophony  
 3 ozs. camphor

Dissolve all the solids but the colophony in the spirit, and the latter, and then put the vessel in the sand bath and heat the contents until boiling. Then filter or strain off through felt filtering bags, and give the filtered fluid twelve hours' rest to clarify before use.

A common varnish for general use is prepared by dissolving

16 ozs. of shellac in  
 100 fluid ozs. of methylated spirit

but a much better product is obtained as follows :—

##### Dissolve

48 ozs. of resin in  
 50 fluid ozs. of spirits of turpentine

and then let it stand for a few days, occasionally shaking it up, then mix with it 800 fluid ozs. of boiled oil and, after shaking, to well mix the two, let it rest in a warm place until clear, when the clear portion should be decanted, and for use thinned with turpentine as desired.

A dark varnish for light woods is prepared by digesting together at a gentle warmth :—

1 part of annatto

250 parts of methylated spirit

and then add

1 lb. shellac  
 2 lbs. sandarac resin  
 ½ lb. mastic resin  
 ½ lb. elemi

1 lb. Venice turpentine

½ lb. dragon's blood.

This may be thinned with more spirit if desired.

#### Dammar Varnish.

##### Ingredients :—

100 fluid ozs. turpentine  
 80 ozs. gum dammar  
 40 ozs. sandarac resin  
 8 ozs. mastic resin

#### Kauri Copal Varnish.

##### Ingredients :—

100 fluid ozs. methylated spirit  
 48 ozs. kauri copal  
 24 ozs. mastic resin  
 54 fluid ozs. chloroform

the two fluids are mixed and the solids dissolved therein.

#### Varnish for Wood in General.

##### Ingredients :—

100 fluid ozs. naphtha  
 10 ozs. shellac  
 6 ozs. sandarac resin  
 ½ oz. benzoin  
 6 ozs. copal varnish

Dissolve the resins in the naphtha and then add the copal varnish.

##### No. 2. Ingredients :—

100 fluid ozs. methylated spirit.  
 26½ ozs. sandarac resin  
 6½ oz. shellac  
 13½ ozs. resin  
 20 ozs. Venice turpentine

Digest at a gentle heat.

#### Transparent Varnish suitable for White Woods.

##### No. 1. Ingredients :—

100 fluid ozs. methylated spirit  
 ½ lb. sandarac resin  
 ½ lb. dammar  
 1 lb. gum thus  
 1 lb. Manila copal  
 1 lb. elemi

##### No. 2. Ingredients :—

100 fluid ozs. methylated spirit  
 30 ozs. soft kauri copal  
 4 ozs. camphor  
 8 ozs. mastic  
 4 ozs. Venice turpentine

This is a quick-drying white varnish that may be polished when hard.

##### No. 3. Ingredients :—

100 fluid ozs. methylated spirit  
 1 lb. Manila copal  
 1 lb. sandarac resin  
 1 lb. gum benzoin  
 2 lbs. gum thus

##### No. 4. Ingredients :—

100 fluid ozs. methylated spirit  
 32 ozs. sandarac resin  
 8 ozs. mastic resin  
 16 ozs. Canada balsam

##### No. 5. Ingredients :—

100 fluid ozs. methylated spirit  
 32 ozs. Manila copal  
 8 ozs. mastic resin  
 4 ozs. camphor  
 4 ozs. Venice turpentine

Dissolve the camphor and copal in the spirit before adding the other ingredients.

##### No. 6. Ingredients :—

100 fluid ozs. methylated spirit  
 40 ozs. sandarac resin  
 8 ozs. mastic resin  
 2 ozs. anime resin

##### No. 7. Ingredients :—

100 fluid ozs. methylated spirit  
 32 ozs. sandarac resin  
 8 ozs. mastic resin  
 16 ozs. Canada balsam

#### Hard Spirit Varnishes.

##### No. 1, Brown.

100 fluid ozs. methylated spirit  
 8 ozs. shellac  
 16 ozs. sandarac resin  
 4 ozs. elemi resin  
 4 ozs. Venice turpentine

##### No. 2, Brown (for common purposes).

100 fluid ozs. methylated spirit  
 12 ozs. shellac  
 12 ozs. resin

##### No. 3, Brown.

100 fluid ozs. methylated spirit  
 24 ozs. sandarac  
 10 ozs. shellac

##### No. 4, Brown.

100 fluid ozs. methylated spirit  
 24 ozs. sandarac resin  
 16 ozs. shellac

20 fluid ozs. turpentine varnish, made by dissolving brown resin in turpentine in the proportion of 1 part resin, by weight, to 20 parts turpentine, also by weight.

##### No. 5, White.

100 fluid ozs. methylated spirit  
 40 ozs. sandarac resin  
 16 ozs. gum thus

##### No. 6, White

100 fluid ozs. methylated spirit (65 over proof)  
 40 ozs. sandarac resin  
 ½ oz. camphor  
 10 ozs. coarsely-powdered glass  
 After straining, add 20 fluid ozs. of pale turpentine varnish.

## No. 7, White.

160 fluid ozs. methylated spirit  
24 ozs. sandarac resin  
8 ozs. mastic resin  
4 ozs. elemi resin

## No. 8, White.

160 fluid ozs. methylated spirit  
12 ozs. sandarac resin  
10 ozs. mastic resin  
16 ozs. powdered glass  
12 ozs. pale Venice turpentine  
10 fluid ozs. turpentine varnish

## No. 9, White.

160 fluid ozs. methylated spirit  
18 ozs. sandarac resin  
8 ozs. mastic resin  
2 ozs. turpentine

## No. 10, White.

160 fluid ozs. methylated spirit  
32 ozs. sandarac resin  
8 ozs. mastic resin  
4 ozs. elemi resin  
10 ozs. Strasburg turpentine

All the above hard varnishes can be polished when dry and hard. They should be laid on with a brush used always in one direction, so as not to generate froth, for if they do, they dry dull and lustreless; 24 hours is usually sufficient time to allow them before proceeding to polish.

## Soft White Varnish.

160 fluid ozs. methylated spirit  
24 ozs. sandarac resin  
16 ozs. gum elemi  
4 ozs. anise resin  
2 ozs. camphor

## White Shellac Varnish.

160 fluid ozs. methylated spirit  
24 ozs. freshly-bleached shellac.

If the shellac is not freshly bleached it will not readily dissolve, and if it be not perfectly dry the varnish made therefrom will be dull and cloudy.

Shellac varnish may be bleached by the use of animal charcoal as follows:—

Dissolve 24 ozs. orange shellac in 160 fluid ozs. methylated spirit, and then mix with it 32 ozs. of animal charcoal and warm the mixture for ten minutes by the aid of a sand bath, then test a little by filtering. If not quite light enough, add more charcoal, and when sufficiently colourless, filter off the whole for use.

## A White Spirit Varnish.

160 fluid ozs. methylated spirit  
54 ozs. pale Manila copal  
18 ozs. Dammara resin  
18 ozs. bleached shellac  
54 ozs. toluol.

Coloured varnishes of any colour may be produced by colouring any of the above varnishes with any suitable aniline dye soluble in spirit. It is a good practice to keep a stock of a quart or pint of spirit deeply coloured with the dye, and then add a sufficient quantity of the coloured spirit to the made varnish to produce the colour desired. The dye woods may also be used in the same way—viz., by digesting them for several days in the spirit, straining and keeping the strained fluid for use as above. A pint or quart of each colour should be kept in stock, and then by mixing these as required any tone of colour can be obtained for staining wood or varnishes.

## Spirit Varnishes with O.I.

Some spirit varnishes are mixed with oil, in which case it is usual to dissolve the solid ingredients separately, and then mix the fluids therewith. To effect the melting of the resin by heat, the apparatus used in oil varnishes is required.

These varnishes are prepared by melting the solid resin in a copper vessel until fluid, then adding hot linseed oil (not boiled with litharge or any other lead salt), and, after mixing these materials, turning the compound into another vessel, which can be heated, and boiling the mixture until all cloudiness disappears, and the mass can be drawn out into strings when pinched between finger and thumb. When this point in the heating of the mixed oil and resin is reached, then the mass is ready for the thinning process, which is effected by the addition of turpentine. As this fluid is volatile and very inflammable, the oleo-resinous mass should be allowed to cool somewhat before adding the turpentine, and the mixing should always be conducted in some place where there is no fire

or naked light. There is always risk of a conflagration in the making of oil varnishes, and therefore the buildings in which the operations are carried out should be constructed with this contingency in view. More explicit details for preparing oil varnishes are not here given on that account.

## Formulae for Oil Spirit Varnish.—Ambr Varnish.

## Ingredients:—

3 lbs. of amber resin (chip amber of a pale colour)  
3 lbs. of pale copal  
3 lbs. of sandarac resin

are put into the gum pot (*i.e.*, the vessel in which the resins are melted) and heated until fluid; meanwhile 18 lbs. of linseed oil is heated (but not boiled or it will become decomposed), and this is run in on the melted resin. The mixture is stirred and then run out into another vessel where it is boiled until stringy, and when cooled enough to safely admit the addition of turpentine sufficient of that fluid is added to bring the mass to the right consistency.

## Cabinet Makers' Varnish.

8 lbs. sandarac resin  
4 lbs. boiled oil

Boil until the mass is stringy, and then thin with 12 lbs. of turpentine.

## Kauri Copal Varnish.

8 lbs. of pale kauri copal  
4 lbs. boiled oil

12 lbs. turpentine  
Prepare as last recipe.

## Pale Copal Varnish.

8 lbs. of Sierra Leone copal  
4 lbs. boiled linseed oil  
14 lbs. turpentine

Prepare as above described.

## Oil Varnishes.

These are prepared from oil that has been boiled with some drying agent, such as litharge, zinc sulphate, borate of manganese, and require very careful and skilful attention in their preparation.

The oil has to be carefully boiled under certain conditions with the drying agent, the "gums" have to be melted in a separate vessel, and the compounding of the ingredients for producing a perfect varnish needs the exercise of skill that is acquired only by experience. As already stated, only the practical varnish-maker can undertake the production of such varnishes to be remunerative. The following formulae, however, will put the reader in possession of the composition of such varnishes.

A dark oak varnish is prepared from the following ingredients:—

42 gals. of raw linseed oil  
15 lbs. of flake litharge  
15 lbs. of sulphate of zinc  
164 lbs. of kauri gum  
36 gals. of turpentine

The oil is first boiled with the litharge and zinc sulphate until it is sufficiently boiled to a linseed oil varnish, the gum is melted in the gum pot, the boiled oil mixed with it, the mixture boiled until stringy, and finally the mass is thinned with the turpentine.

A pale oak varnish is prepared from the following ingredients:—

40 gals. raw linseed oil  
15 lbs. litharge  
132 lbs. kauri gum  
48 lbs. hard copal  
36 gals. of turpentine

Prepared as in last recipe.

A cabinet varnish is prepared by melting

28 lbs. of gum anime,  
then boiling this with  
14 gals. of heated raw linseed oil,  
until stringy, then mixing with  
11½ gals. of turpentine

A "carriage" varnish, which is the general name given to varnishes that are used in the building trades, is prepared as an oil varnish from the following ingredients:—

42 gals. linseed oil  
15 lbs. litharge  
60 lbs. kauri gum  
60 lbs. anime  
60 lbs. copal resin  
40 gals. turpentine.

Mineral turpentine varnish is made by digesting altogether:—

1 gal. mineral naphtha  
1½ gals. turpentine  
18 lbs. pale resin  
7 lbs. Venice turpentine  
2 lbs. boiled oil.

Flattening varnish consists of melting 8 lbs. anise resin, mixing 2 gallons of oil, and then of boiling the mixture for 4 hours, and then thinning with 3½ gallons of turpentine.

## Wainscot Varnish

consists of:—

8 lbs. anise resin  
3 gals. clarified oil  
4 ozs. litharge  
4 ozs. dried white copperas  
4 ozs. dried sugar of lead  
5½ gals. of turpentine

Prepare as in oak varnishes.

## Body Varnish.

8 lbs. anise resin, best  
2 gals. boiled oil  
3½ gals. turpentine

Prepare as in last recipe.

## Elastic Hard Varnish.

8 lbs. copal resin  
2 gals. of oil  
4 ozs. dried sugar of lead  
3½ gals. of turpentine  
8 lbs. anise resin  
2 gals. of oil  
4 ozs. dried copperas  
3½ gals. of turpentine

Prepare each varnish (a and b) separately, and then mix the two and incorporate by boiling together.

## Hard Church Oak Varnish.

8 lbs. kauri gum  
3 gals. of oil  
5½ gals. of turpentine

Dissolve the gum in the gum-pot, heat the oil, and mix the two until the mixture strings well, and finally thin with the turpentine.

## Pale Oak Varnish.

8 lbs. gum copal  
3 gals. oil

Melt the copal and mix with the oil, then add 4 ozs. of dried copperas  
4 ozs. dried sugar of lead  
4 ozs. litharge

Boil the mixture until it strings well and thin with 5½ gallons turpentine.

## Pale Copal Varnish.

8 lbs. palest copal resin  
2 gals. pale boiled oil  
5½ gals. turpentine

Melt the resin, mix with the heated oil, boil until it strings well and thin with the turpentine.

## THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Chelsea Vestry 8,000*l.* for paving works; the Islington Vestry 22,500*l.* for electric lighting purposes; the St. Martin's-in-the-Fields Vestry 2,860*l.* for paving works; and the Camberwell Guardians 14,250*l.* for alterations and additions to the workhouse.

**New Tramways Department.**—The General Purposes Committee brought up a report dealing with the new Tramways Department. It was pointed out that the new institution would have to deal with all matters relative to tramways acquired or to be acquired by the Council, in connexion with which many important questions would in the near future arise. The Committee recommended that a Chief Officer of Tramways should be appointed, at a salary of 1,500*l.* a year, and that an advertisement should be issued inviting applications for the appointment. After some discussion, during which amendments were put forward to reduce the proposed salary, the recommendations were agreed to.

**The Superintending Architect.**—The report of the same Committee contained the following paragraph:—

The Council, on October 26, 1897, passed the following resolution:—"That, as the retirement of Mr. Blashill would cause inconvenience to the public service, he do continue to hold his appointment for another year, as from December 8 next." The year being about to expire, we have again had the matter under consideration. Mr. Blashill was appointed by the late Metropolitan Board of Works in February, 1887, and has thus served eleven years. Mr. Blashill attained the age of sixty-five years in



December, 1895, and is, therefore, nearly sixty-eight years of age. The Council has already on three occasions extended the term of his appointment, and we feel that we should not be justified in again asking the Council to pass a similar resolution. We have accordingly directed our attention to the amount of pension which should be granted to Mr. Blashill as a recognition of the valuable and zealous service which he has rendered to the Council and to the late Board. Under the Superannuation Act, 1866, the Council can grant to an officer retiring after sixty years of age and having completed ten years' service, an annual allowance at the rate of a sixtieth of his salary in respect of each year he may have actually served. Mr. Blashill was fifty-six years old at the time of his appointment to an office when over thirty years of age on account of professional or other peculiar qualifications not ordinarily to be acquired in the Council's service, the Council may in computing the amount of his superannuation allowance, add a number of years not exceeding ten to the number of years he may have actually served. Mr. Blashill was fifty-six years old at the time of his appointment as superintending architect, and his services having been so valuable and devoted we think that the Council will wish to grant him a retiring allowance of the highest amount authorised by the statute. We may point out that a similar course was adopted in the case of Mr. E. S. W. the late Surveyor, and also in the case of Mr. Arthur Gunn, the late Comptroller of the Council. We accordingly recommend:—

(a) That a retiring allowance of  $\pounds 525$  a year, being at the rate of twenty-one sixtieths of his salary of  $\pounds 1,500$  a year, ten years being added to his eleven years of actual service, and by the fifth section of the Superannuation Act, 1866, be granted to Mr. Thomas Blashill as from December 31 next, and that up to and including that date his salary be continued to be paid at the rate of  $\pounds 1,500$  a year.

In the event of the above recommendation being adopted it will be necessary to proceed with as little delay as possible to the appointment of a Superintending Architect to succeed Mr. Blashill. We recommend:—

(b) That an advertisement be issued inviting applications for the appointment, on the usual conditions attaching to appointments in the Council's service, of a Superintending Architect, at a salary of  $\pounds 1,500$  a year.

Mr. Dew moved to refer back recommendation (a) for further consideration. There was not sufficient reason why, after such comparatively short service, the proposal of the Committee should be agreed to.

Mr. Piggoth seconded the amendment.

Colonel Rotton said that had the mover and seconder of the amendment not been new members of the Council they would have hesitated before moving the amendment. All those members of the Council who knew Mr. Blashill thoroughly appreciated the value of his services. At the time of his appointment, the compulsory retirement rule was not in force, otherwise Mr. Blashill would probably have declined to enter the service of the Council.

Several other councillors spoke of the value to the Council of the services of Mr. Blashill during the last few years.

Dr. Cadogan said that those who had had the advantage of working with Mr. Blashill during the past few years knew how ably he had carried out his duties.

Mr. Beachcroft said that the total number of the staff in the Architect's department when Mr. Blashill commenced his duties was 53; now it was 110. When Mr. Blashill was appointed his duties were almost of a supervisory character. Since then the Works Department had been established, and some of them might know how great had been Mr. Blashill's responsibility in regard to that department. He regretted that the Council could not add to the resolution some words indicating how high was their opinion of Mr. Blashill, and he (the speaker) deeply regretted that any amendment had been moved to the recommendation. He was anxious that they should all say when Mr. Blashill left them: "Well done, good and faithful servant."

On a division the amendment was defeated by 80 to 23, and the recommendations were agreed to.

**Clare Market Scheme and Holborn to the Strand Street.**—The Housing of the Working Classes Committee, in conjunction with the Improvements Committee, recommended the purchase of land, for the rehousing of people to be displaced by the Clare Market and Holborn to Strand improvements, from the Duke of Bedford at  $\pounds 118,740$ .

This was agreed to.

**Dangers of the Cinematograph.**—The Theatres Committee reported that, in view of the destruction by fire of a cinematograph apparatus at the Tivoli Music Hall, Strand, during

a performance on the 17th inst., they had again considered the question of the use of the cinematograph lanterns in places under the control of the Council. On January 25 last the Council adopted certain regulations which were framed with respect to such entertainments, but having regard to the risk of fire which was inseparable from such exhibitions, thought it was not advisable to have any settled regulations, but that licensees should, before holding such entertainments, submit full particulars to the Council in order that the proposed arrangements might be fully considered. They therefore recommended:—That the resolution of the Council of January 25, 1898, approving certain regulations respecting the use of cinematograph lanterns in premises licensed by the Council be rescinded. This was agreed to.

**Legal Proceedings.**—The Building Act Committee reported as follows, the recommendation being agreed to:—

"On May 2 last proceedings were taken by the Council at the Guildhall Police-court in respect of openings having been illegally made in the party-wall between Nos. 45a and 46a, Basinghall-street, and No. 4, London-wall-avenue. The Alderman who heard the case decided that the buildings came within the exemption specified in Section 77(1) of the London Building Act, 1894, which states that buildings shall not be united except where they are wholly in one occupation or are constructed or adapted to be so. The summonses were therefore dismissed; the Alderman, however, expressing his willingness to state a case. We are advised that it is questionable whether the Alderman has rightly construed the words 'or are constructed or adapted to be so,' and, as the question of the irregular uniting of buildings is a very important one from a fire risk point of view, and is constantly arising, we think it very desirable that an authoritative decision should be obtained upon the point raised. The Alderman has accordingly at our request stated a case for the opinion of the High Court as to whether the words in the section of the Act referred to bear the interpretation he has placed upon them. We recommend—That the solicitor do take the necessary steps for obtaining the decision of the High Court upon the case stated by the Alderman with reference to the formation of openings in the party-wall between Nos. 45a and 46a, Basinghall-street, and No. 4, London-wall-avenue."

**An Embankment Project.**—Mr. Gilbert moved: "That it be referred to the Improvements Committee to report as to the cost of making an embankment on the south side of the Thames from Westminster Bridge to Blackfriars Bridge, and that they specially report on the following points:—(a) on the desirability of retaining the whole of the property benefited by the improvement as the property of the Council; (b) on the desirability of reserving a part of the site for a large housing scheme; and (c) after consultation with the Establishment Committee, on the advisability of reserving a site at the western end of the proposed embankment for a new Council chamber and offices." In doing so, he said that he thought if the embankment was constructed they would be able to reclaim some 18 acres of land. It was at present a miserable locality, but could be made very bright and pleasant, while the Council could retain the frontage and reap all the benefits to be gained by the construction of the embankment.

No one seconded the motion, and it dropped. The Council adjourned at seven o'clock.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of the new session of the Royal Institute of British Architects will be held on the 7th prox., when the President, Professor Aitchison, K.A., will deliver an address.

The following is the programme for the session:—

November 21.—"The Comparative Value of Documentary and Architectural Evidence of English Cathedrals." By Francis Bond, M.A.

December 5.—"Fireproof Construction in America." By R. W. Gibson (New York). Under the management of the Science Standing Committee.

December 19.—(i) "The Application of Electric Power to Practical Purposes in Buildings." By H. R. J. Burstell, M.Inst.C.E. (ii) "Some Practical Hints on the Production and Use of Electricity for Lighting Country Houses." By Bernard M. Drake, M.I.E.E.

January 16.—Award of Prizes and Studentships.

January 23.—President's Address to Students. Presentation of Prizes.

February 6.—"Public Baths and Wash-houses." By A. Hessel Tiltman.

February 20.—"Municipal and Public Libraries." By J. M. Brydson and F. J. Burgoyne.

March 6.—"Some Early Christian Churches in Palestine." By A. C. Dickie. Preceded by Business Meeting, including Election of Royal Gold Medalist.

March 20.—"Norman Vaulting in England." By John Bilson, F.S.A.

April 10.—"The Application of Colour to Interior Ornament in Relief." Under the management of the Art Standing Committee.

May 1.—Annual General Meeting.

May 15.—"Nature and Architectural Ornament." By H. Heathcote Statham.

May 29.—"Planning and Construction of Board Schools." By T. J. Bailey.

June 12.—Business Meeting: Annual Elections.

June 26.—Presentation of the Royal Gold Medal.

The annual dinner will be held this year in connexion with the Birmingham Architectural Association, on Friday, December 9, at the Grand Hotel, Birmingham.

#### ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—

A meeting of this Association was held on the 18th inst., Mr. John Fairweather, Vice-President, in the chair, when a lecture was delivered by Mr. Low, his subject being "Ventilation." The lecturer pointed out how closely the sciences of heating and ventilation were allied. They could not very well be treated separately. Questions regarding the quantity of air required, the cubic space of room necessary per person, and the necessary purity of air fit for breathing, were gone into closely and clearly. Although carbonic acid gas was an impurity, it was more the presence of organic matter that rendered air unfit for breathing. One of the greatest difficulties ventilating engineers had to contend with was the difficulty of ventilating comparatively small rooms without causing a draught, and this, no matter what system was adopted. There were many different systems, but they could all be grouped under either of the headings, "Natural" or "Mechanical." Mechanical methods, again, could be subdivided into Plenum and Vacuum. Mr. Low described each system in turn, referring to different buildings ventilated by such method. The natural system was illustrated by several very interesting experiments, made with small models, and more particularly with a small model of a room. The failure of cowls as foul-air extractors was pointed out. The whole series of experiments tended to show how difficult and uncertain natural ventilation was under certain conditions and circumstances.

GLASGOW INSTITUTE OF ARCHITECTS.—The annual general meeting of this Institute was held on the 18th inst. in the Rooms, Pitt-street.—Mr. David Barclay, vice-president in the chair. Mr. C. J. MacLean read the annual report, from which it appeared that the number now on the roll, exclusive of honorary members, is seventy-two. The report proceeded:—Last year, at the request of the Corporation, representatives of the Institute were appointed to consult with a committee of the Town Council regarding the appointment of an architect for a public hall which the Corporation proposed to build in the district of Springburn. After some discussion, in which your representatives recommended the selection of an architect, it was determined that a competition should be promoted, and your representatives, with Mr. A. B. Macdonald, the City engineer, were appointed a committee to draw up the "conditions of competition." These conditions were accepted by the committee, and at their suggestion the Institute intimated its willingness that they should serve also as "conditions of competition" for other halls proposed to be erected in the Cowcaddens and Woodside and Kingston districts, recommending only that in the latter competitions the assessors or some of them should be replaced by other architects not competing. The committee, however, failed to carry the proposed conditions with the Town Council insofar as they referred to the remuneration of the successful architect, and your representatives did not feel at liberty to support the competition under such circumstances without further instructions from the Council of the Institute. It has now been determined to assist the Corporation in their effort to select the best



design from among those submitted, and leave with the Corporation the responsibility of reducing the standard professional remuneration, and the effect such reduction may have in the quality of the designs submitted. In the interests of architecture it was thought this was the most expedient course to adopt. In the report of the council, dated October, 1893, it was stated that the objections lodged by the Institute against the proposed by-laws framed by the Corporation under the "Glasgow Building Regulations Act, 1892," had been withdrawn on the understanding that it was the intention of the Town Council to prepare in a year or two a Building Act for Glasgow more thorough in character than the existing Act, and to consult with the Institute when framing the clauses. The council observe that the Corporation has recently appointed a committee for the revision of those regulations, and the council propose to put themselves in communication with the convener of the committee and refer to the previous understanding with the view of having the opinions of the Institute properly represented in the matter. The council had a correspondence with Mr. Hedley, general manager of the "Glasgow International Exhibition," 1901, regarding the conditions of competition for the buildings. While they regret that their recommendation regarding the rate of commission was not given effect to, as a result of their action it was published that the designs would be reported upon by a sub-committee composed of the professional members and the convener and vice-convener of the Building Committee, and copies of the "plan of ground" and "conditions of competition" were sent free of charge to the architectural bodies in Scotland and the North of England. The designs submitted were fourteen in number, and it must be a gratification to the Institute that both the accepted and the two premiated designs were the work of its members. The loan exhibition of R.I.B.A. prize drawings was held in the rooms from April 23 to 30 last. This year the drawings were exhibited along with the Glasgow Institute prize drawings from the School of Art and Technical College, and with the Glasgow Architectural Association prize drawings. The Council believe that the object of the joint exhibition—that of allowing local students to compare their prize work with that of London—was warmly appreciated, and that its good effects may be considerable. The following were the winners of the Institute prizes this year:—School of Art, Mr. Charles Menart and Mr. David Marshall. Technical College, Mr. Charles P. Barrett. It may be noted that a Glasgow man, Mr. James P. Fulton, gained the Aldwinkle Studentship of £50 for travel in Spain.—The council for the ensuing year was elected as follows:—Messrs. Alexander Petrie, John James Burnet, J. A. Morris, David Barclay, Alex. McGibbon, W. Forrest Salmon, Alex. N. Paterson, John Keppie, H.J.K. Bromhead, Jas. Lindsay, John L. Murray, Alex. Cullen, Miles S. Gibson, Jas. Miller, and A. B. Morrison. Mr. N. Macwhannell was elected a representative to the joint house committee. A vote of thanks to the chairman terminated the proceedings.

**ARCHITECTURAL ASSOCIATION OF IRELAND.**—The opening meeting of this Association took place on Tuesday, the 25th, when the President, Mr. Howard Pentland, R.H.A., read his opening address, some portions of which we may be able to print next week. Mr. R. M. Butler, hon. secretary, read the report of the Committee, which set out—"In considering the work of the session as a whole there must of necessity be many imperfections and defects in the working out of a scheme such as the formation of an architectural association, but regard should be had to the fact that great difficulties exist during a first session which require the expenditure of much time and energy to overcome. The hearty support accorded to your Committee by both the senior and the junior members has been such as to greatly encourage them, and leads them to anticipate for the Association a more extended field of usefulness and mutual benefit in the future. Your Committee have had under consideration the question of persons who are not members of the architectural profession engaging in practice. They have unanimously decided that any such person offering himself for membership under the second sentence Clause 4 of the Article of Constitution, as defined in the form of Application B, covenants *ipso facto* not to engage in architectural practice." Mr. Walter Doolin moved the adoption of the report. Mr. W.

Kaye Parry seconded the motion, and said the Association filled a long-felt want in their profession. The report was adopted. Mr. Albert E. Murray moved a vote of thanks to Mr. Caulfield Orpen for the admirable way he had filled the chair of President of the Association last year. Mr. George Sheridan seconded the motion, which was adopted.—A Building Construction Class has been formed, which will hold its first meeting on Thursday, November 3, at 22, Clare-street; and also a Class of Design, which will hold its first meeting at the same address on Wednesday, November 2.

**EDINBURGH ARCHITECTURAL SOCIETY.**—This Society met on Wednesday the 19th inst.—Mr. W. N. Cumming in the chair—when Mr. P. E. Nobbs read a paper on "Wrought-iron Work." The meeting took place in the workshop of Messrs. Houston & Stewart, smiths, Dundee-street, and a practical illustration formed part of the evening's work. Mr. Kinross, the honorary President, and others took part in the discussion, and the attendance was a large and appreciative one. The paper was illustrated with many drawings and photographs of various types of iron work.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—The members of the Northern Architectural Association held an excursion meeting on the 22nd inst., when a number of gentlemen were shown over the new premises in course of erection for Messrs. Robinson & Co., printers and lithographers, of Newcastle. There are five floors to the new building, which adjoins the existing premises in Clavering-place. The architect for the new premises is Mr. F. W. Rich, and the contractors are Mr. John Ferguson, brick work, &c.; Mr. Hewitson, slating; Mr. Mansell Gibson, plumbing; Mr. Wm. Ferguson, plastering; and Mr. Laidler, painting.

#### ARCHÆOLOGICAL SOCIETIES.

**LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.**—A meeting of this Society took place on Saturday, October 22, in Clerkenwell. The first place visited was the Priory Church of St. John, where the Rev. T. W. Wood described the church and its history. It was formerly the choir of the ancient Priory Church, and the square at present facing the west end was the exact site of the old church. He pointed out all traces of original work that remained—viz. the south wall and its windows, and the east end with its perpendicular window, an exact reproduction of the work of Prior Thomas Docwra. The base of one of the original columns is also to be seen. The party next went down into the Norman crypt, which extends under the whole length of the church. The floor has lately been lowered by the removal of earth and human remains, which has facilitated the restoration of some of the bays. It is intended to use the crypt as a parish room. The party next visited the Church of St. Bartholomew the Great, Smithfield, the history of which, and of the recent restoration, is familiar to our readers. The Charterhouse, the last place mentioned on the programme, was next sought, and here the Rev. W. Haig Brown, the Master, read a paper entitled "The Charterhouse in London, 1371-1898." He divided the history into three periods—the Monastery, the Mansion, and the Hospital periods. The monastery was commenced in 1371 by Michael de Northburgh, Bishop of London, and Sir Walter de Manny. The site was a piece of ground just outside the City walls, a sort of "no man's land," part of which had been used as a burial ground for victims of one of the pestilences that were frequent in those days. The house when completed was inhabited by Carthusian monks, and was named after La Chartreuse, in Savoy, the word "Charterhouse" being merely an English corruption of the French title. The monasteries of this order usually consisted of two cloisters, large and small, and in the case of the Charterhouse, the larger cloister occupied the site of the present school playground. It has now entirely disappeared, but the entrance to the Prior's cell still remains, and a portion of the original chapel is also to be seen. Another interesting remnant of the past is the pair of solid gates that still hang in the chief entrance; whilst the large Guesten Hall, or dining hall, dates back to the sixteenth century. Sir Walter de Manny did not long survive the erection of the monastery, which in 1537 passed with its revenues to King Henry VIII., who in 1545 granted it to Sir Edward, afterwards Lord North. The last Prior was executed at Tyburn,

May 4, 1535. Subsequently the premises were converted into a nobleman's residence, one of the changes effected to secure that end being the removal of the great cloister and the cells of the twenty-five monks. The little cloister, with its guesten-hall, kitchens, and other commodious rooms, was easily adapted to its new purpose, and still remains; the ancient character of this part of the premises being, however, hidden behind a modern facing of brickwork, built towards the end of the last century to preserve the original stonework. In 1505 the Duke of Norfolk purchased the place for 2,500*l.*, and spent a large sum of money on improving it, and much of what he did—notably the minstrel's gallery in the dining-hall—is still to be seen. The Duke, however, like Sir Walter de Manny, did not long enjoy the house he had beautified, for in 1572 he was executed for high treason. In 1611 the property was bought by Mr. Thomas Sutton for 13,000*l.*, and henceforward the place was neither a mansion nor a monastery, but a hospital, or a shelter for the aged and a school for the young; a comfortable home for eighty men in the decline of life, and a school for forty poor boys; and as the revenues increased the number of the men and boys should likewise do so. In 1872, to bring the history to a close, the number of boys had grown so extensively that removal was necessary, and a site was procured at Godalming, where the school now flourishes. The old site was bought by the Merchant Taylors' Company as a new home for their school in Suffolk-lane. Dr. Haig Brown then escorted the visitors over the premises and pointed out the chief features of interest. Among the scholars educated here was Thackeray, who lodged at that time in a house adjoining, in Wilderness-row (facing the Foresters' Hall), and where there is a stone tablet fixed in front of the house recording the event.

**BRADFORD HISTORICAL AND ANTIQUARIAN SOCIETY.**—The annual meeting of the Bradford Historical and Antiquarian Society was held at the Great Northern Victoria Hotel, Bradford, on Friday last week. Mr. J. A. Clapham presided. The meeting was preceded by the usual dinner. Afterwards the Hon. Secretary (Mr. Thomas Howard) presented the annual Report of the committee. Eight new members had been elected, and the present number of members is 217. After a reference to the last part of the *Bradford Antiquary*, which had been published, the Report observed that the Council felt strongly that that publication justified the existence of the Society, and redeemed it from the strictures which some critical persons were disposed to pass upon it, that it was composed of mere dilettante antiquaries. The Treasurer (Mr. W. Glossop) presented the balance-sheet, and the election of officers was announced as follows:—President—Mr. Jno. Arthur Clapham; Vice-Presidents—Mr. John Jas. Stead, Mr. Jno. Lister, Mr. Thos. Lord, Mr. J. N. Dickens, and the Rev. Bryan Dale; treasurer—Mr. W. Glossop; editorial secretary—Mr. C. A. Federer; corresponding secretary—Mr. Thomas Howard; librarian—Mr. J. B. Scolah; council—Messrs. W. M. Brookes, Jno. Clapham, G. B. Cole, G. Hepworth, T. Mitcheson, P. Poole, W. V. Rhodes, P. Ross, H. Speight, Butler Wood, S. E. Wilson, and H. E. Wroot. The Chairman then delivered an address, in the course of which he observed that the papers for the season were very interesting, and that several important excursions had been arranged. Referring in complimentary terms to the history of Bingley which had been recently published by Mr. Harry Speight, a member of the Council, he remarked that an illustration in that book represented the Runic stone which existed in Bingley Church. It had been suggested that the Society should place the stone on a pedestal, where it would be preserved from further damage.

**ELECTRIC LIGHTING, SHREWSBURY.**—Mr. W. A. Ducat recently held an inquiry at Shrewsbury, in reference to an application which has been made to the Local Government Board for authority to borrow 35,800*l.* for the purchase by the Corporation of the undertaking of the Shropshire Electric Light and Power Company, and for the extension of the works. Mr. H. C. Clarke, Town Clerk, appeared for the Corporation, and Mr. Spearman (instructed by Messrs. Sprott & Morris) for the Shrewsbury Gas Company. There were also present Messrs. T. P. Deakin (Chairman of the Lighting Committee of the Corporation), and Mr. Eddowes (Borough Surveyor).



## CENTRAL LONDON RAILWAY.

The following is the account of the work on this railway sent to us in connexion with the visit of the Society of Engineers on the 11th, as mentioned in our issue of the 15th inst. It is of sufficient interest to give entire.

The constructive work of the Central London Railway was divided into six contracts. Beginning at the West End at Shepherd's Bush, the first three contracts were let to Mr. John Price, whose work extended to the Marble Arch. From thence to the General Post Office includes two contracts, both of which were secured by Messrs. Walter Scott & Co., of Newcastle-upon-Tyne. Contract No. 6 extended from the General Post Office to the Bank, and was let to Mr. George Talbot. This includes the General Post Office station and the Bank terminus, as well as the important work beneath the roadway in front of the Mansion House.

The line runs throughout almost entirely in the London clay, the exceptions being where it passes up through the gravel at the western end, and also the length extending from Berners-street, Oxford-street, to Red Lion-street, Holborn, where the tunnels run along the line of junction between the Red Lion and the Clay. The former consist of green and red marl, patches of rock, but, not being water-bearing, compressed air is not required for the working. Air at moderate pressure was, however, used where the tunnels come to the surface at Shepherd's Bush. A part of the line which has received a good deal of consideration is that which crosses the Holborn valley and runs under the Viaduct. Here the main line keep in the Clay even in passing under the site of the old Fleet Ditch, but the dip of the ground naturally brings the line closer to the surface. In consequence of this and the superincumbent pressure of the Viaduct, it was determined to use compressed air along this section as a matter of precaution, and not with any idea of excluding water, which it was not anticipated would be met with.

The line consists of two tunnels for the up and down lines respectively. The usual diameter of these is 17½ ft. inside. Where there are stations the tunnels are enlarged to 21 ft. 2 in. in diameter, so as to take platforms, &c. There are also cross-tunnels of 17 ft. internal diameter for the purpose of connecting the up and down lines, and affording shunting facilities.

The rail-level in the stations will be 80 ft. to 90 ft. below the surface, and passengers will be conveyed to the platforms by lifts which it is proposed shall be worked electrically. After leaving the stations, the tunnel runs down at a gradient of 1 in 30 for a distance of about 300 ft., whilst the gradient in approaching is 1 in 60 for about 600 ft. This brings the stations about 10 ft. higher than the main length of line. The figures vary somewhat, but those given may be taken as general.

Starting at the surface, the first operation is the sinking of the shafts, which, in the completed work, will give passengers access to the line. In each station there are two shafts, each 23 ft. in diameter, and one of 18 ft. diameter, and as the company have taken as little surface land as possible on the line of route where land is so supremely valuable, the site is pretty well crowded, the shafts occupying about half the available area. The shafts are lined with cast-iron, and the first part is put in by bolting the segments together and sinking the rings bodily by means of weighting—balks of timber being placed across for the surface land, whilst excavation is carried on from the interior. No great weight is required to sink the rings, the gravel being fairly free as a rule. When the clay is reached, and has been penetrated for a foot or two under-pinning is started; the clay being removed to the net diameter of the shaft, and the segments lowered down and put in position singly beneath the work already in place. Each ring, as completed, is grouted at the back to fill up any space between the iron and the earth. The bottom of the shaft is sunk by 2 ft. or 3 ft. of concrete. All shafts were sunk by the aid of steam locomotive cranes.

When the shaft is finished, the head-gear, which is to be used throughout the tunnelling operations, is erected. At the Post Office station steam-winchies are used for raising and lowering the temporary cages in the shafts, but at the Bank and other stations hydraulic lifts are used, the power being taken from the mains of the London Hydraulic Power Company. At all stations every precaution is taken to avoid creating any nuisance by noise or otherwise to the surrounding householders. The clay is brought up by ordinary tubs by the cages on to a raised platform, and tipped through tumblers into the carts. The bulk of the spoil is taken to wharves on the river, to be carried by lighters to Barking, where it is being deposited for reclamation purposes. Of the iron lining for the tunnels, bricks, lime, cement, &c., about 60 loads per day of 24 hours are, on an average, sent down at each station.

The permanent passages of the stations, which will afford accommodation for passengers, leave the lifts at height of about 10 ft. above the rails. It is therefore necessary in all cases to drive a temporary passage at the level of the rails in the tunnel. These passages are of 8 ft. internal diameter, and have all been iron-lined. On the line of tunnel being

reached, a break-up is formed, and a cylindrical chamber, iron-lined, is constructed, in which to erect the tunnelling shield. This chamber, which is, in fact, the first part of the tunnel formed, is 15 ft. in diameter and 7 ft. long, being somewhat larger than the tunnel proper. In this chamber the shield is erected. The shields used in constructing the tunnels have worked admirably throughout. They are of two kinds, namely, a large shield 22 ft. 6 in. in diameter, which is used for the stations, and a smaller shield, the ordinary diameter of which is 12 ft. 8 in., although there is a slight variation in the latter, in order to meet the case of tunnels requiring to be made of larger diameter in parts of the line that are on a curve, and where, therefore, extra clearance has to be allowed to the rolling stock.

The length over all of the station shield is about 6 ft. 10 in. The shell or skin is formed of strong steel plates carefully fitted and strongly riveted together, and strengthened by two strong cast-iron rings. Each ring is made up of twenty-two segments, the joints of which are accurately machined and strongly bolted together, the front ring forming a cutting edge. The inner ring forms the main body of the shield, on which are fixed twenty-two hydraulic rams. Between these two rings comes a strong steel diaphragm plate, to further augment the rigidity of the whole. The rams each consist of a ram with its cylinder or case, and a cross-head for the end of the ram, the latter of which is formed to bed on the flange of the tunnel rings. The rams are coupled together, and are in communication with hydraulic pressure pumps by means of a series of pressure and return pipes, in which are fixed shut-off valves to each ram, so that any one or more rams may be disconnected, and the direction of the forward movement of the shield thus controlled. In these pipes are also placed two reversing valves, the use of which is to direct the flow of pressure water so as to either force the rams in or out as required. The return water from the ram cylinders is delivered back into the supply tanks of the pressure pumps, so that it is used over and over again.

The structure of the shield is further strengthened by two vertical and three horizontal stringers formed of steel plates and channels, these being strongly bolted at their ends to the body of the shield. The station-shields are provided with what are called hydraulic-erectors, that are used for lifting into position the segments of the cast-iron rings forming the tunnels, ready for bolting together in their permanent position. The erectors consist of an hydraulic lifting-cylinder pivoted on a strong centre, which is securely bolted to one of the vertical stringers. The lifting cylinder is fitted with a ram, which has a head on the end of it so constructed as to be readily attached to the tunnel ring-segments. There are two turning rams attached by chains to a wheel on the pivot of the lifting-cylinder, by which means the latter is turned to any required position. The erectors are operated by suitable valves geared up to handles conveniently placed on the floor of the shield.

The operation of the shield may be described as follows:—When the ground in front is sufficiently removed to allow the shield to be pushed forward, the water-pressure is admitted to the rams, the heads of which are against the last ring of tunnel-plates put in. As the rams move outward they push the shield forward. After they have made a full stroke, the shield has been advanced a sufficient distance to allow a ring of tunnel-plates being put together in the back portion of the skin of shield after the rams have been forced back into their cylinders. The ring of tunnel-plates is then securely bolted together and to the last ring, and the operation for the getting in of the next ring proceeded with.

The small or ordinary tunnel-shields are similar in construction to the large station shields. This skin is formed of two thicknesses of steel plates, the total length of the shield being 7 ft. The front or cutting-end is formed of a strong, circular cast-iron ring, divided in halves, on which are secured steel knives, made in short segments, and forming a perfectly true circular cutting-edge. The knives are so arranged that they can be adjusted to cut a slightly larger diameter than the body of the shield, if necessary. Behind the cutting-edge ring comes a strong bulkhead, in which is a heading-out hole 6 ft. 6 in. high by 5 ft. 3 in. wide. At the back of the bulkhead there is a strong ring of cast-iron, made in six segments, having flanges which form the joints between each segment. These joints are securely bolted together, and the ring is also well bolted to the skin of the shield. On this ring are secured hydraulic rams similar to those on the large shields, one on each segment of the ring, or six in all. These are connected by pressure and return pipes to two hand-pumps, each fixed to strong water-tanks securely bolted into the shields. The working of these rams is the same as that described for the large station-shields. The hand-pumps are fitted with compound-rams, one ram being larger than the other. The object of this is that by a simple arrangement the larger rams can be operated while the pressure required is not excessive, as is always the case when the rams are only being pumped in after having advanced the shields to their full length; and sometimes when the shield is in places where

the resistance to its progress forward is not excessive. The movement of the shield by the larger rams is naturally much faster than when the smaller ones are used. When greater pressure is necessary, the smaller rams are thrown into gear, thus making the working of the pumps lighter, but the movement of the rams is correspondingly slower. Each hydraulic ram is fitted with a shut-off valve as described for the large shield, and a reversing-valve is also used, so that the rams can be moved outwards or inwards as desired, the return water being delivered into the pump tanks as it leaves the ram cases.

In operating the ordinary tunnel-shield, after it has been erected in the chamber provided, the first thing to do is to drive a heading in advance 7 ft. or 8 ft. If the ground be hard, the whole of the clay is removed in front of the shield for the distance of one ring, or 20 in., with the exception of an annulus of from 1 in. to 2 in., which is left for the cutting-edge of the shield to take away. Before the shield is moved forward a number of pointed pieces of timber are placed horizontally in front of the shield, their pointed ends being inserted in the face, and their other ends abutting on the shield. As the latter is forced forward by the hydraulic-rams, the clay is loosened by these piles, being broken down into the heading, and the miners then get through the shield and remove the earth. When the shield has been pushed forward sufficiently far by the rams—the latter pressing against the completed end of the iron lining as an abutment—the next ring of lining is erected inside the tail of the shield, and, having been bolted up, the shield can be again moved on. The annular space between the earth and the iron lining, left by the advance of the shield—it being remembered that the ring of the lining is erected inside the tail of the shield—is filled up by grouting, which is forced through holes purposely made in the lining by means of compressed air.

The rate of progress varies from two to four rings erected per shift, or from 40 in. to 80 in. completed for ten hours' work.

The method of working the larger shield is not greatly different in principle to that of the smaller one, excepting that no advance heading is driven. The interior of this shield is divided up by two vertical girders and three horizontal platforms, and there are the rams with tables supporting the face, as already stated. The earth is removed from the face by hand, and is thrown on to the platforms, and from thence to the wagons beneath. There are the piles for breaking up the earth, as in the smaller shields. The progress is usually from one to two rings per ten hours, but the rings are 18 in. long.

At the Bank Station the general arrangement of shafts and tunnels is the same as at other stations, but the upper station or booking hall is, from its situation, of an exceptional character. By agreement with the City Corporation the station is situated below the open space in front of the Royal Exchange, the railway company constructing, for the public use, a system of subways and stairways connecting the various streets which meet at this point.

By this arrangement, pedestrians desiring to cross the roadway will be able to do so without incurring the risk and delay now so notorious.

The main or public subway which surrounds the station is 15 ft. wide, and will be lined with white tiles and lit by electricity. Under this public subway is placed another in which are arranged all gas and water of an exceptional character. This, formerly crossed the street in all directions. This will obviate the necessity of disturbing the roadway for repairs of pipes and the like.

In the central space is the booking hall or upper station of the railway, which, except that its floor level will be some 16 ft. below the street, and consequently that its roof will carry the City traffic overhead, is similar in its arrangements to the other stations of the line, and from it lifts will carry the passengers to the platform below.

**METROPOLITAN FIRE BRIGADE.**—We learn that the Fire Brigade Committee of the London County Council are actively engaged in carrying out their scheme for improvements, towards which a large sum was voted about eight months ago. New chief stations are to be built at Lee Green, Lewisham, East Greenwich, and South Battersea, together with stations at Vauxhall, Brixton Hill, Camberwell, Roehampton, Highbury, Holloway, Bayswater, Fulham, Kilburn, Limehouse, and other districts. Some existing stations—including those at Hampstead, Whitechapel, Mile End, and the Isle of Dogs—will be enlarged, and plans are prepared for new buildings at Streatham, Paddington, Islington, and elsewhere. An experimental steam fire-engine after a new kind, is to be tried, and if it is found successful, six more like it will be made; whilst fire-escapes, to be drawn by horses, are being supplied, together with a large number of additional alarm-posts for telephonical communication. At the same time steps have been taken to improve the men's quarters, and to render them more healthy and comfortable, at various stations, and to obtain data for the proposed adoption in the City of a system of double hydrants, with 4-in. supply pipes.



### Illustrations.

#### DECORATION FOR ROOM, WALSHINGHAM HOUSE.

THIS is a reproduction of a drawing by Mr. Cesare Formili, which was exhibited at the last Royal Academy, for the wall and ceiling decoration for a room at Walsingham House. The principal element in the decoration, as will be seen, is in the pictorial subjects. The distinction between the character of the wall and the ceiling picture, the first rather heavy and massed in the composition of the figures and trees, the latter treated in a lighter manner with figures floating, is well conceived, though we wish the artist had been content with the figures in the ceiling design, and omitted the objectionable treatment of architectural features in upward perspective; a frequent practice, of course, in decorative ceiling painting, but none the less a mistake.

#### HOUSE AT FLEET.

THIS house is being built for Dr. Lauder Brunton, on the verge of Victoria Hill, Fleet, and commands views over a wide range of country to the south and west.

The materials used are Rowland's Castle red brick and Brosley Tiles dark red tiles. The walls are built hollow, and the brickwork is built in cement pointed as the work proceeds.

The plan annexed to the view shows the general disposition of the rooms, but is taken from an early sketch. The actual plan has been considerably changed, especially in the hall, staircases, and kitchen offices.

The contractor is Mr. E. A. Roome, and the architect Mr. Howard Ince.

#### DESIGN FOR A CONVALESCENT HOME.

THIS design for a home for convalescents was sent in competition for the Architectural Association silver medal, and obtained the Prize.

The following were the instructions to competitors:—

"A CONVALESCENT HOME ON THE SOUTH COAST.

Accommodation to be provided for ten men, ten women, and fifteen children.

Day rooms for each sex to be on ground floor, and sleeping accommodation over. Play room and covered play shed for children. Small chapel for patients and household, with provision for twenty-five strangers and a small vestry. The position of chapel to be carefully considered with respect to the approaches from the different departments. The dining hall to be used in common, and to be used for entertainments. The entrance hall to be of good size so as to be available for use of committee and visiting doctor, as well as for waiting purposes.

The administrative department to be conveniently and economically arranged and to include sitting room and bed room for Matron.

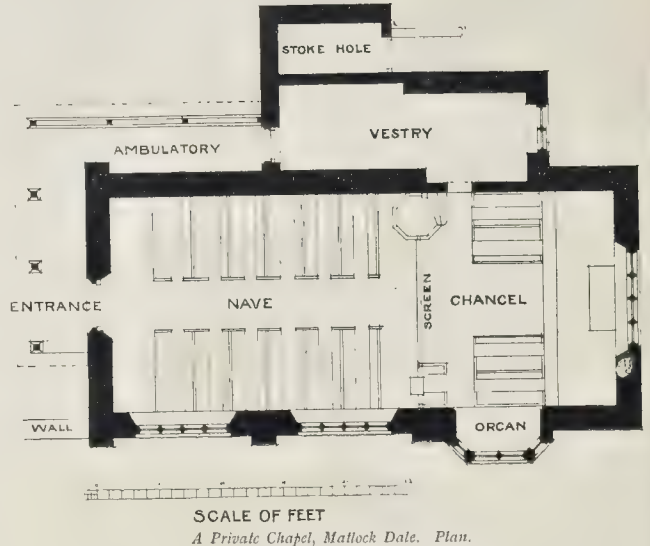
Lavatories and W.C.'s to be provided for each sex on ground floor and first floor, also bath rooms on first floor, all arranged on the best principle.

A small isolation block for sick patients to be placed in a suitable position, and to contain two wards of two beds each, with the usual adjuncts."

The materials proposed are:—Local stone for the walls, rough cast from first floor level, and green slate roofs giving a homely, simple effect and characteristic of the purpose to which the building would be put.

The author of the design is Mr. F. Dare Clapham.

We give the perspective sketch and the two principal elevations, and the ground-floor plan to half the scale of the elevations. We would willingly have given the whole set of drawings but for the economy of space we are obliged to exercise, in consideration of the great number of illustrations we have on hand. We think the design a very meritorious one; the architectural treatment has the quiet and homelike appearance which is proper to a building of this class, and the plan is well arranged in the main; perhaps the access to the dining-room is rather circuitous for the women, unless they are to use the covered way by the courtyard, which however seems more of a service corridor. In a case where there is a division between men's and women's side but they are to use the same dining-room, the best arrangement is to have the dining-room so far central that the two can approach it by separate doors from their own quarters. In



A Private Chapel, Matlock Dale. Plan.

this case, obviously, the central hall is regarded as a neutral ground where the occupants may meet, and which gives access to either chapel or dining-hall. Two separate staircases ought certainly however, to have been provided. It may be observed also that the side windows of the men's and women's day-rooms overlook each other across the court, which is not an ideal arrangement, though it may be met by filling the side windows with obscured glass. The south bay windows looking over the sea, and the sheltered verandahs facing south, are very good points. We have recently seen plans for an infirmary (by an architect in practice and not a student) where the verandahs in connexion with the day-rooms faced north; so curiously is the importance of sunshine in such cases overlooked sometimes.

#### SOUTH PORCH OF ST. NICHOLAS, KING'S LYNN, NORFOLK.

THE drawing of this fine bit of Norfolk Late Gothic work is by Mr. G. J. J. Lacy. The work is very rich in detail, and is a fine example of a class of porch of which a good many are to be found in Norfolk and Suffolk, though not all as elaborately detailed as this.

#### PRIVATE CHAPEL, MATLOCK, DERBY-SHIRE.

THIS chapel, the fabric of which was completed early in 1897, is beautifully situated high up on the side of the hill overlooking Matlock Dale and the Valley of the Derwent. Advantage was taken of an existing retaining wall, beneath which the road runs, and upon which one side of the chapel is built. Behind the hill, thickly covered with trees, slopes rapidly upwards, so that it is only from below or the hills opposite that the building can be seen.

It is built of local grit stone, with the main roof covered with old stone slates, and the bell cote and ambulatory oak shingled. The fittings and panelling inside are of oak throughout, the chancel floor of black and white marble, and in the nave under the seats wood block. Inside the walls are lined with thin red brick and the ceiling semi-octagonal in shape, treated with wide bands of modelled plaster, is now being decorated in colour by Mr. Louis Davis.

Though for some time past the chapel has been used daily, yet much remains to be done, and it will be some considerable period before the building can be said to be complete.

The main portion of the work was carried out by Messrs. Parnell & Son, of Rugby, but the later additions by Messrs. J. & W. Lewis, builders, of Matlock, together with other workers in London and elsewhere.

The architect was Mr. E. Guy Dawber, of London.

#### COMPETITIONS.

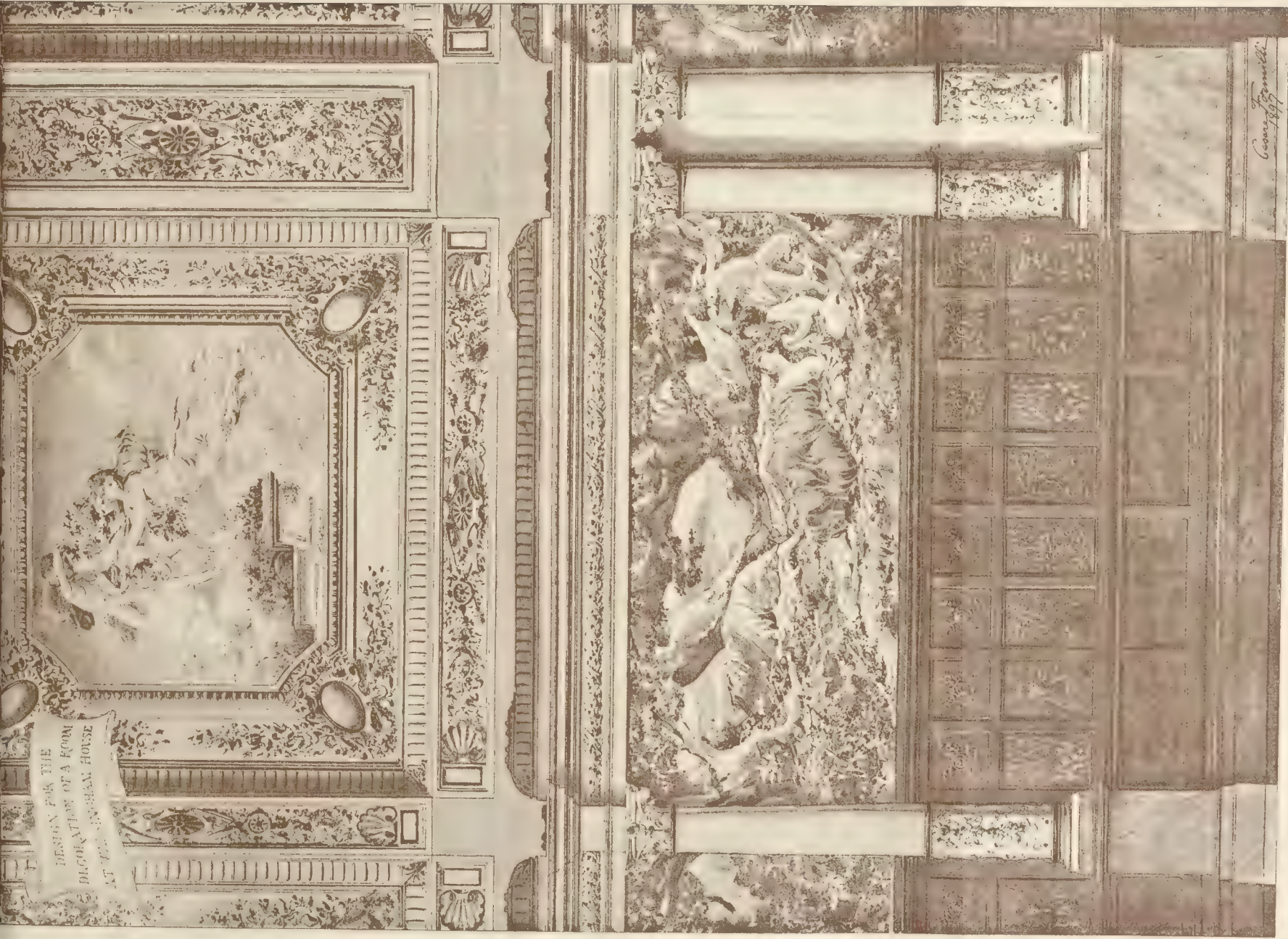
MUNICIPAL BUILDINGS, GODALMING.—IN this competition the design No. 1, by Messrs. Lanchester, Stewart, & Rickards (Bloomsbury square, London) has been placed first by the assessor; design No. 6, by Mr. E. R. Robson (Westminster), has been placed second; and design No. 2, by Messrs. Ardron & Dawson (also of Westminster), has been placed third. Mr. Mountford was the assessor, and in his Report he says "without doubt the design No. 1 is altogether superior to the other seven. It has a good plan, treated simply but most artistically both inside and out. The front elevation is extremely satisfactory." The Report, while mentioning that the authors of all the designs express the opinion that their design can be carried out for the sum allowed, adds "If you can allow more money, or omit some of the secondary buildings, it would be very advisable to do so. Municipal buildings should be, before all others, thoroughly substantial and dignified"; an opinion with which we entirely agree.

CALIFORNIA UNIVERSITY COMPETITION.—IN addition to the names of competitors given in our last, who were decided upon unanimously by the jury, some of the jurors recommended that four other designs should be purchased for possible use for the University of California. The authors of these four designs were Messrs. Joanny Bernard & Robert (Paris); Charles des Anges (Paris); Ernest Flagg (New York); and F. Skjold Neckelmann (Stuttgart).

WORKHOUSE, WEDNESFIELD.—THE Wolverhampton Board of Guardians, meeting in Committee, considered on the 21st inst. the reports which had been prepared with regard to the erection of a new workhouse at New Cross, Wednesfield. After deliberation the Board adopted the recommendations of Mr. Ald. winckle, the assessor, with regard to the plans. It was decided to recommend the Board to employ Mr. A. Marshall, of Nottingham, whose plans were awarded the first position by the assessor, as the architect for the new building; and to pay 200l. to Messrs. Mangnall & Littlewood and Mr. M. Johnson, the fees agreed upon for their plans, and 100l. to Mr. Doubleday, of Birmingham, for his plans, according to the order of merit. It was also recommended that the present farmhouse on the estate be not retained, and that a separate chapel should be erected.—*Birmingham Post*.

REBUILDING OF THE KING-STREET AREA, GLASGOW.—The result of the competition for the rebuilding of the King-street area under the new Improvement Act is announced. Three designs, titled respectively "Comfort and Economy," "Melior," and "Red Cross" were selected, and on the report of the measurer being obtained, it was decided to award the three premiums of 100l., 50l., and 50l., to the authors of the designs in the order





DESIGN FOR THE  
DECORATION OF A ROOM  
AT WALSINGHAM HOUSE

C. F. F. 1897

WALL AND CEILING DECORATION FOR ROOM AT WALSINGHAM HOUSE. BY MR. C. F. F. 1897.







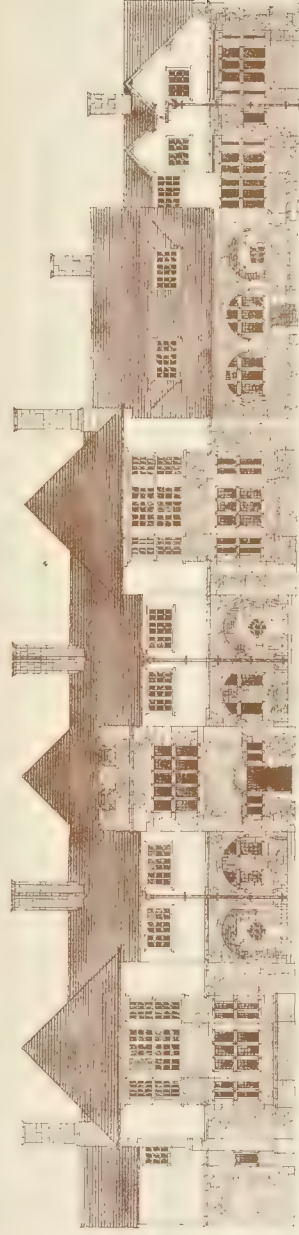
HOUSE AT FLEET MR HOWARD INCE ARCHITECT







NORTH ELEVATION.



SOUTH ELEVATION.

SCALE OF FEET.



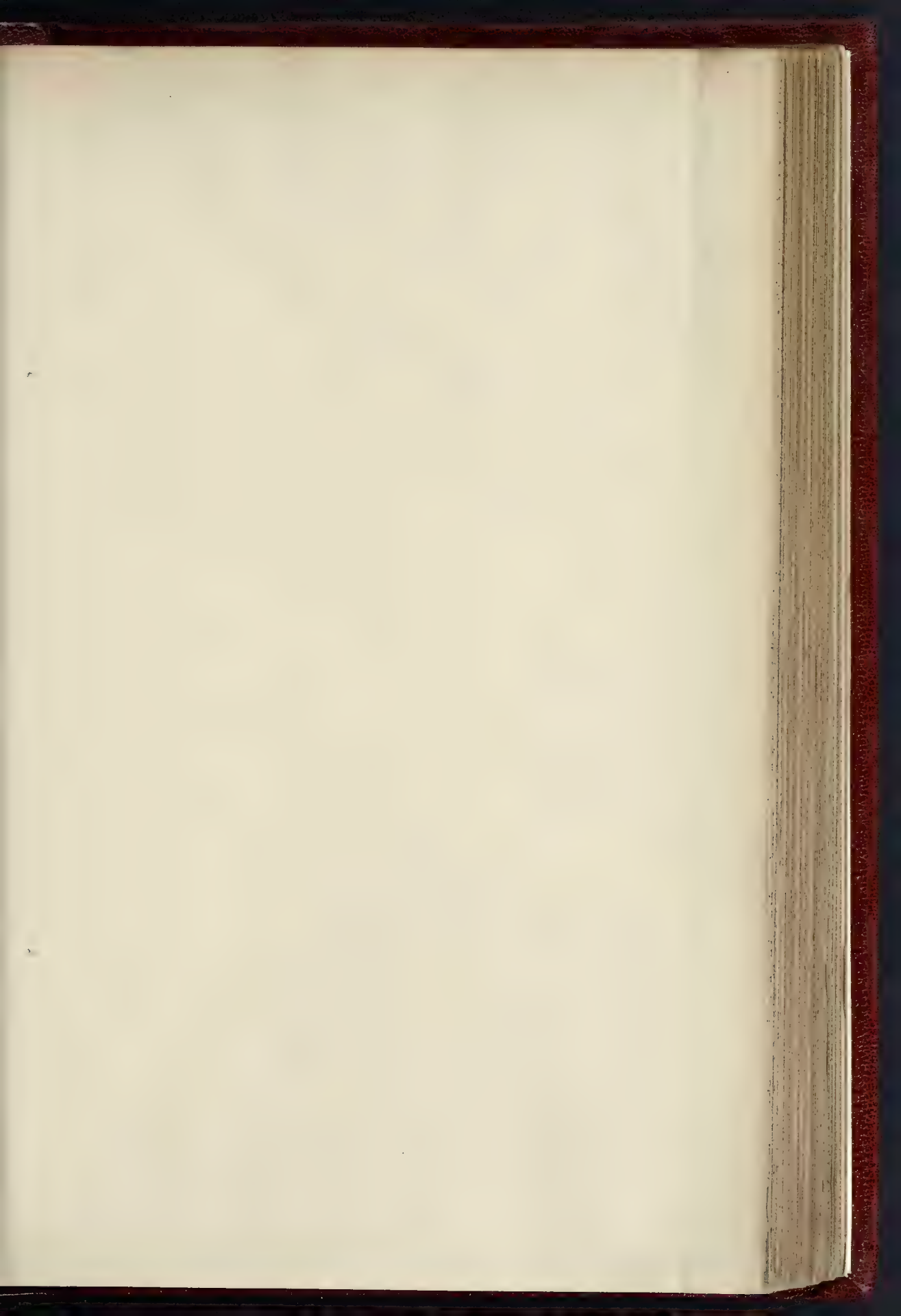
DESIGN FOR  
A  
CONVALESCENT  
HOME,

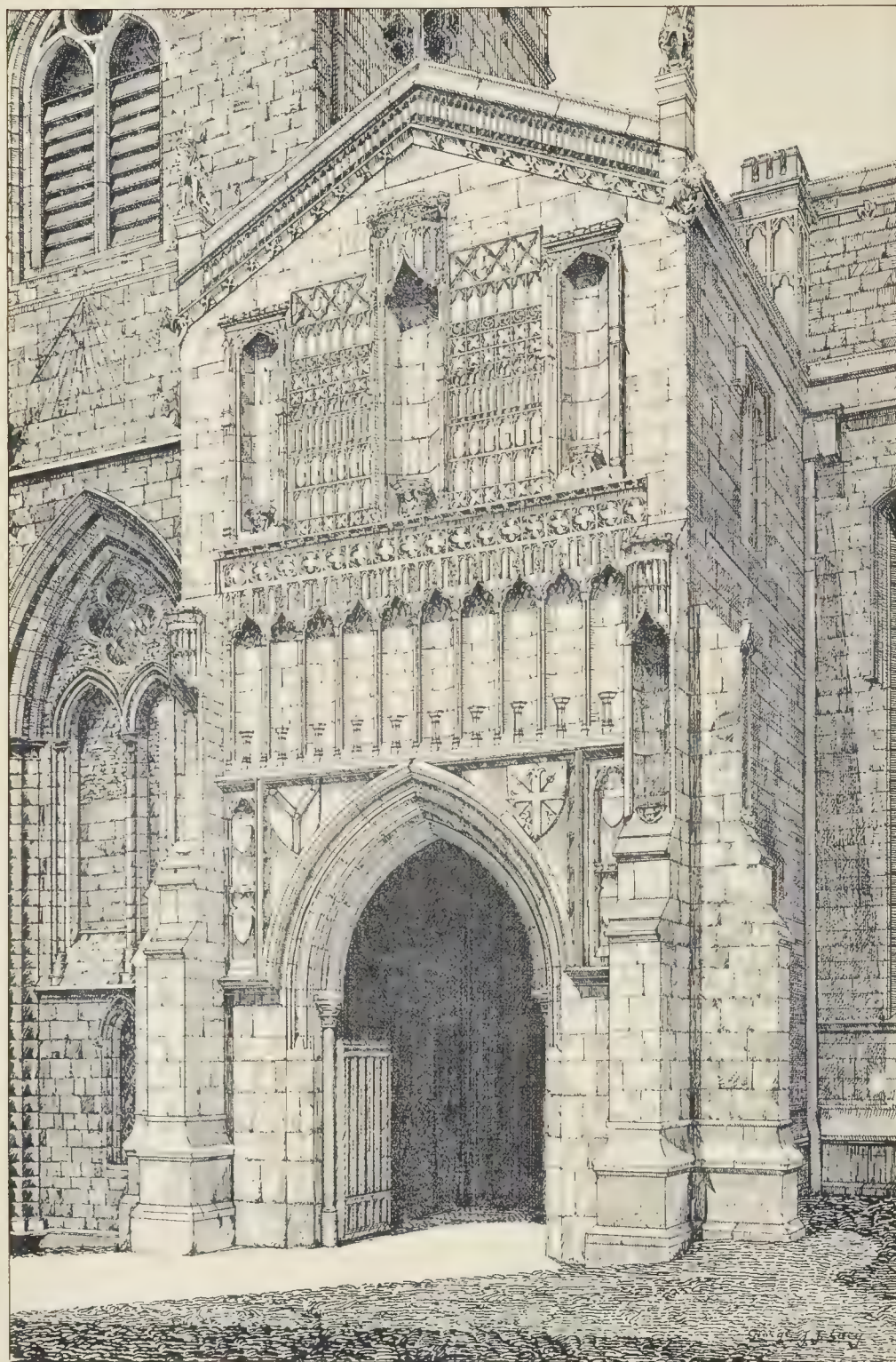
BY  
MR. F. DART CLAPHAM.

LONDON: J. B. LLOYD, 15, MARK LANE.  
NEW YORK: J. B. LLOYD, 15, MARK LANE.









SOUTH PORCH OF ST. NICHOLAS, KING'S LYNN, NORFOLK.—DRAWN BY MR. GEORGE J. J. LACY.





A PRIVATE  
CHAPEL.  
MATLOCK DALE  
DERBYSHIRE.  
E. GUY DAWBER  
Arch<sup>t</sup>

EGD 1897

PHOTO & IND. SPRAGUE & CO. 485 EAST HANING STREET FETTER LANE E.C.





named. On opening the envelopes it was found that "Comfort and Economy" was by Mr. John McKissack, 68, West Regent-street; "Meior," by Messrs. Thomas Dykes & Robertson, 65, West Regent-street; and "Red Cross," by Mr. R. W. Horn, 201, Kent-road. The Committee, after further deliberation, resolved to recommend as follows:—(1). That the area be reconstructed in conformity with Mr. McKissack's No. 1 scheme, subject to such alterations or variations thereon as the Committee may hereafter determine. The estimated cost of carrying out this scheme is 31,660*l.*, and the estimated rental from the proposed buildings is 2,990*l.* (2). That Mr. McKissack be employed as architect for the erection of the buildings. (3). That it be remitted to Councillors Chisholm (Convener), Calderwood, Dick, and M'Phun, as a special sub-committee, to confer with Mr. McKissack as to the carrying out of his scheme, and (4) that arrangements be made for the inspection of the premiated designs by such members of the architectural profession as may wish to see them.

**FIRE BRIGADE STATION, BRADFORD.**—At a meeting of the Fire Brigade Sub-Committee of the Bradford Watch Committee on the 21st inst., the instructions to be issued to architects in connexion with the invitation for competitive designs for the new fire brigade station were drawn up. The competition will be open to architects throughout the country, and the Committee are offering premiums of 100*l.*, 50*l.*, and 30*l.* for the three best designs.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

**Dulwich.**—One-story shops in front of Nos. 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, and 94, Lordship-lane, Dulwich (Mr. R. A. Hinds for the London and South Western Bank, Limited, Mr. G. H. Judd, and Mr. Castle).—Consent.

**Dulwich.**—One-story additions upon part of the forecourts of the "Walmer Castle" Tavern and No. 100, Peckham-road, Dulwich (Mr. J. W. Brooker, for Mr. G. J. Brown and Mr. J. Adams).—Consent.

##### Width of Way.

**Hackney, Central.**—A warehouse on the site of Nos. 1, 2, and 3, Grove Cottages, Grove-lane, Hackney (Mr. J. Hamilton for Mrs. Siegenberg).—Consent.

**Clapham.**—Stabling on the east side of Green-lane, Lavender Hill, Battersea (Mr. W. C. Poole for Mr. J. Stanley).—Consent.

**Kensington, South.**—An addition at the rear of the "Macaulay Arms," Silvert-street, Notting Hill, to abut upon Peel-street (Messrs. Treacher, Son, & Fisher for Mr. J. H. Davy).—Consent.

**Poplar.**—A dwelling-house on the west side of Cottage-street, Poplar, to abut upon Finch-court (Mr. J. Fox).—Consent.

##### Width of Way and Projection from Building.

**Chelsea.**—An external iron escape-staircase on the east side of the south block of the Hospital for Consumption, Fulham-road, to abut upon Arthur-street (Messrs. Karlsake & Forrester for the hospital authorities).—Consent.

##### Excess of Cubical Extent.

**City of London.**—The erection, on the north-west side of Charterhouse-street, City, of a building on the roof of the Smithfield Market electric lighting station, such new building to exceed in extent 250,000 cubic feet, and to be used only for the provision of cold storage in the immediate vicinity of the central market (Mr. C. S. Peach for Mr. J. Van den Bergh).—Refused.

The recommendation marked † is contrary to the views of the Local Authority.

#### BOOKS RECEIVED.

**DISINFECTION AND DISINFECTANTS.** By Samuel Rideal, D.Sc. (The Sanitary Publishing Company.)

**FALL OF A CHURCH STEEPLE.**—A few days ago at Felwell, in Norfolk, the tower of St. Nicholas Church, which was under repair and girt round with scaffolding, suddenly swayed and fell into the churchyard.

\* Names of applicants are given in brackets Buildings new erections unless otherwise stated.

## The Student's Column.

### SOUND, LIGHT, AND HEAT.—XVII.

#### LIGHT: SOURCES.

**M**OST of the light on the earth comes from the sun; but in lesser degree we have as natural or artificial sources, as the case may be, the stars, heat, chemical combination, electricity, meteoric phenomena, and phosphorescence. The quantity of light from the stars is not much, yet sufficient to produce many important results in photography, amongst other things. Terrestrial bodies may become light-giving when raised to a sufficiently high temperature, the light becoming brighter as the temperature is higher. In the same way, light is evolved in many chemical processes by the heat given out during chemical combination. The light yielded by various electrical processes—by friction, by voltaic batteries, by dynamical electricity, &c.—cannot be considered here, as it belongs, strictly speaking, to a branch of physics beyond the scope of this series; and we are not seriously concerned by the light yielded spasmodically by meteorites or the aurora. We may say a few words, however, on lightning, and the protection of buildings from that phenomenon. And we must go into some detail in regard to phosphorescence and fluorescence.

#### Lightning.

It is difficult to describe this phenomenon in a few words, but, briefly, we may remark that it was long ago discovered that the electricity of a thunder-cloud is identical with that obtainable from an electrical machine. In the official "Instructions" on the use of meteorological instruments observers are told that it is always found that very little electricity can be observed near the ground, and in order to obtain satisfactory indications the conductor of the electro-scope (for determining electrical state) should be brought into contact with the air at some distance from the earth's surface, by means of a collector, or otherwise. A method which has been in use for many years is where the electricity is collected by means of a flame burning at a height, either in a lantern hung to an insulated mast and connected to the electro-scope by a wire, or by a slow-burning match attached to the top of a long metal rod. The electricity of the air in the neighbourhood of the flame, by its inductive action upon the conductor, causes electricity of the opposite nature to accumulate at the upper extremity, where it is constantly carried off by the convection currents in the flame, leaving the conductor charged with electricity of the same kind, and potential, as the air.

Other means have been employed for collecting electricity, the more prominent of which are based on the method just described. One of these is known as the Thomson water-dropping collector, largely used in observations of the first order. As to the position of the collector, since electrical density is greater on projecting surfaces, and less on hollow surfaces than on planes, the collector should not be near trees or houses, nor within a closed space.

The principal results, obtained by the use of electrometers, as ascertained by Quetelet,\* are as follows:—

1. The diurnal march of electricity, at a constant height above the ground, exhibits two maxima and two minima. The maxima fall at about 8 a.m. and 9 p.m. in summer, and about 10 a.m. and 6 p.m. in winter. The day minimum occurs at 3 p.m. in summer and 1 p.m. in winter.

2. The variations of electricity precede by about an hour those of the barometric range. The maxima occur at the periods of most rapid change of temperature, whilst the day minimum coincides with the period of maximum temperature and minimum humidity.

3. The annual march of electricity presents one maximum in winter and one minimum in summer; and at Brussels, where the results were arrived at, the phenomena were found to be thirteen times more active in January than in June.

Although there are exceptions, the potential of the air is positive; clouds may be, and are, electrified either positively or negatively, and the sign of the electricity recorded close to the ground will be affected accordingly. During a

thunderstorm the changes in potential and sign of electricity are so violent and rapid that the photographic method commonly adopted has, until recently, proved almost a failure, and even now the results leave much to be desired.

Turning now to the phenomenon as a light giver, we may say that there are three principal kinds of lightning, viz.:—1, zigzag or forked; 2, sheet; and 3, globular. The first-mentioned is the discharge which takes place between two oppositely electrified bodies, or bodies differing widely in potential, and is precisely similar in character to the spark from an electrical machine. Sheet lightning is the illumination produced by distant electrical discharges; but it is occasionally produced by an actual lightning flash being discharged from behind a cloud, when only the edges of the latter are fringed with light. Globular lightning, a rare phenomenon, is a luminous sphere varying in diameter from a few inches to two or three feet, which moves slowly near the surface of the ground, remaining visible for several seconds, or even minutes, and usually disappearing by exploding with great violence.

In discussing the principles of protecting buildings against lightning, Dr. R. J. Mann† observes that when a copper conductor has been properly applied to the walls of a building its efficacy as a protection in large measure depends upon the fact that when a lightning-charged cloud hovers in the air a little distance above the top of the rod, it becomes charged with electricity of an opposite kind to that in the cloud. There is, consequently, a strong tendency for the charge in the cloud to pass into the rod, and for the charge in the rod to issue to the cloud. If in such circumstances the tension becomes so strong that the charges can leap across the intervening gap of air, a flash of lightning occurs; but as, in obedience to the direction of the tension, it goes at once into the rod, it there finds an easy path prepared for its transmission to the earth, and traverses this path without producing any mechanical disintegration between the molecules of the conductor. Such is, essentially, the service which the conductor renders when an actual stroke of lightning takes place. It affords an easy and open channel which the lightning is quite sure to take in preference to the more difficult task of making its way through the impeding and resisting structures of the building. But there is another way in which the lightning conductor also contributes to protection. It lessens the tension, and so diminishes the striking power of an approaching storm cloud. In every case the lightning-conductor is so planned that it terminates above either in a point or in a cluster of points, often arranged radially. The main stem down the building is a copper rod; and it terminates in the earth, where it is considerably enlarged in various ways, depending upon the particular conductor, so that the outlet shall be adequate. A lightning-rod with an insufficient earth contact is not only useless, but dangerous, as it is more likely to lead incidentally to severe electric discharges on the building than the latter would receive were it not provided with a conductor.

In wiring large buildings many conductors are commonly employed; in all the principle remains the same. But we have no intention of entering deeply into the matter; the student is referred for further particulars to various papers in the "Quarterly Journal of the Meteorological Society" particularly those by Dr. Mann, one of the most interesting of which will be found in vol. ii., p. 428. That society has organised conferences on the subject and published codes of rules. The history of the subject is well chronicled by Mr. Richard Anderson, in his treatise on lightning-conductors; whilst the meteorological aspect is admirably epitomised in the work of Mr. R. H. Scott, already quoted.

#### Phosphorescence.

Certain bodies are luminous in the dark, without the phenomenon being accompanied by any perceptible rise in temperature, and because this luminosity is well shown in phosphorus it is called phosphorescence. This property is to be observed in all the three kingdoms of nature, being exhibited in animals both living and dead, by vegetables, and by minerals. Mineral phosphorescence is the most interesting to us. Every architect has heard of Balmain's luminous paint, with which it was proposed, amongst other things, to paint

\* "Elementary Meteorology." By R. H. Scott. Third Edition, p. 171.

† Article in "Science for All," p. 158.



the interior of railway carriages so that, the paint absorbing the sunlight, it became luminous, and faintly lighted up the compartments on the train passing into a tunnel. The practical applications of the material are almost endless, though we do not hear much about them yet. Professor Balmain's patent was for mixing phosphorescent substances with any vehicle that will form what is commonly called a paint, wash, or varnish. If a surface coated with this paint be exposed to the direct rays of the sun, and is then removed to a dark room it shines with a violet light, and this may be done repeatedly with the same effect. This is an example of what physicists call insolation. The basis of this paint is sulphide of calcium, or Canton's phosphorus, but a number of other substances could be employed in lieu thereof. The paint may likewise be excited by holding it close to a gaslight, but it will be found that after a few experiments the paint has lost its phosphorescent property owing to the absorption of the heat rays. Commenting on this circumstance, Ackroyd observes that this antagonism of the heat radiators to the manifestation of phosphorescence after insolation was known as long ago as the year 1775. Wilson pointed out that the rays of the violet end of the spectrum, where there is least heat, cause a vivid phosphorescence in the sulphide of calcium, whilst the rays at the red end, where there is most heat, cause the phosphorescence produced by the other rays to cease. The phosphorescent sulphide of calcium was prepared by Canton by heating intensely for one hour a mixture of three parts of sifted calcined oyster-shells with one part of sulphur, whilst the original Balmain's paint was made by heating together lime and sulphur, and the product is then, for painting purposes, mixed with mastic varnish and a little turpentine. Ackroyd remarks that the nature of the light emitted varies with the method employed to prepare the sulphide, an orange-coloured phosphorescence being obtained from sulphide of calcium prepared from oyster-shells; whilst the light is much more refrangible and bluish when the sulphide is made from carbonate of lime which has been precipitated.

Other substances which become phosphorescent by insolation are the diamond, the following salts of lime—the nitrate, carbonate, phosphate, and arsenate; also sulphide of barium or Bologna stone. None of these bodies, nor sulphide of calcium, are long phosphorescent after insolation; though this latter and sulphide of strontium will yield light for 30 hours. Heat will produce phosphorescence in some bodies, such as fluor spar, a variety of that mineral emitting light at a temperature so low as 20 deg. to 25 deg. Cent.

The phosphorescence seen in tubes from which the air has been exhausted, will be fresh in everyone's mind, as the outcome of the experiments of Crookes, but that appertains more particularly to the electrical side of physics, though we shall incidentally deal with the Röntgen rays, in their applications to practical photography.

Phosphorescence may be manifested as a mechanical effect, by friction, percussion, cleavage, and the like. In the case of bodies whose phosphorescence lasts only a short time the phenomenon is experimented with by an apparatus known as the phosphoscope, by means of which bodies can be viewed immediately after being exposed to the light; the interval between insolation and examination may thus be very accurately determined. Uranium compounds present the most brilliant appearance in this apparatus.

#### Fluorescence.

This phenomenon, which is so closely related to phosphorescence as to lead some scientists to believe it to be identical, is not interesting to us so much as a source of light as a modifier of it. Many years ago Stokes made the discovery that under certain circumstances the rays of light are capable of undergoing a change of refrangibility. Ganot (*Op. cit.* p. 560) says that the discovery originated in the study of some varieties of fluor spar and also the solution of certain substances which, when looked at by transmitted light, appear colourless, but when viewed in reflected light present a bluish appearance. It appears that fluorescence is due to an absorption of certain rays; rays of light which have passed through a sufficient thickness of a fluorescent substance lose thereby the power of exciting fluorescence when they are passed through a second layer of the same substance.

The same author notes that if a few drops of a strong solution of fluoresceine in soda fall into a large beaker of water on the front of which the sun's rays fall, beautiful fluorescent clouds are first produced, and, on shaking the liquid, the whole vessel fluoresces with a bright green light. This change arises from a diminution in the refrangibility of the extra-violet rays, which are, ordinarily, too refrangible to affect the eye. Glass appears to absorb many of these more refrangible rays. Ackroyd\* observes that if the very short wave radiations which have their place beyond the violet portion of the spectrum be absorbed, we may have chemical action, as in the change wrought in compounds of silver, which is utilised for photographic purposes; and such absorption may give rise to the light emitted by such substances as Balmain's luminous paint.

#### OBITUARY.

M. POVIS DE CHAVANNES.—This great French painter died on Monday last, his death following that of his wife by only a few weeks, and being probably hastened by his grief. He was recognised as the greatest of his generation. Fuis de Chavannes was born at Lyons, on December 14, 1824. He studied successively under Ary Scheffer and Couture, whose influence was very perceptible in his early work. He soon, however, began to strike out a new path for himself, and commenced that succession of symbolical paintings in a severe and monumental style, the excellence of which was recognised by the Museum of Marseilles; in 1861, two paintings under the titles "Bellum" and "Concordia," intended for the Museum of Amiens; in 1864, "L'Automne" (Lyons Museum); in 1865, "Ave Picardie Nutrix" (Amiens Museum); in 1867, "La Guerre," "La Paix," "Le Travail," "Le Repos" (also in the Amiens Museum); in 1869, "Massilia, Colonie Grecque," and "Marseille, Port d'Orient," decorative paintings for the Marseilles Museum; in 1874, "La Victoire de Charles Martel sur les Sarrazins" and "Ste. Radegonde Donnant Asile aux Poetes," for the Hôtel de Ville of Poitiers; in 1876, "Vie de Ste. Geneviève" for the Pantheon; in 1879, "L'Enfant Prodigue"; in 1881, "Le Pauvre Rôleur" (at the Luxembourg); in 1882, "Trois Patrie Ludes" (Amiens Museum), and "Doux Pays," a decoration for the house of M. Bonnat, the painter; in 1883, "Le Reve"; in 1884, "Le Bois Sacré Cher aux Arts et Aux Muses" (Lyons Museum); in 1885, "L'Automne," a variation on the work of the same title at the Lyons Museum; in 1886, "Vision Antique," "Inspiration Chrétienne," and "Le Rhin et La Saône" (Lyons Museum); in 1887, "Décoration de l'Amphithéâtre de la Sorbonne," published in the *Builder* of July 2 of that year; in 1880, "Inter Artes et Naturam" (Museum of Rouen); in 1891, "L'Été" for the Hôtel de Ville of Paris (published in the *Builder* of January 7, 1893); in 1892, "L'Hiver," also for the Paris Hôtel de Ville; in 1893, "Décoration of the grand staircase of the Hôtel de Ville, the ceiling representing 'Victor Hugo offrant sa lyre à la Ville de Paris' (published in the *Builder* of June 2 of the same year); in 1895 and 1896, the decorative paintings for the Boston Library, consisting of "Les Muses Inspiratrices" and figures of Virgil, Æschylus, and Homer, and of History and Astronomy; in 1897, "Ste Geneviève ravitaillant Paris," for the Pantheon; and in 1898, "Ste Geneviève veillant sur la Ville Endormie," also for the Pantheon (in this year's Salon). The Amiens Museum possesses also other works of his—"Le Moissonneur," "Le Désolation," &c. This partial enumeration of his principal works only, nearly all of them on a very large scale, gives some idea of his immense labour. Theophile Gautier said of him that in an era of prose and realism, he remained epic, heroic, and monumental. Another French critic, Paul Mantz, happily remarked that with him painting ceased to be noisy and became calm, and "le silence des contours permet de percevoir plus aisément le murmure de la Pensée." With all his genius, Fuis de Chavannes was a quiet, modest, retiring man, but also a man of the greatest elevation and dignity of character, and much endeared personally to those who knew him in private life.

M. LENEPEVE.—France has lost another eminent painter by the death of M. Lenepeve, at the age of seventy-nine. Jules Eugene Lenepeve was born at Angers in 1819, and was a pupil of Picot. In 1869 he was elected a member of the Institute in place of Hesse, and in 1876 was appointed Director of the French School at Rome. His greatest work, and that by which he is best known, is the decoration of the ceiling of the Paris Opera House with the subject "Les Heures du Jour et du Nuit." He also carried out at the Paris Opéra the painting in which had been allotted to Baudry. Among his other works may be mentioned "Les Martyrs aux

Catacombs," at the Luxembourg; the "Vierge au Calvaire," in the museum at Nantes; "St. Saturnin," "David Crowned by Samuel," "Christ in the Praetorium," "Alexander and his Physician," (in the museum at Angers). He painted twelve pictures for the chapel of the Hospice at Angers; he also decorated the chapel of St. Denis in the church of St. Louis, the chapel of Ste. Anne in St. Sulpice, and one of the transepts of Ste. Clothilde. The Prefecture at Grenoble possesses also four pictures by him, symbolising the four seasons.

Mr. J. F. FAWCKNER.—On the 19th inst. Mr. J. F. Fawckner, architect, died at his residence, Park-place, Newport, from syncope. The deceased gentleman, who was in his seventieth year, was head of the firm of Messrs. Habershon & Fawckner, architects to the Tredegar Estate. Mr. Fawckner was a native of Devon, and his home was in the neighbourhood of Bideford. He served his articles with Mr. W. G. Habershon, of London, and in 1857 he was sent to Newport to take charge of the Newport branch of the firm's business. He was ultimately taken into partnership, and for many years the firm had offices in London, Cardiff, and Newport, but on the death of Mr. Habershon, which occurred some seven years ago, Mr. Fawckner became the head of the firm, and the London office was given up. Mr. Fawckner leaves a widow and two sons and two daughters. Both the sons are partners in the firm Habershon & Fawckner.—*South Wales Daily News.*

Mr. J. DARLINGTON.—On the 20th inst. the death occurred of Mr. Jos. Darlington, of the firm of Messrs W. & J. Darlington, builders, contractors, &c., of Hexham. The deceased, who, along with his brother, Mr. Wm. Darlington, had been in business about thirty years, was in his sixty-seventh year.

#### GENERAL BUILDING NEWS.

PARISH CHURCH, SWANSEA.—On the 20th inst. the Archbishop of Canterbury re-consecrated the Parish Church of Swansea, which has been rebuilt at a cost of between £25,000 and £30,000. The old church was so dilapidated that it was impossible to attempt any satisfactory work of restoration. The nave only dated back to about 1730, and, though the chancel and tower were probably about fourteenth or fifteenth century work, they possessed no features of sufficient value, it is stated, to hinder the much-needed rebuilding of the entire church. The old building was also too small, and in many parts unsafe. The new church, in the Early English style, was commenced in December, 1895. The nave was opened in August, 1897. The tower, which is up about 35 ft., is to be finished next spring. The nave has been lengthened at the west end by 26 ft., is 60 ft. in height to the ridge, and 5 ft. higher than the old tower. The new tower will be 85 ft. high, an increase of 30 ft. upon the old tower. The accommodation will be increased by about 300 sittings, all on the ground floor. The new chancel is the same length as the old one, viz., 58 ft., the east and north walls and those of the Herbert chancel standing on the lines of the old ones, but as it was necessary to widen the chancel to suit the new nave, the south wall and those of the tower and vestries are on new lines, but relatively to the chancel in much the same position as the old ones. As in the case of the nave, local stone has been used for the wallings, with Bath stone dressings. The chancel stalls, which include a special canopied seat for the bishop, are of oak, also the roofs and the vestry fittings. The monuments, both ancient and modern, have been retained, and as far as possible have been refixed in or near their old positions. The architect was Sir A. Blomfield.

CHURCH, BEXHILL-ON-SEA.—A new church (St. Stephen's) is being erected at the Down, Bexhill-on-Sea. St. Stephen's Church is situated at the north-west corner of the Down in Gunter's-lane. The building is to be of brick, with tile roof and Bath stone mullions, &c. Its dimensions will be 125 ft. from east to west, by 60 ft. wide at the nave and 85 ft. at the transept. The portion of the tower now to be erected will be about 40 ft. above the ground level. When the tower and spire are completed the height will be 120 ft. from the ground level. The cost will be about 7,000. Mr. H. E. Crutenden is the builder, the architect being Mr. H. Ward, of Hastings.

RE-OPENING OF CATHOLIC CHURCH, DUBLIN.—On the 16th inst. the Church of St. Teresa, Clarendon-street, Dublin, was re-opened after renovation and decoration. The whole of the decoration has been carried out by Mr. J. Clarke, under the supervision of Mr. W. H. Byrne, architect, Dublin.

RE-OPENING OF THORNGATE CHURCH, NEAR NORTHWICH.—On the 14th inst. this church was re-opened after restoration. The architect has been Mr. Lacey, diocesan surveyor, the builder Mr. Blyth, of Foulsham.

CHAPEL, ST. MARY'S SCHOOL, READING.—The foundation-stone of a new Chapel has just been laid at St. Mary's School. Mr. Charles E. Pooting, of Marlborough, is the architect.

RE-OPENING OF NEWBIGIN CHURCH, NORTH UMBERLAND.—For some time past the ancient church of St. Bartholomew, Newbigin-by-the-Sea, has been in the hands of the restorers, and the work

\* "Science for All."—Fluorescence, p. 188.



has now been finished. The gallery has been removed, and the west end of the nave thrown open. The altar has been placed in its old position at the middle of the west end. A vestry and organ chamber have been erected north of the chancel. The ancient walling has been stripped of its plaster and yellow wash. Choir seats have been supplied, and a dwarf screen erected beneath the chancel arch. The altar has been raised by two new stone steps, and behind it the reredos has been now completed. Mr. Simon Allen, of Newbigin, was entrusted with the work, under the superintendence of Messrs. Hicks & Charlewood, architects, of Newcastle.

**THE COMPLETION OF TRURO CATHEDRAL.**—At a recent meeting of Truro Cathedral Building Committee, the financial report was read. It showed that after payment of the cost of the foundations, amounting to 1,983*l.*, there remains in hand available for the building of the nave nearly 27,500*l.* A letter was read from the architect announcing that the whole of the working drawings for the nave, exclusive of the towers, would be ready by the end of the present month. The Committee decided that Mr. Pearson should instruct a surveyor to take out quantities and prepare specifications. It is probable that a meeting will be held in January to invite tenders for the building. The Committee have requested Mr. Pearson to prepare sketches of the interior of the nave, east and west, as well as of the west front, indicating the proposed section that has been suggested should be the limits of the present undertaking.

**CHURCH EXTENSION, WOOD GREEN.**—The memorial stone of an extension of St. James's Presbyterian Church, High-street, Wood Green, has just been laid. A new aisle and gallery are to be erected, providing further seating room for about 160 persons, at a cost of 2,000*l.* Mr. Arnold is the architect, and Mr. Say, of Wood Green, the builder.

**PARISH CHURCH, CAINSCROSS, GLOUCESTERSHIRE.**—The new chancel at Caincross Parish Church has just been consecrated, together with other improvements consisting of new chapels, font, windows, and an enlargement of the organ. The architect was Mr. W. Plank, and the building contract was secured by Mr. Cook, of Pakenhill.

**BAPTIST CHAPEL, FORD, DEVONPORT.**—The memorial stones of this building were laid on the 12th inst. The building will have a frontage on Alfred-road. The main front will have a gable, with a five-light tracery window, and will be flanked on either side with turrets. The seating accommodation on the ground floor will be for 480. When galleries are added there will be additional accommodation for 235 more. Inside, the chapel will be over 60 ft. long and 50 ft. wide. In front of the rostrum is placed the baptistry, which is to be lined with white-glazed bricks. Two vestries are provided, together with an organ chamber and choir seats. Heating is to be supplied by means of hot-water pipes. The roof is to be open timbered, and the pews will have modern pitch-pine ends. The plans were prepared by Messrs. Wible & De Boineville, of Plymouth, and the contractor is Mr. W. Partridge, also of Plymouth, whose contract was 2,552*l.* 5*s.*

**FREE CHURCH HALL, SHAWLANDS, RENFREWSHIRE.**—The memorial stone of the hall of Shawlands Free Church was laid on the 13th inst. The hall, which is estimated to cost 2,000*l.*, is situated at Shawlands Cross. It is intended to build a church on the ground between the hall and Pollokshaw's-road. The principal elevation of the hall faces a street now being formed. The side walls are divided into five bays, three of them being filled with one-light windows, the other two having two-light windows. The roofs are to be covered with Aberfoyle green slates, finished with red tiled ridging. The hall will provide for 500 sittings. It is being built from designs by Mr. John Hamilton, architect, the style being Gothic.

**WESLEYAN CHAPEL, MEERSBROOK, SHEFFIELD.**—On the 18th inst. the new Wesleyan school chapel, Meersbrook, in connexion with the Sheffield Brunswick Circuit, was opened. The school-chapel is 64 ft. by 29 ft., and with the two adjoining vestries provides accommodation for 350 people. Near the new chapel there is sufficient land upon which to build a large chapel in the future. The architects are Messrs. Helmsoll & Paterson, the builder Mr. A. Moore, the joiners Messrs. Bolsover Bros., and the plasterers Messrs. Hodkin & Jones.

**FREE CHURCH, CARNOCK, NEAR DUNFERMLINE.**—The memorial stone of this church was laid recently. The church is being erected from plans prepared by Mr. Andrew Scobie, architect, Dunfermline. It will be a Gothic structure with accommodation for 300 sittings, besides a small hall at the back and other accommodation. The contractors for the work are—William Templeman, mason, Cairneyhill; David Graham, joiner, Dunfermline; Muir & Gillan, plumbers, Dunfermline; McGregor & McOwan, slaters and plasterers, Dunfermline; and Alex. Lowe, glazier, Dunfermline; and the entire cost is not expected to exceed 1,100*l.*

**UNITED PRESBYTERIAN CHURCH, HURLFORD, Ayrshire.**—A new United Presbyterian Church at Hurlford was opened on the 15th inst. The church is Gothic in style, and is seated for about 400. While an adjoining hall has accommodation for 100. The

cost is estimated at 2,700*l.* The architect was Mr. G. Andrew, Kilmarnock.

**WESLEYAN DAY SCHOOLS, PAULTON, SOMERSET.**—New Wesleyan Day Schools have been opened at Paulton. Messrs. Keeling & Sons, of Timsbury, have erected the building from plans prepared by Mr. W. F. Bird, of Midsomer Norton. The building is of one story, built of local stone with freestone dressings, and has an open timbered roof. The fittings are of pitchpine, and accommodation is provided for 320 scholars. All the floors are of wood blocks. The building is heated throughout with hot water apparatus provided by Messrs. J. Crispin & Sons, of Bristol, but in the two infants' rooms open fireplaces are provided in addition.

**TABERNACLE, HERNE HILL.**—The foundation stone of the new tabernacle in course of erection in the Winterbrook-road, Herne Hill, has just been laid. The building is of red brick, capable of holding some 500 persons. The builders are Messrs. W. J. Mitchell & Sons, of Dulwich. The architect is Mr. Charles Barry, of Westminster; and the clerk of the works is Mr. W. H. Thomas.

**WHITEFIELD CHURCH, TOTTENHAM COURT-ROAD.**—On the 21st inst. Dr. Joseph Parker relaid the foundation stone of the old tabernacle in Tottenham Court-road, which was laid by George Whitefield in 1756. The new buildings will comprise a church capable of seating 1,150 people, and a hall to be called after Toplay, which will accommodate 800 persons. Mr. Roland Plumbie was the architect.

**RAGGED SCHOOL, BLACKBURN.**—On the 8th inst. the new Ragged School, Bent-street, Blackburn, was opened. The architects of the building, which has cost 3,000*l.*, were Messrs. Briggs & Wolstenholme.

**CATHOLIC SCHOOLS, MARKET WEIGHTON.**—The laying of the foundation stone of the Roman Catholic schools at Market Weighton took place on the 18th inst. The schools, which are to accommodate about 100 children, are being built on a site on the south side of the town, at the junction of the Sanction and Cliffe roads. The main room is 60 ft. by 20 ft., with class-rooms and cloak-room. The architects are Messrs. Sinnott, Sinnott, & Powell, of Liverpool and Manchester. The contractor is Mr. Hudson, Market Weighton.

**WORMIT SCHOOL, DUNDEE.**—Additions are to be made to this school. These consist of three classrooms, each seated for seventy-two pupils. The plans have been prepared by Mr. T. Martin Cappon, architect, Dundee.

**PROPOSED TECHNICAL SCHOOL, LEEK.**—An inquiry was held at the Leek Town Hall, recently, before Colonel A. J. Hepper, of the Local Government Board, with reference to the application of the Urban District Council for sanction to borrow 4,000*l.* for the provision of a technical school and public gymnasium, and 350*l.* for the purchase of land for town-hall purposes. Mr. Sugden, the architect, stated that the builder's contract was 4,613*l.*, and his (Mr. Sugden's) estimate 4,300*l.*, but that did not include glazed bricks, which would make a difference of 200*l.*

**RHYL COUNTY SCHOOL.**—At a meeting of the governors of the Rhyll County School on the 20th inst., the chairman produced plans prepared by Mr. Shaylor, of Welshpool, of proposed new school premises. The plans showed accommodation for eighty boys and eighty-six girls. It was resolved to engage Mr. Shaylor's services as architect.

**SCHOOL-ROOMS, WREXHAM.**—On the 21st inst., Lady Osborne Morgan laid one of the foundation stones of a new school-room in connexion with the Bradley-road Baptist Mission Chapel, Wrexham. The school-room will cost 800*l.*, and the builders are Messrs. Davies Brothers, Wrexham, while the architect is Mr. John G. Owen, Liverpool.

**PROPOSED NEW WORKHOUSE INFIRMARY FOR SKIPTON.**—At a meeting of the Skipton Board of Guardians on the 15th inst., Mr. J. Hartley, architect, presented the plans of the proposed new workhouse infirmary, which is to contain forty-eight beds, the entire cost being estimated at 3,300*l.* The Guardians approved of the plans, which will be sent to the Local Government Board for approval.

**PUBLIC CONVENIENCE, SOUTH SHIELDS.**—A large underground convenience is to be constructed in the Market Place, South Shields. The sanitary and plumbing fittings will be carried out by Messrs. Shanks & Co.

**COAL WHARF, BERNONDSSEY.**—The Seaborne Coal Wharf, Bernondssey, is to be rebuilt from the designs and under the superintendence of Mr. Henry Adams as engineer. Messrs. Holliday & Greenwood, of Brixton, are the contractors.

**BUSINESS PREMISES, LYNN.**—New premises have been erected in High-street, Lynn, for Messrs. Jermyn & Perry and Messrs. Jermyn & Sons. The architect was Mr. H. J. Green, of Norwich and Lynn, the builders being Messrs. Kerridge & Shaw, of Cambridge.

**THE CRY ARCADES, BIRMINGHAM.**—With regard to the first section of the new arcades between Union-street and New-street, Birmingham, the builders' contract has been let to Mr. E. J. Charles, of Moseley; and the terra-cotta to Messrs. Doulton & Co., of Lambeth. The architects are Messrs. T. W. F. Newton & Chealte, of Birmingham.

**CLUBHOUSE, PLYMOUTH.**—A new clubhouse has been erected for Plymouth Corinthian Yacht Club, below the Citadel, and immediately opposite the end of Batten Breakwater. Messrs. A. R. Lethbridge & Son were the builders, and the architect was Mr. E. Coath Adams.

**IMPROVEMENTS ON THE COLMORE ESTATE, BIRMINGHAM.**—Perhaps no portion of Birmingham is at the present time undergoing so rapid a transition as the Colmore estate, between Colmore-row and St. Paul's-square. Old properties are being pulled down, streets are being widened and diverted, and a large number of modern buildings are rapidly springing up and taking the place of so many old rookeries. One of the most important buildings of this series is a large block of offices in Newhall-street, and also having a frontage to Cornwall-street (originally Bread-street). In this case, advantage has been taken in the difference of the levels to obtain several entrances. The building has been planned with suites of rooms for doctors or dentists, having separate entrances, and at the back and on the upper floors are a large number of professional offices. In the aggregate the number of rooms is about ninety. The elevations are in small red bricks and buff terra-cotta, and the roof is of Stow-in-the-Wold stone slabs. In Edmund-street, a block of offices for Messrs. G. J. Evson, Limited, built of red bricks and terra-cotta, has just been completed. Almost immediately opposite, new premises have just been started for Messrs. Edmund Vorrall & Co., bookbinders. These premises contain shop, ware-houses, and offices fronting the street, and will be carried out in Darley Dale stone, Leicester sand bricks, and Westmoreland slate roofs. Immediately adjoining will be two sets of doctors' chambers, with residential houses. They are so planned that they may be used, if necessary, as private hospitals. The elevations show four arches on the ground floor, in Portland stone, from which rise an equal number of ornamental bay windows, terminating in two high-pitched gables and a green slate roof. Perhaps a broader treatment than any of these obtains in the new buildings for Messrs. Buckler & Webb, Limited, at the corner of Church-street and Cornwall-street. The elevation to Church-street is divided into five large spaces, with semicircular arches, springing from wide and deeply-recessed piers. Above this is a boldly-modelled cornice and window in arcading for the top floor. This treatment is also in small red bricks and buff terra-cotta. The architects are Messrs. T. W. F. Newton & Chealte.—*Birmingham Post.*

**PUBLIC BATHS, BURSLEM, STAFFORDSHIRE.**—Colonel Hepper, of the Local Government Board, recently held an inquiry at Burslem into an application of the Burslem Town Council for sanction to borrow 1,680*l.* for the purposes of public baths, 900*l.* for public works and pleasure grounds, 760*l.* for street improvements, and 616*l.* for works of sewage. The various loans were explained in detail by the Town Clerk and Mr. F. Bettany (the Borough Surveyor).

**PUBLIC BATHS, CHESTER.**—On the 19th inst., at a meeting of the Chester Town Council, Alderman W. H. Churton moved the adoption of a recommendation by the Boating and Baths Committee that the plans of Messrs. Douglas & Minshall for the erection of public baths in Union-street, at an estimated cost of 11,000*l.*, be approved, and that the Committee be authorised to receive tenders and have baths erected. He explained that the plans provided for a swimming-bath 60 ft. long by 30 ft., a second swimming-bath 80 ft. long by 30 ft., with slipper baths, vapour baths, &c. In connexion with the scheme a new road will be made from Foregate-street to the site of the baths, near Grosvenor Park. The recommendation was agreed to.

**NEW BANK AT SHAW, NEAR OLDHAM.**—The new banking premises just opened in Shaw by the Oldham Joint Stock Banking Company, branch of the London and Midland Bank, Limited, are situated in Rochdale-road and Chapel-street. The whole of the work has been designed and superintended by Mr. Thomas Taylor, architect, Oldham.

**NEW BOARD-ROOM FOR DUNDEE CHAMBER OF COMMERCE.**—An addition to the accommodation at the Dundee Royal Exchange has been furnished in the construction of a board-room. To the new board-room, which is part of the building of the Pearl Life Assurance Company, entry is obtained by a doorway opening into the main staircase of the Exchange. The new room measures 25 ft. by 14 ft., with a lofty ceiling. The upper portions of the windows are filled in with stained glass, the wood-work being of oak. The offices of the Pearl Assurance Company are approaching completion. The architects for the work are Messrs. C. & L. Over, Dundee, and the various tradesmen are:—Mason work, Messrs. D. & A. Powrie; joiner, John F. Shaw; slater, James Alexander; plasterer, Renoch & Kilgour; and plumbers, John Farquharson & Sons.

**REOPENING OF THE COUNCIL CHAMBER, CHESTER TOWN HALL.**—On the 12th inst. the opening took place of the council chamber and other portions of the northern building of the Town Hall, Chester, which were destroyed or affected by fire on the evening of March 27, last year. Messrs. Lockwood & Sons, architects, Chester, were entrusted with the plans for the restoration of the council chamber, &c., and advantage was taken of



the occasion to effect other alterations in the interior of the hall. A contract for the work was entered into by Mr. W. Freeman, builder, Chester, for 7,970*l.*, but additional work and alterations will entail about another 1,000*l.* expenditure. A roof-light has been placed in the police-court, the magistrates' room has been considerably enlarged, a more commodious law library has been provided on the left side of the police-court corridor, whilst the old library-room on the opposite side of the corridor has been converted into a muniment strong apartment. Special attention has been devoted to improved sanitation and lighting and to the provision of a new heating apparatus throughout the hall.

**PARISH HALL, GATESHEAD.**—The new parish hall connected with the Ven. Bede Church, Sunderland-road, Gateshead, for Sunday school and other purposes, was opened on the 19th inst. The building is 76 ft. long, 36 ft. broad, and will seat 500. The cost is 1,500*l.* The architects are Messrs. Oliver & Leeson, of Newcastle; and the contractor Mr. G. H. Mauchien.

**FREE LIBRARY, ST. GEORGE'S, BRISTOL.**—St. George's Free Library was opened on the 19th inst. by the Bishop of Bristol. The building is Late Renaissance in style, and is constructed of red pressed bricks, with Ham Hill stone dressings and windows (filled with cathedral glass). The central door—of oak—opens into a large hall, at right angles to which are extensions forward to be used as reading and news-rooms; and portions are also set apart for ladies, students, and juveniles. The interior has a vaulted ceiling; the walls are stuccoed, and the dado is of opalite. There is an arched on the park side of the central hall, the arches being of Ham Hill stone, supported by columns of polished Aberdeen granite. From this opens a recess, in which the book-shelves are arranged. Inside the main entrance is a screen of wood and glass (with doors in front and on either side), dividing the building into several departments. Behind the recess, on the city side, are the librarian's room and other offices, and above the recess is an apartment for storage and general purposes. In the basement are a heating chamber and store-rooms. Mr. Frank Willis is the architect, and Messrs. W. Cowlin & Sons the builders. The cost of the structure has been between 6,000*l.* and 7,000*l.*

**PARISH ROOM, ST. HELENS.**—On the 20th inst. Sir David Gamble, Bart., officiated at the opening of a new parish-room and caretaker's cottage adjoining St. Mark's Parish Church, St. Helens. The buildings, which have cost 1,600*l.*, are of red brick with stone dressings, and comprise an assembly room, 40 ft. by 30 ft., with wood-block floor, and a dado of glazed brick 4 ft. 6 in. high. The main entrance is from North-road, at the south-west corner of the assembly-room, another door being situated at the east end, to the right of the platform, and leading into the vestibule. The architect of the building was Mr. James Gandy, and the contractor Mr. Peter Tickle.

**SANDEMAN PUBLIC LIBRARY, PERTH.**—The new Sandeman Public Library, Perth, was opened on Saturday last week by the Earl of Rosebery. The building occupies a central position in the city, and is Italian Renaissance in style, built of red freestone, and having four polished granite pillars in the centre of the front elevation in Kinnoull-street. The site is an oblong one, with a north and an east frontage, extending from Mid-street on the north along Kinnoull-street—a new thoroughfare—half way to the High-street. The main door is in Kinnoull-street about the centre of the building, and on its entablature is a carved shield with the city arms in relief, and immediately over this, in front of the fan-light, is a wrought-iron grille with the Sandeman arms in bronze. The door opens into a vestibule, the walls of which are treated with a facing of marble, while the floor and steps are of white Sicilian marble. From the entrance hall access is gained to the lending department on the left at the south end of the building, the librarian's room opposite the entrance, the main staircase, and the general reading and juvenile rooms to the right. The ground-floor, on which the foregoing apartments are situated, is 4 ft. above the street level. The entrance hall, and the space for the public in the lending room, are floored with cream mosaic. The other floors are laid with red pine in narrow boards. The lending library is 53 ft. by 35 ft., giving accommodation for about 25,000 volumes. The space for the public, with the service counters and indicators, is in the centre of the room, on the north side; and the book-shelves, of Kauri pine, are arranged round the walls. The general reading and juvenile rooms are the next section of importance on the ground floor. The former, which is 57 ft. long by 35 ft. wide, has light on three sides. The juvenile room, 21 ft. by 20 ft., is between the reading-room and the entrance-hall, and is accessible from both. Ascending a spacious staircase, the first floor is reached, on which is placed the reference department, book store, ladies' room, committee-room, &c., and the ground floor door to the librarian's house on the same level. The reference-room, 37 ft. by 35 ft., to the north of the building, is lighted from the roof on all sides. The ceiling is coved and panelled in plaster-work. The lower walls are panelled in yellow pine, and the

upper walls are divided by panelled plasters, with enriched capitals, carrying the main beams of the roof. Adjoining the reference-room on the west is the ladies'-room, 30 ft. by 18 ft., with a private lavatory, &c. These two rooms give accommodation for eighty-eight readers. To the right of the staircase is the committee-room, which is 22 ft. by 17 ft. A private door leads to the librarian's house, but the main entrance is from a staircase at the south end of the building. On an upper floor, over the south section of the building, is the picture gallery and museum, 53 ft. by 35 ft. The room is roof lighted, and the ceiling is coved and panelled similar to the reference library, and has an average height of about 20 ft. The gallery is approached from the main stair of the library, and has an emergency exit to the south staircase, which leads direct to the street. The basement floor is 4 ft. below the street level, and contains receiving-room, workshop, rooms for male and female attendants, newspaper store, heating chamber, &c., and also a public lavatory. The lavatory, &c., is finished with cream and buff-coloured glazed tiles, and the floor is laid with red and black Ruabon tiles. The whole building has been constructed with concrete floors and steel roof couples; and fire hydrants are placed on each landing. The heating is by means of cast-iron hot-water pipes and radiators. The vitiated air is extracted at the four corners of the principal rooms on the ground floor by fireclay flues built in the walls, leading to shafts on the roof, on which are placed exhaust ventilators. The upper rooms are ventilated at the centre of the coved ceiling. At the north-east corner is a turret, with saucer-shaped base, and other floors to the roof. Above the roof the stair terminates in a stone-roofed clock tower. The following were the contractors:—Builders, Messrs. Fraser & Morton, Perth; carpenter and joiner, Mr. T. D. Falconer, Perth; plumber, gas-fittings, and heating, Messrs. W. Frew & Sons, Perth; slaters, Mr. James Buchanan, Perth; Mr. A. McFichie, Dundee; steel beams, Messrs. Bladen & Co., Glasgow; glaziers and painters, Messrs. Stalker & Boyd, Perth; tile work and mosaic floors, Messrs. Galbraith & Winton, Glasgow; electric wiring, Messrs. Westwood & Sons, Perth; smithwork, Mr. D. McGregor, Perth; ironmongery and grates, Messrs. Garvie & Syme, Perth; and stone carving and marble work, Mr. J. L. Thomson. The Sandeman memorial tablet and the wrought-iron railing for the stair were supplied by Messrs. Jones & Willis, Birmingham. The total cost of the building, including furnishing, has been about 14,000*l.* Mr. P. Campbell, Perth, was the measurer; and the architects were Messrs. Campbell, Douglas & Morrison, Glasgow; Mr. Henderson was clerk of works.

**PUBLIC HALLS, NEILSTON, RENFREW.**—The new halls, which are now being erected, are situated in the main street of the village, and are designed in the Scottish Renaissance style. On the ground floor, at one side is an egress door from the main hall and a two-light window lighting one of the rooms, and on the other side a three-light window. On the upper floor, above a moulded sill course, are two broad four-light and one three-light windows. In lighting the lesser hall, the central window carried higher into the pediment. On the roof-ridge is a circular ornamental ventilating turret, with flat-domed copper roof. The front is being built of fine red stone from Gatawbridge quarry, and the roofs are covered with light sea-green slates, finished with red ridge tiles. Entering by the central door, there are on either side of the vestibule committee and ladies' rooms, and in an inner vestibule are the two doors to the large hall, and a staircase leading to the gallery and lesser hall. The main hall has coved and panelled ceiling, and half-oak timber floor. At one end is a small gallery, carried on a steel girder, and an open platform at the other end. The hall is seated for about 450 persons, with 72 in the end gallery. At the platform end are retiring-rooms for lady and gentlemen artists, and an additional exit door. The lesser hall occupies the upper floor of the front block, and accommodates 200 persons, and has also a separate retiring-room. The architect is Mr. John B. Wilson, Glasgow, and the buildings are being erected under his superintendence by the following contractors: Mason, Mr. Hugh Houston; Wrights, Messrs. Bell & Duguid; slater, Mr. Wm. Patrick; plasterer, Mr. Wm. Graydon; plumbers, Lochrie & Neilson—all of Barrhead; and glaziers, Messrs. Meikle & Sons, Glasgow.

**SANATORIUM, HUDDERSFIELD.**—The sanatorium for the accommodation of patients suffering from infectious diseases, erected by the Huddersfield Corporation at Mill Hill, Dalton, was opened on the 22nd inst. The building has been erected in accordance with the plans of Messrs. E. Thomas & Sons, London, whose designs were selected in competition. Situated about two miles from the centre of Huddersfield, the sanatorium stands very near the border, but within the borough. The administrative block, which has a frontage to the north-west, is in the Elizabethan style. From the entrance is gained to a central hall, on each side of which is a corridor, one leading to the rooms of the staff. On the first floor are nineteen bedrooms for the nurses. The second floor provides nineteen similar rooms for the servants. The rooms are divided by corridors, at the end of which are the

lavatories and baths. From the administrative block a covered way leads to the three pavilions for the patients. One pavilion is for acute cases of scarlet fever. Thirty beds are provided in five wards in this block, and a pavilion built on the same plan is for scarlet fever convalescent patients, and the third pavilion, having similar arrangements, is for typhoid patients. The floors are laid with teak. At the rear of the third pavilion are the laundry and mortuary. The buildings will be heated by hot water and fireplaces, and will be lighted by electricity, but gas is also laid on. The principal works have been carried out by the following firms:—Masons' work, Messrs. A. Graham & Sons, Huddersfield, and Mr. A. Schofield, Dalton; joiners' work, Mr. W. H. Pick, Bradford; smiths' work, Messrs. J. Bagshaw & Sons, Batley; slaters' work, Messrs. T. Longbottom & Sons; plasterers' work, Mr. W. E. Jowett; plumbers' work, Mr. J. Marsden, gasfittings, Messrs. L. Taylor & Co.; glaziers' work, Messrs. Crossley & Bould; painters' work, Mr. A. Jackson; engineers' work, Messrs. Calvert & Co.

**THEATRE, SALFORD.**—On the 22nd inst., Mr. George R. Sims laid the corner stone of the new frontage of the Regent Theatre and Assembly Rooms, Salford. The improvements, which were carried out at a cost of 12,000*l.* The theatre was built four years ago, and the premises are now to be completed by the erection of an ornamental front and an assembly-room. Mr. Frank Matcham is the architect, and Mr. W. Brown is the builder.

**PAROCHIAL HALL, ANFIELD, LANCASHIRE.**—The foundation-stone was laid on the 20th inst. of a new parochial hall and Sunday school in connexion with St. Simon and St. Jude's Church, Anfield. The erection, which is situated at the rear of the church, will consist of a school-room 83 ft. by 30 ft., a parish room 30 ft. by 20 ft., and two class-rooms. The whole of the exterior is to be carried out in grey brick with buff brick and red sandstone dressings, in keeping with the church building. The cost of the erection will be 1,650*l.*, the whole being carried out from the designs and under the superintendence of Messrs. R. Owens & Son, architects, Liverpool; while the contractors are Messrs. J. & G. Chappell, Walton.

**CITY HALL, BELFAST.**—The foundation-stone of this building, an illustration and a brief description of which appeared in our issue for June 12, 1897, was laid on the 18th inst. The buildings are in quadrangular form, the external dimensions being 300 ft. in length and 250 ft. in depth, the internal quadrangle being 130 ft. by 130 ft. A large portion of the site remains outside the City Hall. In the internal arrangements accommodation has been provided for the city officials and the following departments:—Town Clerk, City Surveyor, Health Department, Accountant, City Cashier, Gas Department, Electric Light Department, Rate Office, School Attendance Department, Market Department, Weights and Measures Department, &c. The reception-rooms embrace, first, an apartment, measuring 50 ft. by 30 ft., which will be specially set apart for receptions; next, the council-chamber, the dimensions of which are 70 ft. by 38 ft., together with the following:—Ante-room, robing-room, waiting-room, banquet-hall (70 ft. by 38 ft.), and three apartments for the Lord Mayor exclusively—viz., his reception-room, parlour, and retiring-room. The building is being erected by Messrs. H. & J. Martin, Limited, Belfast. Messrs. Thomas & Son, of London, are the architects.

**PALACE THEATRE, ABERDEEN.**—The new Palace Theatre, Bridge-place, Aberdeen (which will take the place of the People's Palace, destroyed by fire), was opened on Monday. There is accommodation for 3,000, and the total cost has been about 15,000*l.* It is a granite building, and is fireproof throughout. The architect is Mr. John Rust. The following were the contractors:—Mason, George Hall; carpenter, George Jamieson; plumber, John Campbell; plasterer, George Gibb; slaters, McGregor & Shand; ironwork, painters and glaziers, G. Donald & Sons; ironwork, Jas. Abernethy & Co.; heating, Shirras, Laing & Co.; electric lighting, P. C. Middleton & Co.; all of Aberdeen; upholstery, furnishing, and decorative work, A. R. Dean & Co., Birmingham; stage scenery, Kelly, Wilkins, & Co., Liverpool. The clerks of works were—first, Mr. Alex. Cruickshank, and subsequently Mr. John McWilliam.

**NEW BUILDINGS, BURTON-ON-TRENT.**—The Burton-on-Trent Co-operative Society, Limited, are about to build a range of stables, caretaker's houses, and boundary walls at Shobnall-street on land recently purchased by them from the L.N.W.R. Company. Mr. W. A. Stevenson, has secured the contract for 2,355*l.*, and Mr. R. Stevenson, Burton-on-Trent, is the architect. Plans are also in course of preparation for a range of offices, store-rooms, and concert hall, to be erected in Byrkley-street.

**ST. CUTHBERT'S PARISH HALL, DURHAM.**—On the 25th inst. the foundation-stone of St. Cuthbert's new Parish Hall, Durham, was laid by Mrs. Darwin of Dryburn. The site is at Framwellgate Head, at the junction of Framwellgate and Sidegate. The hall will be used in the dual capacity of mission hall and Sunday schools, also for social gatherings. It will be 25 ft. broad and 52 ft. long. The architects are Messrs. Plummer & Burrell, of Newcastle and Durham; and the contractor is Mr. C. W.



Gibson, of Durham. The entire cost will be about 700*l*.

**PROPOSED NEW LAW COURTS, LEEDS.**—We are glad to hear that the Leeds Corporation are turning attention to the need for new and more commodious Law Courts, and that it is probable they will face towards Victoria-square and take the place of the mean buildings which now face the front of the Town Hall. Some such improvement is what we have several times recommended.

**THE ROYAL EAR HOSPITAL, SOHO.**—We are informed that the Building Committee have approved Mr. A. O. Collard's plans and designs for new buildings to be erected, at an estimated cost of 2,000*l*, on a site in Dean-street, recently bought for 2,000*l*. This hospital, the oldest of its kind in Europe, was founded, under Royal patronage, as the "Royal Dispensary for Diseases of the Ear," in 1816, in Dean-street, whence, in 1876, it migrated to a house, its present quarters, in Frith-street, where, seven years later, an in-patient department with a children's ward, were opened. In view of increasing requirements and the scanty accommodation afforded by the existing house, an effort is being made to provide more suitable premises, towards which subscriptions are much needed.

**ST. CUTHBERT'S CHURCH, GLASGOW.**—This church, which is situated at the corner of Hinshaw-street and Doncaster-street, near New City-road, has been opened, in the entrance is in Doncaster-street. The gable of the church has the lancet lights, divided by played buttresses, and a wheel window in the apex of the gable, the gable being flanked by buttresses, terminated with moulded gables. There is a spacious entrance hall and staircase, the floor being laid with Corshill pavement. The entrance to the church is from the east of the church. The elevation to Hinshaw-street is divided into four bays. The total accommodation in area and gallery is 840. The pulpit and choir are approached by stone steps, and the floor is laid with encaustic tile. The hall is parallel with the church, and is lighted from the roof, and has accommodation for 300. The church and hall are heated by hot-water pipes, low-pressure system. The masonry is of Montgrennan stone, the roofs being covered with red Staffordshire tiles. The total cost, including price of site and cost of extra foundations, is 8,000*l*. The tradesmen were: mason and wright work, Messrs. W. Shaw & Son; A. & D. Mackay, for slater work; Mitchell & Davis, for plaster work; Colin Turner, for plumber work; & J. Malloch, for glass work; and J. Singer & Son, Frome, Somersetshire, for gas-fittings. Mr. W. F. McGibbon was the architect.

## SANITARY AND ENGINEERING NEWS.

**WATER SUPPLY, HARRGATE.**—Alderman Fortune (Chairman of the Water Committee) on the 17th inst. set the first seal in connection with the Scargill reservoir. The engineer is Mr. Dixon.

**THE WALLASEY WATER SCHEME.**—A special meeting of the Wallasey Urban District Council in committee was held on the 17th inst. at the public offices, Egremont, to consider the proposed new water scheme for the district, by which it is suggested to secure a supply of water from Flintshire. Mr. Deacon, the engineer appointed to prepare the plan, stated that the cost was more likely to be over than under the estimated cost of 465,000*l*. The majority of members present were of opinion that sufficient time had not been taken to consider the subject, and the matter was referred back to the committee for further consideration.

**POLLUTION OF THE MERSEY.**—At the meeting of the Manchester Rivers Committee on the 17th inst., he question was raised of the proposed attempt on the part of the Liverpool Corporation to prevent the Manchester Corporation from discharging the contents of the sludge steamer at the entrance to the Mersey. The Rivers Committee of the Corporation expressed considerable surprise at the proposed proposal, especially in view of the fact that they only deposit sludge far out at sea, beyond a point where it can affect the city of Liverpool, whereas the Liverpool Corporation not only pour their crude sewage into the Mersey close to the Landing-stage, but also discharge all the solid refuse of the city at the same point at which the sludge is deposited from the Manchester steamer. The Chairman and Deputy-Chairman were instructed by the committee to safeguard the city of Manchester in this matter, and necessary to take joint action with the Sanitary Canal authorities. A letter was read from the Local Government Board granting authority for the borrowing of 110,570*l*. for the purpose of sewage and sewage disposal. This is a part of 170,000*l*. spent by the old Rivers Committee, and for which borrowing powers had not previously been obtained.

**STREET IMPROVEMENTS, BLACKPOOL.**—A Local Government Board inquiry was held at the Blackpool Town Hall recently by Colonel W. Langens, M.P., M.Inst.C.E. The application made by the Corporation was for sanction to borrow 3,647*l*. for works of private street improvements and 1,003*l*. for public purposes. The Borough Surveyor, Mr. J. Olsenholme, explained the necessary works.

**LEEDS AND ITS SEWAGE SYSTEM.**—A report was presented to the Streets and Sewerage Committee its meeting on the 19th inst. with reference to

the result of the experiment with the Dibdin system at Knostrop, which was recently adopted by the Council. The treatment of the sewage had, it was stated, given every indication of the possible solution of the difficulty of dealing with so large an accumulation of sewage per day.

**CASHPHILLY SEWERAGE SCHEME.**—The Local Government Board have sanctioned the scheme promoted by the Casphilly Urban Council for draining Casphilly, Llanbradach, Aber, and Sghendd, and sewage disposal, in respect of which it was proposed to borrow 36,000*l*. The district proposed to be drained by this scheme is about 17,000 acres. The scheme is in two sections, viz. Rhymney Valley and the Aber Valley. The engineer is Mr. Harpur.

**SEWAGE WORKS, HORNSEY.**—On the 20th inst. Mr. Robert H. Bicknell, one of the Local Government Board Inspectors, held an inquiry into an application from the Hornsey District Council to borrow 1,876*l*. for works of sewage and surface-water drainage, 1,464*l*. for street improvements, and 580*l*. for works of paving. Mr. Lovegrove, the Surveyor, explained the nature of the proposed works.

**"GENESIS OF STREET MUD."**—At the close of the meeting of the Public Works Committee of the Cardiff Corporation on the 20th inst. Mr. Harpur, the Borough Engineer, asked permission to call the attention of the committee to the articles which had recently appeared in a contemporary under the heading, "The Genesis of Street Mud," and particularly to point out discrepancies in reports purporting to come from Professor Elliott. The Mayor said that nothing that had been said in the slightest degree shaken the confidence of the members in the advice given to the Corporation by the Borough Engineer.

**ABERDEEN WATER SUPPLY.**—The Water Committee of Aberdeen Town Council have requested Mr. G. Gordon Jenkins, of Messrs. Jenkins & Marr, C.E. and architects, Aberdeen, to assist Mr. W. Dyack, Borough Surveyor, in making a survey and reporting on the cost of obtaining a water supply for the city from the River Avon at Inchroay, and as to the route.

**ABERDEEN SEWERAGE SCHEME.**—The report by Mr. Mansergh, engineer, London, who was consulted on this subject, has been presented. It deals with the complete sewerage system of the city—the whole scheme to cost 187,105*l*, and the works to be begun at once, 112,495*l*. The expense of the scheme proposed by Mr. W. Dyack, Borough Surveyor, was 164,490*l*. The Town Council's Sewerage Committee, having considered the subject, resolved to apply to Parliament for the necessary powers to carry out the following works:—High-level sewers, 11,000*l*; Girdleness outfall, 47,750*l*; low-level sewers, 7,670*l*; Ferryhill storm-water culvert, 8,000*l*; Tile Burn storm-water culvert, 5,500*l*; other storm-water overflows, 1,025*l*; connecting sewers at Hutcheon-street, Millburn-street, and Torry, 8,100*l*; Don Valley outfall, 10,500*l*—total, 99,745*l*. This motion was carried by six votes to one against an amendment to carry out Mr. Mansergh's scheme in full.

## FOREIGN.

**FRANCE.**—In spite of the unfavourable report of the Commission de Voirie, the Municipal Council of Paris voted last Saturday for the purchase of the land necessary to keep an open space before the Cluny Museum and for the new Sorbonne. The price was 1,200,000 fr., of which half will be paid by the State; and the Municipality will undertake the formation of a new square on the site. Considerable interest has been excited by the exhibition, at the Georges Petit Gallery, of the works of an American painter, Mr. George Innes. A new infirmary for the aged is shortly to be built at Dieppe. At the Académie des Beaux-Arts the question of the successor to M. Lenoire is already being considered; the names most spoken of are those of MM. Hargnigues, Roybet, Henri Martin, Rochegrosse, and Carrière. A fine marble bust of Alexandre Dumas, by M. Moncel, has just been placed in the vestibule of the library of the Institute. The jury of the Ecole des Beaux-Arts announced to adjudicate on the competition in the First Class of Architecture has awarded a *Première Médaille* to M. Auguste Perret, pupil of MM. Uadet, and Raulin. The subject was "A Country House." The *Société Industrielle* of Orleans has opened a competition for the construction of artisans' dwellings in that city. The death is announced, at the age of 101, of M. Frédéric Moreau, who had acquired an archeological reputation for the excavations which he had carried on in the Department of l'Aisne, as well as by a collection which was well known both to French and foreign antiquaries. The death is also announced at the age of sixty-eight, of M. Alphonse Goutte, former city architect of Montpellier. He was a pupil of Questel, and was Professor at the Arts School at Montpellier, and Member of the *Société Centrale des Architectes*.

**BURNS STATUE, LEITH.**—The Burns statue for Leith has been erected at the junction of Bernard-street and Constitution-street. The artist was Mr. D. W. Stevenson R.S.A. Edinburgh.

## MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—In consequence of their present offices at 17, Great George-street being required by the Government, Messrs. Howe & Eversfield (auctioneers) have temporarily removed to No. 19, Great George-street.

**GLASGOW BUILDING REGULATIONS.**—The Corporation Building Regulations Committee met on the 19th inst., and received reports from the various departments on the question of improved by-laws for building regulation in Glasgow. It was agreed to make a synopsis of these reports, and hold another meeting to consider whether it will be possible in a Bill this Session to deal with all the points raised.

**ST. MICHAEL, BASSISHAW, CHURCH.**—In pursuance of a scheme made under the provisions of the Union of Benefices Acts, the living of St. Michael, in Bassinghall-street, has been united to that of St. Lawrence Jewry. The church of the latter parish has served, since its re-building by Wren, for the united parishes of St. Lawrence Jewry and St. Mary Magdalen, Milk-street; we understand that under the scheme the demolition of St. Michael's church will soon be proceeded with. It was erected (1676-9) by Wren, at a cost of 2,837*l*, on the site of the church re-built circa 1450, by John Burton and his wife Agnes, to replace the original one whereof the patronage in the twelfth century belonged to the prior and canons of St. Bartholomew, West Smithfield. In 1246 Henry III. gave the advowson to Adam Basing, son of Salomon Basing (Lord Mayor in 1216-17), a member of the family after whom the ward and the street are commonly considered to take their name. The church is plainly designed; the main body, measuring 70 ft. by 50 ft., is of brick; the tower is that of the former structure. The tower—latterly faced with cement—has stone window dressings and angle piers; it has four stories, the top stage has a cornice, and a blocked parapet with pine-apples at the angles; from within the parapet rises a leaden lantern, octagonal on plan, having buttresses in the upper stage, which carries a concave spirelet and vane. Corinthian columns divide the interior into three aisles, the cambered ceiling, shaped into panels, has side openings for light. The labours of Dr. Thomas Wharton during the Great Plague were commemorated by a finely sculptured tablet, erected after his death in 1673; in the church were buried John and Agnes Burton, and the following Lord Mayors—Sir James Yaford (elected 1519), in a chapel he built for himself on the choir's north side; Sir Richard Gresham (1537), and Sir John Gresham (1547), sons of John Gresham, of Holt, Co. Norfolk; Sir Wolstae Dixie (1585), son of Thomas Dixie, of Catworth, Hunts; and Sir Leonard Halliday (1605).

**ACCIDENT AT THE KENNINGTON THEATRE.**—On the 24th inst. an accident happened at the new Kennington theatre which is in course of erection at Kennington-park-road. During the day two joists, measuring 12 ft. by 6 ft., had been placed in position in the stage work, but had not been fixed. Shortly before six o'clock some men employed by Messrs. Cawdrey & Co. were engaged in carrying timber over the joists, when one of the beams snapped in the middle, causing them to fall a considerable distance to the floor below. A carpenter named M'Phee had his skull fractured, the other men escaping with slight injuries. M'Phee was conveyed to St. Thomas's Hospital, where he was detained, little hope being entertained of his recovery.

**QUEEN'S STATUE FOR DUNDEE.**—The red granite pedestal for the bronze statue of the Queen for Dundee, has been prepared by Messrs. Bower & Florence, Aberdeen, under the superintendence of Mr. Haden A. Bower, architect. The sculptor is Mr. Harry Bates, and the total cost of statue and pedestal will be about 2,500*l*. The figure is in a sitting posture, the left hand supporting the orb, and in the right there will be a spray of laurel.

**PUBLIC IMPROVEMENTS, EGREMONT.**—Mr. W. O. E. Meade-King, M.Inst.C.E., held an inquiry on the 14th inst. at the Public Offices, Egremont, regarding an application by the Wallasey Urban District Council for permission to borrow (1) 40,000*l*. for gas purposes, (2) 1,790*l*. for street improvements, and (3) 1,108*l*. for fire brigade purposes. There was no opposition, evidence in support of the applications being given by the following officials:—Messrs. J. J. Burnley (accountant), J. H. Crowther (engineer), and W. H. Travers (surveyor).

**A NEW LINING MATERIAL.**—The "North European Compo-Board Company" (Denmark) send us a description and specimen of their new material, "Compo-Board," for lining walls, ceilings and floors. It is made up in boards 3 in. thick, consisting of five layers viz.: two of damp-proof closely pressed paper board, one of a core of wood in sections, the grain running in different directions, the two other layers of a fireproof cementing material between the wood and the two paper layers. From the specimen sent to us, it certainly appears to be a very solid and strong material, and likely to be an efficient protector against cold and damp, though

\* Some hold that "Bassishaw" relates to the Bassetts; the Bassings are cited amongst the "Lombards" in the Hundred Rolls of Edward I.; their town house stood in Bassinghall-street.



we hardly fancy that it can be, as stated, "cheaper than plaster." Nothing is said as to the method of fixing it to the wall.

A BRICK CARRIER.—Messrs. Henry Fearncombe & Co. (Wolverhampton) send us an illustration of a useful and safe form of brick carrier, consisting of two iron frames at right angles with each other, one of them opening to admit eight bricks, and fastening with a hasp; a staple is fixed on the top to take a hook and chain for carrying the whole. It is simple and strong, and seems perfectly safe. It is called the "Phoenix Brick Carrier."

BRAIDED COTTON SASH LINE.—We have received a sample and description of the "Samson" solid braided cotton sash line (no maker's name attached). It is made with the strands doubling on each other and running through close to the centre, and claims to have greater resistance to wear than twisted, cable laid, or hollow braided line. We have had no opportunity of testing it in working, but it looks a very strong and compact cord.

EXPLOSION IN WELLINGTON-STREET, STRAND.—An explosion occurred in Wellington-street, Strand, on Wednesday, near the Bow-street end. It was found that an electric light box, which lies flush with the pavement, had been blown out, and the roadway for a distance of several feet ripped up. The iron cover of the box was hurled a considerable distance in the air.

SEPUICHRAL SLAB, RAND.—The Rev. J. D. Spain writes to us that the slab illustrated in our last issue was drawn by his son, Mr. J. E. Spain, whom we described as "Rector" in brackets. The letter we received with the drawing was apparently written by the Rector, and did not state clearly who the drawing was by.

### CAPITAL AND LABOUR.

BRISKNESS IN THE BUILDING TRADES.—The carpentry and joinery trades, both in the "house" and "ship" departments, are at present in a very flourishing condition. This satisfactory state of things is due to the exceptional activity in the general building industry and also in the shipyards. As illustrating the briskness just now prevailing, it may be mentioned that the Amalgamated Society of Carpenters and Joiners has only 371 out-of-work members out of a total of 55,600, representing a proportion of only two thirds per cent. whilst it may also be noted that the Colonies and foreign countries are responsible for one-third of the number on benefit. In the Manchester district there are less than one-half per cent. on donation. Trade in all the leading centres is reported as satisfactory. It may be added that the Society contributed 2,900l. to the miners and others in South Wales during the recent dispute.—*Liverpool Mercury.*

BARRY MASONS' LOCK-OUT.—A specially-summoned meeting of the members of the Barry branch of the Operative Stone Masons' Society was held on the 19th inst. for the purpose of considering the proposals of the Barry Master Builders' Association to terminate the lock-out now existing in the district. The Conciliation Committee had met on the 15th inst., when the masters agreed to withdraw the lock-out notices provided the men agreed to return to work, and that they would raise no objection to the non-Society men who were at present engaged. These proposals were considered on the 19th, but the masons unanimously refused to accede to the requirements of the masters.

### LEGAL.

#### INJURY TO BUILDINGS THROUGH EXCAVATIONS: APPLICATION BY THE CONTRACTORS.

THE case of Jordon v. the Sutton, Southcoates, and Drypool Gas Company and Holme & King came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Chitty and Vaughan Williams, on the 24th inst., on the application of the defendants, Messrs. Holme & King, the contractors, to abide the result of an appeal brought by the other defendants, the gas company, from a decision of Mr. Justice North in the Chancery Division on August 4 last; reported in the *Builder* of February 10 and August 13. It may be remembered that the plaintiff brought his action for damages against the gas company and for respect of injury caused to his cottages and land at Hull in consequence of subsidence caused by the withdrawal of water and sand in suspension from a running silt bed when the defendants began to excavate for the purpose of constructing a sunk gasholder tank, the plaintiff alleging that the contractors had been guilty of negligence in not adopting the best known methods of damming back the water and silt during the operation of constructing the tank. The plaintiff also complained that the gasholder, when erected and inflated to the proposed height of over 100 ft., would interfere with the access of light to his cottages, and on this issue Mr. Justice North found for the plaintiff, and granted an injunction restraining the gas

company from raising the gasholder on its north side to a height of more than 68 ft. from the ground. He further awarded the plaintiff 340l. damages as against all the defendants for the injury which had been done.

Mr. Eardswell now said he appeared for Messrs. Holme & King, and his application was that the appeal which had been entered should be adjudged as brought by the defendant gas company, and that his client's appeal should be allowed to stand postponed until their lordships gave judgment in that appeal. The appeal of the gas company covered the appeal of Messrs. Holme & King, and that if the gas company won on their appeal his clients would lose. Therefore, to save time and expense, his clients were desirous not to go on with their appeal until the other appeal was heard. He (counsel) consented to abide by their lordships' judgment in the first appeal, and not to offer one single argument.

Mr. B. Pollock, on behalf of the respondents, said he did not object if there was an understanding that there should not be two hearings.

Upon this undertaking of Messrs. Holme & King their lordships allowed the application.

#### CASES UNDER THE LONDON BUILDING ACT.

On the 25th inst. Mr. N. W. Hedges, of Orpington-road, Seven Sisters-road, was summoned by Mr. J. Goodchild, the District Surveyor of East Islington, for erecting a roof at his steam joinery works entirely composed of combustible material and without giving notice as required by the London Building Act. He had on a former occasion erected a similar roof and taken it down on notice being served on him, and now contended that it was only a timber stage. Mr. Horace Smith considered it very dangerous and imposed the full penalty of 40s. and 23s. costs.

On the same day Mr. W. Fuller, builder, of Avenell-road, Highbury, was summoned by the same Surveyor for rebuilding a bay without giving notice as required by the same act. The defendant had denied having done any work at the house in question until compelled to admit it, and Mr. Horace Smith imposed the full penalty of 40s. and 12s. 6d. costs.

Mr. Goodchild stated that he had only on a very few occasions asked for a penalty, but it was necessary to warn builders that even small works require notice, as sometimes when done without supervision they had to be redone in a year or two, and the magistrate remarked "Yes, and at great expense."

### MEETINGS.

FRIDAY, OCTOBER 28.

The Architectural Association.—Mr. J. E. Newberry on "Excavations at Thebes." Illustrated by Lantern Views. 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. F. J. Sykes on "Objects and Methods of Inspection, Nuisances, &c." 8 p.m.

SATURDAY, OCTOBER 29.

Sanitary Institute (Demonstrations for Sanitary Inspectors).—Inspection at Express Dairy Company's Farm, Colchester Farm, First-class Dairy, &c. London and Provincial Builders' Foremen's Association (Memorial Hall, E.C.).—Monthly Meeting. 7.30 p.m.

MONDAY, OCTOBER 31.

Sanitary Institute (Lectures for Sanitary Officers).—Professor W. H. Corfield on "Water Supply, Drinking Water, Pollution of Water." 8 p.m.

TUESDAY, NOVEMBER 1.

Institution of Civil Engineers.—Address by Mr. W. H. Preece, C.B., F.R.S., the President, and Presentation of Medals and Prizes awarded by the Council. Reception by the President in the Library after the meeting. 8 p.m. Northampton Institute, Clerkenwell.—Mr. F. Bond on "The Geometrical Period." 8 p.m.

WEDNESDAY, NOVEMBER 2.

Royal Archaeological Institute of Great Britain and Ireland.—(1) "Amber from various Places," by Professor T. McKenny Hughes, M.A., F.R.S., F.S.A.; (2) Paper by Mr. Edward Peacock, F.S.A. 4 p.m.

British Architectural Association.—The Rev. Cesar Caine on "Our Cities Sketched 500 Years Ago." 8 p.m. Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection at Disinfecting Station, Chelsea, 3 p.m.; (2) Lecture by Dr. A. Hill. 8 p.m.

Edinburgh Architectural Society.—Mr. J. A. Williamson on "Municipal Buildings." 8 p.m. Liverpool Engineering Society.—Address by the President-elect, Mr. J. A. Brodie. 8 p.m.

THURSDAY, NOVEMBER 3.

Carpenters' Hall, London Wall (Free Lectures on Building and Sanitary Construction).—Professor Banister Fletcher on "Sanitary Construction, Warming, and Ventilation." 11. 7.30 p.m.

FRIDAY, NOVEMBER 4.

Architectural Association Discussion Section.—Messrs. P. M. Elgood, A. R. Jemmett, and H. V. Lancheater, on "Modern Architectural Tendencies, as Illustrated by Contemporary Work." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Infectious Diseases and Methods of Disinfection." 8 p.m. Glasgow and West of Scotland Technical College (Architectural Craftsman's Society).—Mr. W. Vickers on "Decorative Stone Work." 8 p.m.

SATURDAY, NOVEMBER 5.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Southwark and Vauxhall Water Works, Hampton.

Union of British and Foreign Certified Carpenters.—Visit to the "Carlton Hotel." 3 p.m. Meeting at Carpenters' Hall. 6 p.m.

### RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until December 5.

15,697 19,632.—SCREWDRIVERS: M. Wyatt.—For the handle is substituted a loop to admit of a firm grip on a plain cross-handle; to the bar or shank is affixed a moveable sleeve with flange for a hand-grasp, and instead of the usual single sharpened edge, is affixed an appliance for holding bits and similar tools.

22,101.—LEVELLING STAVES: J. E. Bach.—Within the frame of the staff is a graduated tape tightly distended, between two pulleys at the top and bottom of the staff, and exposed to view on the staff's front; the tape can be moved throughout its entire length by teeth in the lower pulley which fit into punctures in the tape or in a chain attached thereto; in operation, the staff is held at a place whose altitude is known or assumed, the surveyor directs his levelling instrument upon it and signals to his assistant to raise or lower the tape until the altitude is read on the scale wheels with the assistance to clamp the tape.

22,734.—WINDOW SASHES OR FRAMES: J. Matthew & J. T. Buckley.—To dispense with cords, weights, or counterbalances of every kind are contrived two frames or sashes in a casing which has one guide or race arranged so that the sashes when in position may slide or run in line, and having an opening at its two upright and opposite sides to communicate with the cavity in the wall; in line with the bottom of the two sashes is provided, on each side of the casing, a trough, extending into the wall-cavity, for receiving the sashes which have runners or pulleys; the troughs are intended to collect water or moisture from within.

22,735.—CONVERTIBLE OPEN AND CLOSE FIRE-RANGES: C. Mill.—A hood or canopy for covering and uncovering the opening through which the fire gases pass is adapted to be opened and closed by the action upon the hood of a bent lever arm operated by the movement of the fire-crow.

24,069.—VENTILATING WATER-CLOSETS: W. Dalton.—A grooved rim is shaped so that, when fitted to the top of the basin, the overlapping groove shall allow a current of air to circulate freely and collect the fumes for conveyance away through an outlet-draught pipe attached to the grooved rim; for ingress of air to the rim its plates are perforated for pipes communicating directly through the closet walls with the atmosphere outside.

25,423.—EXTENSION LADDERS: S. T. Waggoner.—The sides of one ladder-section travel between the sides of the other section; on the sides are bolted a pair of brackets to receive the diminishing ends of a spigot having a pair of pawls rigidly mounted thereon, whose outer ends take under the rungs of and support the inner section; one knotted end of a rope passes through a screw-eye in the underside of the lowest rung of the outer section, and the rope is taken up to a sheave at the upper section's upper end and so through a second eye on the lowest rung of the outer section and thence to a third screw eye on the upper side of the rung which carries the first-named screw-eye; a pair of iron guiding-brackets are bolted to the inside surfaces of the sides of the section and adjacent to, but below, the brackets, whilst the cross-piece serves the double purpose of supporting the sheave and acting jointly with the adjacent rung, of localising the pawls and keeping them in position to engage the rung next above; at the same time they enable the rungs of the lower section to displace them sufficiently to allow that lower section to be raised.

25,802.—CONNECTING SANITARY PIPES: J. E. Place.—The improvement consists in forming in the socket end of each pipe, and in the lower part thereof a semicircular seating shaped so as to make a locking beam for the spigot end of the next pipe, which has a corresponding semicircular projection.

25,959.—COMBINED KITCHEN RANGE AND DESTROYER: J. B. Fetter.—The destroyer is made by enclosing the ashpit with a door and frame, or lid or cover, having closely-fitting joints, the door being hinged or otherwise attached so as to give ready access to the ashpit. The door or cover has inlet apertures for supplying air to the fire and for ventilating the ashpit.

26,108.—WASTE-WATER LATRINE CLOSETS: W. Oates.—The invention relates to that class of closets wherein the top of the pedestal has a flanged shoot or conical hopper set forth in letters patent 1896-1897. It consists in making the pedestal without a top flange, and the conical hopper with a double or compound flange fitting on the top of the flangeless pedestal. By forming the pedestal without the top flange the inventor claims to make them in an ordinary pipe-moulding machine, quickly and at a reduced cost.

26,262.—JOINTS IN EARTHENWARE AND OTHER PIPES: J. J. Green & C. L. Stiff.—On the spigot end of the pipe, near the end of the socket when the pipes are in position, is formed an annular fillet or rug of cement so as to nearly fill the space between the spigot and sockets between the fillet and the socket, the joint is made tight with liquid cement poured through a hole in the socket; the outer sides of the fillet and socket may be luted with clay, and in some cases the fillet or rug in the socket can be discarded.

19,825. 21,445.—RULERS OR SQUARES FOR GEOMETRICAL AND OTHER DRAWING ON BLACK-BOARDS: J. M. Labat, Guilmant.—The ruler, acting upon the principle of the ordinary T-square for the drawing of horizontal lines, adheres by means of a spring to the black-board, and a moveable hinged arm fitted thereto enables the operator to draw parallel lines at any angle without the aid of set squares or other contrivances; the ruler is made of two pieces of wood, whereof one (A) is fixed in the stock and plays freely through a block, on both, whilst the other (B) plays freely through the stock and can be fixed to the block by means of a screw; on pressing B through the



Alburn.—4 and 5, Kingsgate-pl., a profit	800
rental of 31/10s., u.t. 6 yrs., with reversion	
for 40 yrs.,	630

## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised	Fremiums.	Designs to be delivered.
*Fire Brigade Station .....	Bradford Corp. ....	10s. 50s. and 30s.	Jan. 2, 99
*Designs for Alterations to Workhouse	Highworth & Swindon Upton .....	Particulars of J. P. Kirby, 42, Crickle-road SWINDON	No date

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Alterations to Banking Premier, Bridlington Quay	York Union Banking Co. Ltd.	R. S. Jacobs, Archt. How laby lane, Hull	Nov 1
Underground Conduits	Riesdown U.D.C.	E. H. Hayes, C.E. Town Hall, Leeds	do
Free Library	Acton U.D.C.	Surveyor, 242, High-street	do
Drainage Works	Barnsley N.C. Co.	H. Crawshaw, Supt. L. Regent, Barnsley	do
Wesleyan Chapel, Abbeytown, Carlisle		C. C. Hewitt, 15, Ge. George street, Wigton	do
House, Uddoy, Aberdeen		J. Jenkins & Muir, C.E. 118, Bridges s. Aberdeen	do
Additions to Wesleyan Chapel, Knap Kerbing, & Powell-street	Truantes Heath Town U.D.C.	F. West, Archt. 17, Victoria- street, S.W.	do
Bank, &c. Station-road, Featherstone, near Pontefract		E. W. E. Berrington, Rogar Willesdonk	do
Sewage and Water Drainage	Leamham, Trow & Co. Bransley U.D.C.	Graves & Keyworth, Archt. Surveyor, Council Offices, Bransley, Kent	do
*Kerbing, Paving, Metalling, &c. Gabriel-street	Lewisham Board of Works	S. R. Town Hall, Catford, S.E	do
*Kerbing, Paving, Metalling, &c. Heron-street	do	do	do
*Wood Paving Blocks	Westminster Vestry	G. R. W. Wall, Westminster- Hall, Hill-st. C. Council Office	Nov. 2
Road Works, Millam Quay	Felling, Durham U.D.C.	H. Miller, C.E. Council Office	do
Twelve Houses, Harrogate		H. E. & A. Brown, Archt. Harrogate	do
Additions to Church, Alnwick		M. T. Wilson, Archt. Alnwick	do
*Repairs to Two Houses at Workhouse	Obenham Guardians	W. Miller, 250, King's-road, Crickle	do
*Making up and Paving	Fulham Vestry	C. B. Heston, 11, Town Hall W. Ham Green	do
Waterworks	Plymouth St. Mary E.D.C.	H. Francis, C.E. Devon port	Nov. 3
Granite Setts (3,700 tons)	Keighley Corp.	W. H. Hopkinson, C.E. Keighley	do
Sewering, North-nearc	Hirrald U.D.C.	W. Middlehouse, Hirrald- side	do
Pair Villas, St. John's-avenue, Brid- lington Quay		J. Burnshaw, Archt. Brid- lington Quay	do
Market-Extension &c. Wainman-street	Bradford Corp.	J. E. B. Smith, City Surv. Town Hall, Bradford	do
Stabling, &c. Dudley Hill	Bradford Prov. Ins. Sec. Ltd.	Robert Smith, Archt. 40, Manchester-road, Bradford	do
Block of Buildings, Belfast		G. G. Lindsay, Archt. 10 Queen's Road, Belfast	do
Schools, Lindley, Huddersfield		J. Kirk & Sons, Archt. 10 Queen's Road, Huddersfield	do
Hospital Additions, &c.	Widnes Corp.	F. W. Hyde, Archt. 24, Dale-street, Liverpool	Nov. 4
Football Pavilion, Beech Rowbery Bridge		H. Hutton, Archt. Town Hall, Glenford, Strathclyde	do
Street Works, Castleford	Whitwood U.D.C.	A. Bentley, Archt. 40, Glenford	do
Public Library, North-William-street	Dublin Corp.	C. C. Armit, City Surv. Hall, Cork Hill, Dublin	Nov. 5
Police Station	Macledland Corp.	E. E. Ashland, Town Hall Glasgow	do
Two Houses, Broom, N.B.	Hornsey U.D.C.	E. J. Leverage, Offices, South-gate, Hornsey	Nov. 7
*New Bath	do	do	do
*Supply and Fixing of Library Fittings	do	J. A. Angell, Council Offices, Queens-gate, York	do
*Paving Works	Beckenham U.D.C.	W. G. W. Washington Institute, Hainworth	do
*Mann and Iron and Steel Work at Lodge, Edinburgh	Caledonian Ry. Co.	Brown, S. A. Sneyland, Edinburgh	do
*Town Hall and Offices	Eltham U.D.C.	E. E. Manton Buckingham W.C.	Nov. 8
Road Works, Milton-road	Margate T.C.	Aspley, C.E. Municipal Buildings Margate	do
Hotel, Windermere	Nirak's Trustees	G. W. Mills, Addington Station, W.	do
Cottages, Rinderhoe	W. Rylands Co.	Public Office, Dynevor, Kilmarnock, N.W.	do
*Road Making and Sewer Works	do	do	do
*Road Making and Paving	Hackney Vestry	J. Lovegrove, Town Hall, Hackney, N.E.	Nov. 9
*Portico, Council	do	F. J. Coles, Clerk's Office, Ridings-road, Hounslow	do
Iron Bridge at Indrarny	Hackney Union	do	do

### CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by	Tenders to be delivered
Additions to Workhouse .....	Midway Union .....	G. E. Bond, Archt. High- street, Rochester .....	Nov. 9
Houses, Annamartyr, nr. Tipperary .....	.....	Rev. Father Connerly, C. C. St. Mary's, Tipperary .....	Nov. 10
Watering of P. Water .....	Ureawich Union .....	.....	Nov. 10
Sewerage Works .....	Coventry Corp. ....	J. Mansfield, Esqr., 55 Victoria - street, West- minster, S.W. ....	Nov
Market .....	Launceston T.C. ....	O. B. Peter, Archt. Launce- ston .....	Nov
County Court and Island Revenue Office, Wexon .....	Conna. H. M. Works Co. Electric Tramway	Office, Storey's Gate, S.W. H. Walker, Esqr., 10 Mall, Cork .....	Nov. 14
"Fire Engine, Fire Rep., Effect a small Fire hose, &c. ....	Apson, D. C. ....	D. J. Roberts, 32, High street, Ashton, W. ....	Nov. 15
"Make-up Roads .....	Tottenham U. D. C. ....	P. F. Murphy, 712 High street, Dublin .....	Nov. 15
"Supply and Laying of York Pavng Severage Disposal .....	..... Aylesbury U. D. C. ....	W. F. Taylor & Soan, Aylesbury .....	Nov. 16
Additions to Schools, Barnardorf .....	.....	Ameybone & Knowles, St. C. St. Glasgow-st. West, Newswall-road, Fyne J. T. Karush, C. De Roux Boulevard .....	Nov. 18
B. Bags Works .....	Ashton - under - Lysas Corp. ....	Tamara & Morgan, Archt. 10, St. James' - street, W.C. & C. Stevenson, C.E. 14 Grand - street, London Giles, Gough, & Trollope, 25, Devereux - W.C. ....	Nov. 21 do. do.
Schools, Pontlunfryn .....	Gelliger & B. B. L. ....	.....	Nov. 21
Timber Pier, Broadhaven, co. Mayo .....	Board of Public Works Ireland .....	.....	Nov. 24
"Chapel .....	Parish of St. Mary, Wexon, Bridget .....	.....	Nov. 24
Infant School and Additions .....	.....	.....	Nov. 24
"Wares in connection with Tunn and .....	.....	.....	Nov. 24
"Painting & the Athletic, King Lynn .....	I. C. C. ....	.....	Jan. 24, 98
"Repairs, Appr's hse, Making-up Road way Chesham, &c. ....	.....	.....	No date
"Bridge Approaches, &c. over Railway .....	Executive Committee Lanc. Victoria Railway Trustees .....	.....	No date
A Extensions to Church, Barkham, N.B .....	.....	.....	No date
Additions to Workhouse, Clatterbridge .....	.....	.....	No date
"Workhouse Infirmary .....	.....	.....	No date
Sto. & Premises, Saltwell-road, Gates head .....	.....	.....	No date
Laying Out Main, &c. ....	.....	.....	No date
Severage Works, &c. George Lane .....	.....	.....	No date
Add. to House, Millthorpe, Lark field .....	.....	.....	No date
Wares at Parish Church, South Wicks, Lincs .....	.....	.....	No date
Shops at 102 & 110, High-street, Lincoln .....	.....	.....	No date
Two Cottages, Cawick, Lincs. ....	.....	.....	No date
Scho. la, Daisfield .....	.....	.....	No date
Additions to House, Uxvaston .....	De Asbarnham .....	.....	No date
Water Works Extension, New Gann un .....	.....	.....	No date
Two Shops, Leeds .....	.....	.....	No date
Residence, Ls. Hants. ....	.....	.....	No date
Additions to Business Premises, Wharham .....	W. Crooks .....	.....	No date
Additions to Hospital .....	Bromley & Becker, Bank Joint Hospital B. I. ....	.....	No date

## PUBLIC APPOINTMENTS.

[illegible]

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii x. & xvii. Public Appointments, pp. xv. & xvii.

By G. TROOLIDGE & SONS.	Greenwich Marshes.—A block of riverside building land, area 14 a., f.	£7,000	Highbury.—187, 190, and 201, Blackstock-rd., u.t.	£1,150
Chelsea.—19, Cadogan-gardens, u.t. 79 yrs, g.r. 83/	By H. J. BLISS & SONS.		27 yrs, i.e. 304, r. 1451.	
By READEL, WOOD, & CO.	City of London.—Aldersgate-st., f.g.r. 305/2, reversion in 80 yrs.	7,000	By PROCTOR & WALKER.	
Blackheath.—Shooter's Hill-rd., f.g.r. rents 244/4, reversionary varying from 21 to 45 yrs. (in lots.)	2, 4, and 6, Shaftesbury-pl., f. r. 124/2, 165.	1,470	Norton Folgate.—White Lion-st., Job's Castle p.s., f.g.r. 704, reversion in 33 yrs.	2,514
St. John's Pk., f.g.r. rents 251/2, 215, and a peppercorn g.r., reversion in 53 yrs.	St. Leonard-on-Sea.—St. Leonard's-rd., f.g.r. 110/2, reversion in 20 yrs.	3,580	October 31.—By H. G. POTTER.	
Walthamstow.—F.g.r. rents 120/2, reversion in 43 and 44 yrs.	Stepney.—Ben Jonson-rd., f.g.r. 42/2, reversion in 14 yrs.	1,930	Hamstead Heath.—Elm-row, Lawn House, f.	2,795
St. John's Pk., f.g.r. 208/2, 198, 8d., reversion in 48 and 53 yrs.	Ben Jonson-rd., f.g.r. 134/2, reversion in 18 yrs.	350	By H. BOND & SONS.	
St. John's Hill, f.g.r. 42/2, 68, d., reversion in 48 yrs.	Rethel Green.—8, Church-row, f.	305	City of London.—179, Staining-lane, u.t. 27 yrs, f.g.r. 794, 105, r. 2404.	814
Vanhugh Pk. (including the Royal Standard p.h.), f.g.r. 27, 125, reversion in 53 yrs.	Hackney.—4, St. John's Church-rd., f. r. 32/2.	305	By W. B. HALLETT.	
Vanhugh Pk., f.g.r. 450/2, 25, reversionary varying from 45 to 63 yrs.	Clapton.—Chatsworth-st., f.g.r. 13/2, reversion in 83 yrs.	288	Holloway.—13 to 25, Lionie-pl., u.t. 14 yrs, f.g.r. 210/2, r. 873/2.	4,000
Westcombe Hill, 1 pepper-corn ground rents, reversion in 53 yrs.	Tottenham.—Haybourne-rd., f.g.r. 224, reversion in 52 yrs.	210	21, Spencer-rd., u.t. 494 yrs, g.r. 64, 68, r. 384.	46
Westcombe Hill, f.g.r. 437 68, reversion in 83 yrs.	73, Somerset-rd., f.	210	108, Hornsey-rd., u.t. 44 yrs, f.g.r. 64, r. 504.	38
Westcombe Hill, f.g.r. 102/2, 208, and a peppercorn g.r., reversion in 81 and 84 yrs.	Plaiestow.—21 to 31 (odd), Peter-st., u.t. 65 yrs, f.g.r. 24/2.	805	Clapton.—Chatsworth-st., f.g.r. 13/2, r. 84, e. 504.	46
Westcombe Hill, f.g.r. 184, 184, reversion in 74 yrs.	By NEWBORN, EDWARDS, & SHEPHERD.		Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; p.g.r. for ground-rent; f. for freehold; c. for copyhold; r. for leasehold; e. for estimated rental; u.t. for unexpired term; p.s. for peppercorn; yrs. for years; st. for street; rd. for road; sq. for square; ft. for feet; p.s. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.	
Greenwich.—Horn-lane, a freehold wharf and	Caledonian-rd.—1 and 2, Balmoral Grove, u.t. 63 yrs, f.g.r. 121.	480		
	Barbican.—151, Bedford-square, f.g.r. 124, 44 yrs, r. 74/2, e. 55/2.	470		





**NANTWICH**—For the execution of water supply works, Abraham and Calvey, for the Rural District Council. Mr. J. A. Davenport, C.E., 152, Hospital-street, Nantwich.—

*Abraham—Pipe-laying.*

Jenkins & Son ..... £743 3 1 Henry Dodd ..... £357 4 0  
Geo. Newall ..... £18 18 6 John Dodd ..... £347 4 0  
Cao. Newall ..... £45 15 6 Samuel Wood, Small  
Joshua Dale ..... £71 7 0 Mur-road, Crewes ..... £34 10 0  
J. T. Greedy ..... £72 15 6  
Abraham and Calvey—Messrs. Cochrane & Co.'s (Dudley) tenders for pipes were accepted, and Messrs. Blakeborough & Sons tenders for hydrants, valves, and fittings.

*Calvey—Pipe-laying.*

Geo. Newall ..... £370 5 0 Henry Dodd ..... £337 12 1  
J. Dale ..... £36 15 6 John Dodd ..... £347 4 0  
J. T. Greedy ..... £33 0 0 Cheshire (accepted) ..... £37 15 6

**ORPINGTON (Kent)**—For repairs to private residence. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, and Orpington—  
Somerford & Son ..... £145 10 0

**ORPINGTON**—For the additions and alterations to the Baptist Chapel, Orpington, Kent. Mr. G. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington—  
Stebbing & Pannett ..... £237 5 0 Somerford & Son ..... £157 7 0  
T. Knight ..... £82 0 0 Accepted.

**ORPINGTON**—For the laying of a new sewer, with conveniences of two private houses to same at Crofton, Orpington, Kent. Mr. G. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C.—  
F. P. Durbell ..... £108 0 0 J. Jackson ..... £112 10 8  
T. Lansbury ..... £170 15 0 Stebbing & Pannett ..... £41 13 0  
Pell & Sons ..... £10 0 0 Somerford & Son ..... £70 0 0  
Others ..... £20 0 0

**PONTARDULIAS**—For the erection of a school at Pontardulas, for the Llandovery School Board. Mr. J. B. Morgan, architect, Llandovery—  
H. Billings ..... £3,150 0 0 G. Mercer ..... £2,043 0 0  
E. Morgan ..... £3,150 0 0 Brown, Thomas, & John ..... £2,043 0 0  
W. Gregory ..... £2,043 0 0 W. Hopkins ..... £2,043 0 0

**POOL (Cornwall)**—For alterations to Free Church, Pool, Cornwall. Mr. Sampson Hill, architect, Redruth—  
W. H. Moyle ..... £291 0 0 J. Grey, Carpenter ..... £56 18 0  
W. C. Hodge ..... £281 0 0 W. H. Gray, Remouth ..... £56 18 0  
T. Willoughby ..... £13 10 0 John Roberts, Fowey ..... £20 0 0  
Accepted.

**PORT TALBOT (Wales)**—For the erection of drill-hall, &c., at schools. Mr. F. B. Smith, architect, Port Talbot—  
T. P. Stevens ..... £1,255 15 0 Jan. Davis ..... £295 0 0  
E. A. Thomas ..... £250 0 0 Leverton Bros. ..... £10 11 0  
Morgan Cox ..... £20 0 0 Jan. Nicholas, Port Talbot (accepted) ..... £95 0 0  
Stephen Rees ..... £115 6 8

**ROMFORD (Essex)**—For the erection of public baths, for the District Council. Messrs. Harrington & Ley, architects, 105, Fenchurch-street, E.C. Quantities by Mr. H. W. Simpson, 105, Fenchurch-street, E.C.—  
W. Greig & Son ..... £5,754 0 0 Kingless & Son ..... £5,025 0 0  
Balam Bros. ..... £5,754 0 0 T. Bray, Northchurch ..... £5,025 0 0  
Coulson & Loftis ..... £5,754 0 0 R. Wilmet ..... £5,025 0 0  
Accepted, conditionally.

**SNARESBROOK (Essex)**—For erecting a house at Snarebrook. Mr. E. Bates, architect—  
Snewin Bros. ..... £2,975 0 0 W. Shurmer ..... £2,655 0 0  
Smith & Son ..... £2,975 0 0 Smith & Son ..... £2,655 0 0  
Jolliffe ..... £2,975 0 0 Wells ..... £2,655 0 0  
& Son ..... £2,975 0 0 Holt & Sons ..... £2,655 0 0

**SOUTHBOROUGH (Kent)**—For the erection of Victoria Hall and buildings, London-road, for the Urban District Council. Mr. Wm. Hamer, surveyor, 137, Landon-road, Southborough. Quantities by Mr. C. Norton, Tunbridge Wells—  
R. Jarvis ..... £4,520 0 0 Strange & Son, Tunbridge Wells ..... £3,594 0 0  
Alliance Building Society ..... £4,520 0 0 Leverton Bros. ..... £30 11 0  
Crates & Son ..... £4,520 0 0 Loran ..... £3,594 0 0  
John Jarvis ..... £4,520 0 0 Avar ..... £3,594 0 0  
Punnett & Son ..... £4,520 0 0 Accepted.

**ST. MARY CRAY**—For the execution of building works at Ellingham Lodge, St. Mary Cray, Kent. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington—  
J. Lonsdale ..... £152 0 0 Somerford & Son ..... £120 0 0  
Stebbing & Pannett ..... £152 0 0

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and TIMBER MERCHANT  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
HATTON GARDEN, and 39, RAY STREET,  
FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
TRICESSES, DRY, AND FIT FOR IMMEDIATE USE.  
Telephone, No. 374 Holborn. Tele. Address "SNEWIN" London.

**SWANLEY**—For the erection of a further block of eight cottages at Swanley, Kent. Mr. St. Pierre Harris, architect, Ironmonger-lane, E.C., and Orpington—  
Stebbing & Pannett ..... £1,848 0 0

**SWANLEY**—For the erection of eight cottages at Hextable-road. Mr. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C., and Orpington—  
T. Loddie ..... £1,848 0 0 T. Knight ..... £1,799 0 0  
Stebbing & Pannett ..... £1,848 0 0

**WALDRON (Sussex)**—For additions to "Tanners Manor" for Mr. B. S. Russell. Mr. R. C. Tupper, architect, Balm. Quantities by the architect—  
J. A. Read ..... £1,943 5 0 | Strange & Son, Tunbridge Wells ..... £1,943 5 0  
Accepted.

**WALTHAMSTOW**—For six houses at Walthamstow. Mr. R. J. Lister, architect—  
J. A. Read ..... £1,819 0 0 | G. W. Barker ..... £4,775 0 0  
W. Shurmer ..... £1,795 0 0

**WALTHAMSTOW**—For the erection of premises at Heston, Walthamstow, for Messrs. Pickford & Co. Mr. Peter Dollar, architect—  
Patman & Fotheringham ..... £3,891 0 0 W. Shurmer ..... £2,793 0 0  
Sheffield Bros. ..... £2,425 0 0 Carnill ..... £2,793 0 0  
J. Grover & Son ..... £2,425 0 0 Higgs ..... £2,793 0 0  
Dove Bros. ..... £2,425 0 0

**WORKSOP**—For the erection of offices, engine-house, &c., for Messrs. Steel & Garland, Limited. Mr. John Alsopp, C.E., Worksop—  
C. Hest & Sons ..... £3,300 0 0 | R. H. Rawson ..... £2,020 0 0  
W. Hemstall ..... £3,300 0 0 | W. Hall, Worksop ..... £2,020 0 0  
T. Roger & Son ..... £3,300 0 0 | J. R. Vickers, Ltd. ..... £2,020 0 0  
Architect's estimate, £3,893 17s. 6d.  
Accepted.

## TO CORRESPONDENTS.

J. W. B. (amount should have been stated)—W. G. L. J. P. (below our limit)—J. T. F. (amount should have been stated).  
NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
We cannot undertake to return printed communications. Letters or communications (beyond news items) which have been duplicated for other journals are NOT DESIRED.  
We are compelled to decline pointing out books and giving addresses.  
Any communication to a contributor to write an article is given subject to the approval of the Editor, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.  
All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## J. J. ETRIDGE, Jr.

SLATE MERCHANT,  
SLATER and TILER.

ESTIMATES GIVEN FOR  
SLATING AND TILING,  
To be executed by Contract in any part  
of ENGLAND.

Penrhyn - Bangor,  
Oakeley - Portmadoc,

And other description of Slates Ready for immediate  
delivery to any Railway Station.  
Applications for Prices, &c., to  
BETHNAL GREEN SLATE WORKS,  
BETHNAL GREEN, LONDON, E.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 12s. per annum (13 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 25s. per annum. Remittances (payable to DOUGLAS FOUNDRY, 10, Abchurch-lane, London, E.C. 4) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by preparing at the Publishing Office, 12s. per annum (13 numbers) or 4s. 6d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## THE BATH STONE FIRMS, Ltd.

BATH,  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

## HAM HILL STONE DOULTING STONE.

The Ham Hill and Douling Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trak & Son  
The Douling Stone Co.).  
Chief Office:—Norton, Stoke-under-Ham,  
Somerset.  
London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Mettallic Lays  
Asphalte Company (Mr. H. Glenn), Office, 42,  
Poultry, E.C.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-rooms,  
granaries, tun-rooms, and terraces. Asphalte  
Contractors to the Forth Bridge Co. [ADVT.]

**SPRAGUE & CO., Ltd.,**  
Sole Agents for  
THE "E.R.A." PHOTO. BLOCK CO.  
4 & 5, East Harding-street, Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED  
accurately and with despatch.  
**METCHIM & SON** (8, PRINCE STREET,  
10, GEORGE STREET, WESTMINSTER)  
"QUANTITY SURVEYORS" DIARY AND TABLES.  
For 1899 will be ready shortly. [ADVT.]

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C.  
SUPPLY THE BEST MATERIAL AND  
WORKMANSHIP FOR BUILDINGS,  
DAMP COURSES, AREAS, ROOFS,  
WASHHOUSE AND DAIRY FLOORS.  
&c., &c.

This Asphalte was chosen to be  
laid at Sandringham, on the new  
General Post Office, and other  
important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

# IRON CISTERNS.

F. BRABY & CO.

VERY PROMPT SUPPLY.

LARGE STOCK READY.

CYLINDERS FOR HOT-WATER CIRCULATION

Particulars on application.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL:  
6 and 8, HATTON GARDEN.

GLASGOW:  
47 and 49, ST. ENOCH-SQUARE.

BRISTOL:  
ASHTON GATE WORKS, CORONATION-RD.



## ILLUSTRATIONS.

The Crown Theatre, Peckham.—Mr. Ernest Runtz, Architect	Double-Page Ink-Photo.
Design for a Country House.—By Mr. G. C. Horsley	Double-Page Photo-Litho.
Deir-el-Bahari: Illustrations to Mr. Newberry's Paper at the Architectural Association	Double-Page Ink-Photo.
Decoration for a Pianoforte.—By Mr. M. H. Baillie Scott	Single-Page Ink-Photo.
Design for Stained Glass.—By Mr. Leonard Walker	Single-Page Ink-Photo.

## Blocks in Text.

Diagrams Illustrating Tank and Cistern Construction	Pages 397, 398	The Crown Theatre, Peckham, Plan	Pages 408
Sketches at the Arts and Crafts Exhibition, Manchester	Pages 404, 405		

## CONTENTS.

Tank and Cistern Construction	397	Architectural Societies	408	General Building News	419
Notes	399	The London County Council	410	Sanitary and Engineering News	415
The New Architect	411	Archaeological Societies	411	Stained Glass and Decoration	415
Some Picture Exhibitions	403	Engineering Societies	411	Foreign	415
Sketches at the Arts and Crafts Exhibition, Manchester	404	Applications under the 1894 London Building Act	411	Miscellaneous	415
The Architectural Association	404	The London Building Act, 1894	412	Capital and Labour	416
The Crown Theatre, Peckham	408	Godalming Town Hall Competition	412	Legal	416
Design for a Country House	408	Difficulties in Sketching Buildings	412	Meetings	416
Illustrations of Deir-el-Bahari	408	The Student's Column.—Sound, Light, and Heat—XVIII.	412	Recent Patents	416
Design for a Pianoforte	408	The Books Received	413	Some Recent Sales of Property	417
Design for Stained Glass	408	Obituary	413	Tenders	419

### Tank and Cistern Construction.



THE following remarks as to the construction of water tanks and cisterns, and the strains they are subject to, have no reference to any existing structures of this kind,

but are intended to convey such general information as will facilitate the designing of a tank or cistern suitable for the position it is to occupy.

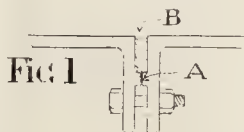
No matter what the shape, all the strains in the material of any tank arise from the weight of the water. The weight of a cubic foot may be taken as 62.3 lbs.; and of a cubic inch, .0361 lbs. It may be useful to mention that a gallon holds 277.274 cubic inches, and its weight is almost exactly 10 lbs., consequently there are 6.23 gallons in a cubic foot. The direction of the stress is always normal to the surface on which the water presses, and its force is proportional to the depth. Thus, at the surface, no stress is applied to the sides, and at a depth of, say, 100 inches, the stress per square inch will be one hundred times the weight of a cubic inch, or  $100 \times .0361 = 3.61$  lbs.

Owing to the even increase of stress with depth, it follows that the resultant total horizontal pressure acts at one-third the depth above the bottom of the tank; so if a rigid flat plate, such as one made of cast iron, form part of the side of a tank, and be acted on at that level by an equal and opposite pressure, the stress of the water will be met and the stability of the tank assured. If the plate be inclined, a vertical stress will be introduced which will alter the direction of the resultant to a position normal to the plate. It could be easily demonstrated that in a circular tank the stress caused by each horizontal layer of water produces a horizontal strain in the structure of the tank equal to the pressure at that depth multiplied by the radius. Thus at a depth of 100 in. in a tank with a radius of 100 in. the strain at that depth tending to burst the tank would be  $3.61 \text{ lb.} \times 100 = 361 \text{ lb.}$  If the sides of the circular tank are inclined, then, as before, the direction of the horizontal pressure is altered by the vertical pressure till it is normal to the surface of the sides. These are all the memoranda of a hydrostatic character it is necessary to keep in

mind when calculating the stresses on a tank due to the contained water. If the water pressure acts on the outside of an arch or circular tank the crushing stress is calculated in the same way—radius  $\times$  pressure.

In dealing with water there are important matters to be attended to, such as leakage and the effects of frost. When tanks are large it is useless to attempt to construct them in one piece, except in very rare cases. The consequence is that the greatest care and strict supervision has to be exercised in building them up. As the materials used are mostly brittle the foundations must be perfectly solid. There should be no fear of any portion of the ground sinking, consequently made ground should be avoided; but if that is impossible, it is necessary to make the best of it. It is not that there is any weight worth speaking of to be borne that attention is drawn to the subject, but often there is a sinking of the natural surface when interfered with, and if there is clay it may swell when water gets to it. If there is any suspicion of weakness the best plan is to consolidate the ground by driving in stones with a beater till no more can be forced down, and on this concrete can be placed. A modification on a small scale of M. Dulac's system as applied to the foundations of the Paris Exhibition of 1900 would secure success in any soil. He uses a steam pile-driver with various shaped rams. For light soils they are coned. With this he makes holes, which are filled with hard substances that the rams' further action forces sideways into the earth. The holes are made about 3 ft. apart. Sometimes he uses a mushroom-headed ram, which, however, is not equal to the cone for efficiency.

The next point to be treated is rendering the tank walls watertight. In the case of wrought-iron sides, the joints between the plates are caulked in the same way as ship plates, with cold chisel and hammer. Cast-iron plates should be planed and caulked with rust, the rust being on the side next the water and inserted in a groove left in the castings, as in Fig 1. A is planed and B



is the rust caulking. To render masonry, brickwork, or concrete sides quite water-

tight requires great care; in each case the face next the water should be coated with Portland cement plaster and rendered with neat Portland cement. To avoid cracks there should be no free lime in the cement. To ensure this it should be spread in a layer not more than 3 in. thick on the floor of a shed and kept there for two or three weeks, according as the air is damp or dry. While in the shed it should be turned over three or four times. The plaster should be at least  $\frac{3}{4}$  in. thick, composed equally of cement and clean, sharp sand, much depending on the cleanness of the sand. The finishing coat should be  $\frac{1}{4}$  in. thick of neat cement, put on before the plaster is quite dry. Brick or masonry walls should be laid in blue lias grout, plenty of water being used, and the stone and brick soaked before being built in. Instead of the cement plaster the walls may be coated with asphalt, but the above method of plastering has been found efficient. Wooden sides are seldom used except for circular tanks, in which case it forms the cheapest and also a perfectly efficient wall when properly carried out. Of late the staves are run between a pair of rollers, which compress the middle third of their edges, leaving a groove about  $\frac{1}{2}$  in. deep; the projecting edges are then planed off to the proper bevel, consequently when the staves are set up close together in place and the water let in, the compressed part swells and renders the joints between the staves quite tight. The staves should be of soft wood, such as Oregon pine or English larch, without knots. English larch will last about as long as oak.

The floor, and joint between it and the walls, requires much attention. It has been stated above that the foundation should be carefully prepared before concrete or anything else is laid on it. Having a good solid foundation, a layer of concrete, 9 in. thick, can be put down and plastered over with cement as described for the walls, to render it water-tight, and this plaster should be made continuous with that on the walls by being carried out at the same time. As in the case of the walls, asphalt can be used instead of the cement plaster; this latter floor might, in the case of a swimming bath, make it available for a roller skating rink in winter. If the walls are plastered and the floor asphalted, the asphalt should be carried up as a skirting 6 in. high on the plastered walls. When the walls are of iron and the bottom concrete, the iron should extend down into the concrete and a space should

be left between the iron and the concrete, about 3 in. in width, to be filled up with the 1 to 1 cement plaster, the neat cement being carried over it up to the iron. In wooden circular tanks the floor is made of 3 in. planed deal planks tongued and grooved, the groove being  $\frac{1}{2}$  in. deep and  $\frac{3}{4}$  in. wide and is best cut with a drunken saw. The tongues are of pine 1 in. by  $\frac{3}{4}$  in. This floor rests on and is fastened by screws to joists, sufficiently strong not to give when the weight comes on, and its edges are slightly bevelled to fit notches  $\frac{3}{4}$  in. deep made in the staves (see fig. 2). It will be seen that

FIG 2

Floor

Stave

much depends on the accuracy of the workmanship; still, to make sure that the joint between the floor and the wall is watertight, the notch in the stave might be paid over with india-rubber solution. That might also be used in securing the joints at the ends of floor planks when the diameter is greater than the length of available planks. These wooden tanks have one excellent quality, that of keeping out frost.

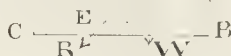
It is now necessary to describe how the mechanical effect of the stresses above mentioned should be resisted. The walls only need be dealt with, as it is understood that the floor and foundation are secured as above described.

When there is to be a straight or curved wall of brick, masonry, or concrete, without counterforts, it should be made of the strength necessary to act as a retaining wall, to hold up the backing when the tank is empty, as it is then that the greatest stress can come on it. For practical purposes, none of the formulæ for calculating the dimensions are worth much, as there are so many conditions and exceptions to be taken into account. In this respect the pressure of earth is very unlike that of water. It is therefore good policy to adopt dimensions that are known to meet the peculiarities of each case. However, as a general rule, it will be sufficient under most circumstances that the wall have a thickness at top of 14 in., and that the thickness at the bottom is one-third the height, the face battering accordingly. Immediately at the back of the wall there should be punned loose filling, especially if the rest of the filling or ground is clay. If the face of the wall is vertical, then the thickness at the bottom should be half the height. And if the slope of the face be 1 to 1, or flatter, it may have a facing of brickwork 9 in. thick set in Portland cement mortar made of 1 cement to 2 of sand, but the backing must be well punned in layers 9 in. thick. When concrete is used for a wall, to avoid cracks it should be laid in layers not more than 9 in. thick, and one layer should follow the previous one before it has set. If there is any doubt in a particular case whether the dimensions given above are sufficient, counterforts, projecting at the back, of half the thickness of the wall, might be built in

at distances apart equal to the height of the wall.

The horizontal pressure outwards of the water being known exactly, and never varying, except in proportion to the depth, the walls may very well be formed of a series of horizontal brick arches without backing, abutting against each other, the abutting points being sustained by walls or buttresses at right angles to the line of arches. These arches for moderate depths may be only one brick (9 in.) thick, and have a rise of 1 in 10; the bricks should be sound, and set in mortar; cement 1 sand 2. If the tank be 8 ft. deep the greatest pressure on the brickwork of the arches is at the bottom, and would be nearly 39 tons per square foot, the span being 10 ft. This strain is calculated by multiplying the water pressure by the radius. If the tank is deeper the thickness of the lower portion of the arches should be increased in proportion. The dimensions of the buttresses should be determined in the following manner. It may be assumed when concrete is used that there are no horizontal beds, in fact that they are homogeneous blocks. Their stability depends on their weight, therefore heavy material should be used in preference to light. A cubic foot is assumed to weigh 140 lb. Let A B C (fig. 3) represent the side elevation

FIG 3



of a buttress in which the height A B is 8 ft., and the base B C also 8 ft., G is the centre of gravity of the block, through which its weight, W, acts, and being one-third the height above the base happens in this case to be also in the line of the resultant horizontal pressure of the water, which is  $8 \times 10 = 80$  square feet area, multiplied by  $\frac{8 \times 62.3}{2} = 249.2$  lbs., the average pressure per square foot, making the resultant water pressure P = 19,936 lbs. The forces W and P have a resultant which, according to well-recognised practice, must pass through the middle third of the base to prevent the toe at C from crushing. Keeping to this rule, we can find the least proper thickness of the buttress by drawing G R, to represent the line of the resultant, just through the middle third of B C, and as far from the face, A B, as possible. If a parallelogram of forces be now constructed by laying off from G on G P the horizontal pressure, and from the point, D, so found drawing a line parallel to G W till it cuts the line of the resultant at E, the line D E will represent the weight of buttress necessary to sustain the water, and which happens, in this case, to be just the same as the resultant pressure of the water, viz., 19,936 lbs. As the area of the face of the buttress is 32 square feet, and the weight of a cubic foot 140 lbs., the thickness must be  $\frac{19,936}{32 \times 140} = 4.45$  ft., say, 4 ft. 6 in. It will be noticed that there is a dotted addition to the buttress at C; this is necessary to keep the concrete, where it is thin, from crushing.

This form of wall is suitable when the bottom of the tank is at or near the surface of the ground, and it enables a platform to be made round the tank cheaply when it is used as a swimming-bath.

In small tanks with straight sides composed of cast-iron plates the thrust of the water is often taken by tie-rods holding opposite sides together. In large tanks the variations in length of the ties joining opposite sides caused by changes of temperature prejudice the safety of the tank so much that the side plates are tied to the bottom plates by inclined rods if the bottom is composed of cast iron; if not, they must be supported by struts outside the tank. In that case it is best to incline the plates outwards, so that the line of the resultant thrust will pass into the ground at a short distance from the bottom of the plate. Thus (see fig. 4), let there be a series of plates A B,

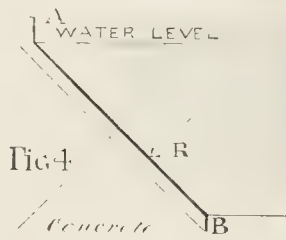


FIG 4

well stiffened with gussets, bolted together, and inclined to the vertical at 45 deg.; the resultant pressure of the water R will act normal to the surface of the plate at one-third the depth from the bottom as shown in the sketch, where it is also shown to be resisted by a mass of well-rammed concrete backing under the lower half of the plate. This is a safe form of structure, and in some localities may be the cheapest. Wrought iron or mild steel plates may also be used of proper form, but a great deal of riveting work would have to be done on the site by skilled mechanics, whereas the bolting of the cast-iron plates together can be done by any intelligent labourer.

Wood is not suitable for constructing straight sides of tanks unless leakage to some extent is permissible.

When tanks are of circular form, many difficulties as regards their sides are got rid of, as the water pressure produces only tensile strains of known force. They having been provided for, and leakage prevented, as above described, a satisfactory tank can be made. For instance, the sides of a tank 8 ft., 4 in. or 100 in. deep, and of the same radius, would have to resist a maximum strain of 361 lbs. of the lowest layer of water  $\frac{1}{4}$  in. thick, and as mild steel will carry safely 6 tons or 13,440 lbs. per square inch, a plate  $\frac{1}{27}$  in. thick would theoretically be sufficient, but it would not be practical to have so thin a plate. For a tank of the above diameter  $\frac{1}{4}$  in. thick plate can be used throughout when it is as much as 70 ft. or 75 ft. deep, or the tank may be same depth as before and 70 ft. to 75 ft. radius, say 150 ft. diameter. It is hardly worth while using a thinner plate than  $\frac{1}{4}$  in., which can be properly caulked. There should be as few vertical joints as possible, so the plates should be as long as obtainable. The horizontal joints may be lapped, but the vertical joints should have a cover plate on



both sides. If the plates are narrow, say 1 ft. effective, hydraulic riveting can be adopted, which is much superior to and cheaper than hand work. The top and bottom should be stiffened by angle iron rims.

When cast-iron plates are used the whole tensile strain comes on the bolts and on the plates as well, and as this material is very inferior to mild steel in resisting tension it should not be used for large circular tanks; further, it is stiff and rigid, and will not give like wrought iron or steel, should there have been any small error in setting out the circle.

The staves of wooden circular tank walls have no cohesion to each other. That has to be supplied by hooping them round with iron or steel rods, wire, or bars, the strength to be given to these being found, as before, by multiplying the pressure of the water against the side by the radius. Rods of mild steel are generally used. Before being fixed they should be bent to a slightly smaller circle than the tank, and it does not answer to make them too long, as then there is difficulty in getting them to squeeze evenly against the wood. The ends of these rods are swelled and screwed, passed through a casting, and tightened up with nuts; but there is no reason why an upright T iron should not have its head sunk into the wood, the bars going right and left through the web and tightened with nuts, as in the previous case; or it might be a channel iron, the bars going to the left through one web, and to the right through the other. If such a circular wooden tank be 50 ft. diameter and 25 ft. deep, the strain on the sides at the bottom works out as 3,249 lbs. per square inch, and, taking a steel rod as carrying safely 13,440 lbs. per square inch, rods one-fifth diameter would have to be placed near the bottom,  $3\frac{1}{2}$  in. apart, as hoops, to sustain the pressure, and, proportionally as the pressure decreases, wider apart higher up. Wooden tanks may be lapped with wire instead of hoops made of rods, with advantage.

In the Monier system of construction, wire or rods are used embedded in concrete, the former placed so as to take the tensile strains, the latter the compression strains, and in the case of the sides of circular tanks simply to keep the water in. They require great care in construction, and should only be adopted when specially skilled workmen are available. It may here be added that straight concrete walls with iron rods embedded in them, and properly placed in accordance with the rules of this system, might be used instead of the horizontal brick arches mentioned above for the sides of tanks.

It now only remains to mention that when tanks are supported on high towers any attempt to make them appear what they are not is neither good taste nor necessary, for a tower designed to show the lines of force will in general have the best effect in the situation. The essential points to be attended to in the design are that the top should be of greater diameter than the shaft of the tower, and that there should not be any batter in the latter. The reasons for these rules are (1) that bulk is required to hold the large quantity of water that warrants the trouble and expense of building the tower, and (2) owing to the great weight carried aloft batter is not required to enable the tower to withstand the horizontal pressure of the wind. The water towers at the Crystal Palace and those erected in various towns in

Holland, are good examples showing the effect of carrying out the above rules. All tanks in such a position should be circular, and the bottom should be supported in such a way that the weight of the water inside the supporting ring should equal that outside of it. Thus, if the tank be 30 ft. diameter, that of the tower should be 21 ft., which will give an over-hang of 4 ft. 6 in. all round. Tanks so exposed, if made of iron, should be lagged to prevent the water freezing, and a series of louvres on the outside would keep the direct rays of the sun from raising the temperature of the water.

#### NOTES.

London Water Supply.

WE very much doubt whether the London County Council will get any immediate practical result from the passing of the resolution to provide a Bill in the next Session of Parliament for the purchase, by agreement or compulsion, of the undertakings of the eight metropolitan water companies. It is certain that nothing of the kind will receive Parliamentary sanction until the Report of the Royal Commission has been made and fully considered; and even if the Report is presented during the Session, as we certainly think it ought to be, it will not be a document to be considered in a hurry. At the same time we do not think the Council are to be blamed for passing the resolution. There has been so much delay and procrastination in connexion with this very serious subject, that it is as well that any movement towards bringing it to a head, in one way or another, should not be postponed; and the attempt of the County Council to bring in a Bill with no further delay is likely at least to have some effect in accelerating matters. That the London County Council is the proper authority to deal with the water supply of London can hardly be questioned; so long as it is true to its duties and does not allow mere political considerations to interfere with them. That the municipality of a city should undertake its water supply is now becoming more and more an accepted principle in the case of the large provincial towns, and the London County Council is in the position of being the municipal governing body of greater London. That a necessary of life should continue to be supplied to the most crowded area in England by private companies, who naturally place the interests of their shareholders before those of the public, and whose aim is to supply no more water than they are obliged to supply, is a state of things which can no longer be supported. The most noteworthy sentence in Mr. Dickinson's able speech in support of the Report of the Water Committee was that in which he referred to the possible condition of the lower Thames in thirty or forty years, if the abstraction of water went on at an increased rate, when it would become only "a pond, oscillating backwards and forwards silt and filth, instead of the river that ought to run down to the sea." And that would mean in the end the destruction of the port of London.

M. Corroyer on Mediaeval Architecture.

OUR contemporary *L'Architecture*, the journal of the "Société Centrale des Architectes Français," publishes in last Saturday's issue a paper read by M. Corroyer at the annual meeting of the French Academy on Octo-

ber 25, the subject being "The Origins of Mediaeval French Architecture." We have on previous occasions taken exception to some of M. Corroyer's theories, especially those dealing with the origin of the pointed ribbed vault. The members of the five Academies must have been somewhat startled by some of the statements made on October 25. Among these we find one which informed them that St. Mark's at Venice was built after the Roman manner, the masonry cleverly put together, moulded so to say, and afterwards covered with a brilliant decoration, composed of stucco (*de stucs*) and mosaic. We should have thought that even a French Academician might be acquainted with the fact that the core of St. Mark's is built entirely in brick, and that it was afterwards decorated with marble panelling and marble columns brought from the East. M. Corroyer, by way of contrast, then states that St. Front at Perigueux was built in ashlar masonry of striking beauty in its majestic simplicity. The stucco, apparently, therefore was brought in to discredit St. Mark's in comparison with St. Front, and he may have appealed to the vanity of his audience if not to their learning. Again, M. Corroyer states in a note that the three pendentives of St. Front built with horizontal courses were reconstructed during the last century, without reference to their original bedding in courses normal to the curve of the pendentive. This is in distinct contradiction to the statement made by M. Lambert, the resident architect on the work, to Mr. Spiers, and quoted by him in his paper read to the Institute in February, 1896. (Page 254, *Royal Institute of British Architects' Journal*, 95-96.) The upper stones of the pendentives with horizontal beds are carried four feet deep into the pendentive, and could not be removed without bringing down the superincumbent dome. Again, speaking of the Syrian churches of the sixth and seventh centuries M. Corroyer says they are covered with barrel vaults, surmounted at the crossing with domes imitated from the Persians. But the two earliest barrel vaulted churches of Syria were those built by French masons at Byblos and Tortosa about 1130, in imitation of work long existing at Carcassonne and other churches of Provence, and the earliest instance of a dome at the crossing is in the church of St. Anne, in Jerusalem (1151), also built by the French, and now belonging to the French nation. The domes in question are all built in imitation of the domes of Perigord and Angoumois, and certainly by French masons. M. Corroyer here seems to have lost his opportunity of appealing to the patriotism of his audience. These are only three of the many errors which serve to characterise M. Corroyer's address.

MR. PREECE'S Presidential address to the Institution of Civil Engineers dwelt on the enormous strides which have been made in the use of electricity. His remarks on telephony were listened to with special interest in view of the recent report of the Select Committee. As electrician to the Post Office, Mr. Preece naturally regards telephony as an Imperial business, and considers that it ought to be in the hands of the State. Those who can appreciate the problems that the Post Office had to solve when it first took up long distance telephony, and the able manner in which the difficulties

Mr. Preece's Address.



were overcome, will agree with him in thinking that there would be no great risk in placing the management of ordinary telephony in their hands. At the present moment it is theoretically possible to speak to every capital in Europe, and although the cost is all but prohibitive, it may very soon be reduced when the proposed telephone cables have been laid between this country and Belgium, Holland, and Germany. Mr. Preece also touched on lightning conductors, in which he considered that very little real progress had been made since Franklin's time. This, however, is only partly true, for although there is not much difference between the modern method of using lightning conductors and Franklin's method, yet the great advances in the theory of electricity in recent years have enabled us to understand exactly how they act, and so enable us to keep them efficient. Mr. Preece also touched on the possible applications of wireless telegraphy to lightships, and pointed out that as this system was independent of day or night, fog, rain, or snow, it could be advantageously used, flashing its signals by electromagnetic disturbances into space, and thus, when ships were provided with receiving apparatus, giving them exact information of their position.

**Compulsion and Sanitary Work.** A SOMEWHAT curious case was decided last week by Mr. Justice Channell and a jury. The Sanitary Inspector of the Walthamstow District Council had served a notice on the occupier of certain premises to abate a nuisance arising from defective drains and to do certain work upon them. As a matter of fact the drains in question were legally a sewer, and therefore it was the duty of the Sanitary Authority to do the work. It was done, however, by the owner of the premises and her agent, a builder, who sued the District Council for the expenses. These it was decided they were entitled to recover, as the plaintiffs had acted under compulsion from the defendants, and not voluntarily. The Judge stated that the fact that the plaintiffs would have had a good defence to any summons before a magistrate did not lessen the actual compulsion arising from the notice. We confess that when there is no legal duty on a person to do a certain act which he is requested to do, the "compulsion" must be considered very slight. It is pretty obvious, however, that as the District Council ought to have done this work themselves, both Judge and jury would not be inclined to let them off paying for it, even if the person who actually did the work was under no legal duty in respect of it.

**Wolverhampton Workhouse Competition.** ACCORDING to the report in the *Wolverhampton Express and Star* of the 28th ult., the Wolverhampton Board of Guardians last week had a long discussion as to whether they should or should not accept the assessor's award in the Workhouse competition. The assessor, Mr. Aldwinckle, had decided in favour of the plans marked "North and South," by Mr. A. Marshall. Three votes were taken in succession for the substitution of three other designs, all ostensibly on grounds of economy, but in two instances it was pretty manifest that the real object was to get in a local architect. None of these attempts

assessor's choice was ultimately accepted by a large majority of votes. The most regrettable feature of the case was a letter written to the Board by Messrs. Mangnall and Littlewood and Mr. Johnson, of Manchester, joint authors of one of the designs, in which, after stating their belief that the estimates for the selected design were too low, they concluded as follows:—

"We are so convinced of what we now state that we will undertake to furnish bona-fide builders' estimates at our own cost, and take out the quantities, if the Guardians will do the same for plans 'North and South,' and if the estimates for our drawings do not come to 20,000l. less than 'North and South' we will make no charge for quantities, conditionally that the Guardians are then satisfied, and give us the work to carry out.

We should think this a proposal worth considering, and hope to hear from them."

That is a kind of letter which no competing architect ought to write, and to which, if written, no Committee ought to pay the slightest attention. In this case the Board put the writers of this letter up to be voted for, though, as already observed, the vote was not carried. One member of the firm whose signature appeared to the letter is, we regret to say, a Fellow of the Institute of Architects.

**A Railway "Accident."** It is reported that early last Saturday morning two goods wagons were derailed near Peterborough station, while being shunted, blocking up the main line. The signals were off for a mail train, but the shunters gave an alarm, the signals were immediately reversed, men were sent along the line with red lamps, and the train was fortunately pulled up. The commendable promptitude which thus averted a terrible disaster, would apparently have been unavailing had the passenger train been a minute or so earlier, and the good fortune of the Great Northern Railway only serves to further point the moral of the Great Central Railway catastrophe of a week or two earlier. The latter occurrence was designated an "accident," while that at Peterborough is called "a narrow escape." But, to our mind, the safety of the Great Northern express may fairly be regarded as largely due to an accident—a fortunate one; and while congratulating the passengers and the company upon their escape, we repeat that the incident justifies our remarks of a fortnight ago on the practice of shunting alongside the main line when passenger trains are due.

**Golders Hill, Hampstead.** WE learn, as mentioned in a paragraph under the heading "Open Spaces," on another page, that subscriptions by Vestries and other bodies towards the purchase of the late Sir Spencer Wells's house and its beautiful grounds are going on very well, and that it is proposed that the London County Council should adapt the house for a natural history and botanical museum in connexion with their technical education work, and retain the garden as a botanical garden for students and for the general public. If this is done, and if the gardens are kept as they ought to be, the public will have a new and charming pleasure ground, including a sloping lawn amid fine trees and commanding a most beautiful view to the westward. One cannot help regretting that a house which has so many associations with eminent names should cease to be a private home; but it is at least satisfactory to think

that the place is not to be laid waste for roads and building plots.

**Cowper's Homes in Buckinghamshire.** In the sale of the Weston Underwood Estate is included the house occupied by Cowper during nine years. In 1767 he and Mrs. Unwin removed from Huntingdon to Olney where, at "Orchard Side," a home was found for them by John Newton, then curate-in-charge of Olney. The house, of red brick with stone dressings, stands in the market-place, and the summer-house has been preserved. In February, 1896, were offered for sale the garden, which forms the subject of the third book of "The Task," and the adjoining "Guinea Orchard"; these were bought, we believe, by the then tenant, who had converted the orchard into a lay-stall. The orchard had its name from the payment of one guinea per annum for a right of way between the vicarage and the garden. In 1786 Cowper quitted Olney, and went to reside at "The Lodge," in the village-street of Weston, less than two miles distant. Walking from Olney to Weston one can readily recognise many of the places described in "The Task," written in 1783-4; such as, for instance, the "peasants' nest," the "rustic bridge," the "wilderness," and the "grove," with the barn wherein the thrasher plied his constant flail; the poplars whose fall he laments stood by the Lavendon Mills near the long bridge across the Ouse. The road passes by the estate, of about 1,000 acres, that belonged to the Throckmortons—the "Benevolus" of the poem was John Courtney Throckmorton. The manor-house was pulled down circa 1825, we believe; its Roman Catholic chapel was replaced with one built at the end of the old stables, and Cowper's sundial was set up in the officiating priest's garden.

**Society of British Artists.** It is to be feared that very little can be said in a general way of the Society's exhibition; but it contains one work of some interest—a small edition, in a decorative frame, of Mr. Holman Hunt's "May Morning on Magdalen Tower" (7), which is in fact more acceptable than the large one, as the hardness of execution is less prominent, or at all events less injurious, on this small scale, and the various studies of character in the heads render it a work impossible to pass over. Mr. Machell's "The Cup," a painting of considerable pathos and arranged effectively in a symbolically designed carved frame, which seems to have been rather inspired by Blake, is an original work which would lead us to expect more from the artist. Among pictures which are above the general level are Mr. Leonard Watts's "Across the Sands" (50), slack in execution but good in conception; Mr. Sanderson Wells's little work, "Minding Sheep" (57), Mr. C. H. Eastlake's "impressionist" landscape, "Autumn's Gold" (91); and Mr. Walter Fowler's "The Gravel Quarry" (174), a much better landscape than most in the room. Among the water-colours Mr. Kinsley's "Old Sandpit, Surrey" (210) and Mr. Lee Hankey's "A Grey Day" (246) are worth special notice. The vestibule contains a collection of drawings of architectural subjects by Mr. Hamilton Jackson, which are of some interest; and a screen in one of the small rooms is occupied by a large finished drawing and various sketches, all of architectural subjects, by the President, Sir Wyke Bayliss.



The sketches are excellent; they show this artist's powers as an architectural artist to much better advantage than his more elaborated works, and we are glad to be able to admire them unreservedly.

The President of the New Salon. M. CAROLUS DURAN has been elected President of the "Société Nationale des Beaux-Arts" of Paris, otherwise known as the "New Salon." The new President, whose real name is Charles Auguste Emile Durand, was born at Lille in 1837. In 1890 he was one of the most ardent partisans in the difference which sprang up in the "Société des Artistes Français," from which resulted the establishment of the rival Salon. M. Carolus Duran, as he has been long called, received medals in the annual exhibitions of 1866, 1869, and 1870, and in the international exhibition of 1878; was created "Officier" of the Legion of Honour in the same year; received the "médaillon d'honneur" of the Salon in 1879, and became "Commandeur" in the Legion of Honour in 1889. Though best known as a portrait-painter, he has paid some attention also to sculpture, and exhibited two bronze busts. His position in the New Salon it is not very easy to understand, inasmuch as his artistic methods and school are certainly those which are more generally represented in the Old Salon. After his election as President, the following other officers were elected: President of the section of Painting, M. Roll; of the section of Sculpture, M. Rodin; of Engraving, M. Walthner; of Decorative Art, M. Cazin. MM. Jean Béraud and Billotte are elected Secretaries, and M. Guillaume Dubufe Treasurer. Architecture seems to be omitted; and in fact it has never played any but a very insignificant part in the New Salon exhibition.

A Religious Guild for Architects.

WE have received the following letter from a lady, who is for special reasons interested

in architects and architecture:—

DEAR SIR,—There is a Guild of St. Luke for the Physicians and a Guild of St. Matthew, but I have long wished to hear of a St. Simon and St. Jude's Guild for Architects. The Collect, with its reference to the "Head Corner Stone," and ourselves being "made an Holy Temple," is so singularly appropriate, that one hopes such a Guild of unity for the service of God and the good of men may be formed.

You or your readers will know best how this might be inaugurated. ARCHITECTURA.

St. Simon and St. Jude's day, 1898.

St. Simon and St. Jude are, we believe, traditionally considered as the patron saints of architects, though on what ground we know not: that however is a minor matter. We fear that we cannot offer any suggestions as to the formation of such a Guild, and that the idea itself will be regarded by many—perhaps most—readers as out of date, or appealing only to a minority of specially orthodox Churchmen. Still, we willingly publish the letter for those who may be interested in it, and may add that with the feeling which prompted it, at all events, we are entirely in sympathy. A union with the object of connecting the practice of one's profession with the "Service of God," in the true sense of the words, could hardly have any but a good effect on those who entered into it. Only people may have different views as to the true import of those words, and some undoubtedly will regard the adoption of the name of a patron saint as an anachronism in these days.

#### THE NEW ARCHITECT: HIS WORK AND REGISTRATION.\*

In one of Thomas Hardy's earlier novels there is a description of a young architectural draughtsman engaged in measuring and sketching what is termed "a chevroned doorway, a bold and quaint example of a Transitional style of architecture, which formed the tower entrance to an English village church," and, as subsequently appears, was surmounted by "a battlemented parapet fired to a great brightness by the solar rays." The author goes on to describe the professional evolution of this youth, how "when quite a lad, in the days of the French Gothic mania which immediately succeeded to the great English Pointed revival under Britton, Pugin, Kickman, Scott, and other Medievalists, he had crept away from the fashion to admire what was good in Palladian and Renaissance"; how "as soon as Jacobean Queen Anne and kindred accretions of decayed styles began to be popular, he purchased such old-world works as Revett and Stuart, Chambers, and the rest, and worked diligently at the Five Orders"; how he got tired of the whole thing and took refuge in verse, till his father, the painter-Academician, threatened to cut short his allowance, and he "awoke to realities, became intensely practical, rushed back to his dusty drawing-boards, and worked up the styles anew with a view of regularly starting in practice on the first day of the following January."

We may pass leniently over the Transitional chevroned doorway, the battlemented parapets, and the like, and content ourselves with noting the author's ideas, probably shared by most of the public, as to how architects are made, or rather are not made, after the manner of poets and Swiss admirals. Unsophisticated as such notions may now strike us, they would have been nearer the mark in the days of Ictinus or William of Wykeham, when steel skeletons, sanitary plumbing, hydraulic and electric lifts, forced ventilation, steam heating, cooking, and washing, and electric lighting, the bones, arteries, and nerves of our buildings, had not to be cunningly interwoven with the features of inventive art into an organism almost as complex as the human body; when planning arrangements were as simple as it is possible to conceive; when the commercial and the domestic did not vie with the monumental; when material, labour, and room were secondary considerations; and the great problem of how to make a yard of land and superstructure yield the highest return had not given us the Chicago sky-scraper.

The man who successfully calls a great modern building into existence is as different from the architect of old as the New Woman from the housewife with whose appreciation Solomon closed his Book of Proverbs; the founding alone of Portrairie Lunatic Asylum would probably have driven Vitruvius into the Richmond. The New Woman! why not the New Architect? So long ago as 1568 Philibert de l'Orme heralded his advent, and drew him, to the never-tiring delight of William Burges, with as many organs of sense as one of the Four Beasts of the Apocalypse.

Before, however, we talk of the new architect—this great beast, as it were, of the century's revelation—we must be sure that we know what he is. Mr. Hardy (as we have seen) with the generality of his readers (as we may conclude) does not seem to know; we may think we know ourselves, but when we find, as we presently shall, that even Mr. Norman Shaw does not seem to know, we begin to rub our eyes and wonder if, after all, we are nearly through the twentieth century, and that Ictinus, Vitruvius, William of Wykeham, and Sir Thomas Tresham are really dead and buried. There is no use in looking in the dictionary, or attempting to differentiate the fine art of architecture and to argue from the thing made to the maker. We want *no a priori* definitions. The thing made, New Scotland Yard, the Hotel Cecil, Portrairie Asylum, or the late President's latest bungalow, stares us in the face, and the architect is the man who is paid 5 per cent. (by the owner) on the total cost (exclusive of furniture) for drawings, specification, and superintendence. I say "exclusive of furniture," as I am dealing with the typical cases only.

I do not suppose that any architect, even a

\* Inaugural address to the Architectural Association of Ireland, delivered by the President, Mr. Howard Pentland, R.H.A., on October 25.

Royal Academician, would gainsay that definition, and yet in the silly controversy that took place in the *Times* and elsewhere in '91 as to whether architecture was a profession or an art, it was only too plain that a *criterio* of so-called artist-architects existed gifted with qualities too ethereal for the hall-marks of the architect's and engineer's bill, and perched on too high a plane to be conscious of steel, steam, or electricity, save, of course, in respect of 5 per cent.

In a letter to the *Times* of November 11, 1891, Mr. Norman Shaw calmly contended (1) that an architect was a man whose qualifications could not be brought to the test of examination, and that (2) an architect was not such in respect of the scientific construction, &c., in which he should doubtless be proficient, but in respect of certain undefined artistic qualities, which, in his opinion, made a man an architect. The correspondence which followed in the *Times* and the *Builder* only showed how much can be written about words rather than ideas, and the necessity, as even Mr. T. G. Jackson, another Academician, finally admitted, of having some fixed relation between the two.

The controversy arose in a memorial presented to the Council of the Royal Institute of British Architects, signed by seventy architects and others, including fifteen members of the Royal Academy, and in a letter which the memorialists published in the *Times* of March 3, 1891, under the title of "Architecture a Profession or an Art." The very title assumes that the terms exclude one another. As a matter of fact, there are probably no two words in the language more loosely used and more calculated in such association to promote logomachy. We are not concerned, however, with the meanings of the terms "profession" and "art" except to ascertain the senses in which the memorialists used them, and it is clear from the memorial and Mr. Norman Shaw's letter that, in so far as their contention was concerned, they regarded the former as a calling which possessed amongst other characteristics a coarse capability of being tested by examination, and the latter as one altogether too spiritual for appraisal.

Before men attempt to pull the mote from their brother's eye they should cast the beam from their own. How can those who are themselves branded with the coveted hall-mark "R.A." declaim against the iniquity of a diploma in architecture or any other art? who hold yearly examinations for their own studentships and prizes; who every spring sit on the hanging committee at the great competitive examination in Piccadilly, and not only award the palm of place but temper their appreciation with the finer distinctions of "line" and "sky"?

Mr. Norman Shaw complains that a professional diploma admits of no nice distinctions; that it merely marks a minimum. Do the hall-marks A.R.A., and R.A., the bachelor's and doctor's degrees in the art world, admit of these nice distinctions? Do they reveal any gap between Mr. Norman Shaw and Mr. Aitchison? Then people forget that if art cannot be weighed in the balances taste sinks to preference, criticism to dialectics, and the *Grand Prix de Rome* to an empty honour. The whole position is so absurd that had it not been assumed one could scarcely realise its assumption.

The point has a double interest for us, however (1), in respect of our notion of the new architect, and (2), in respect of his capability for the registration which every day becomes more of a necessity. It would be quite possible for a paternal government to protect the public from bad art by passing bills for the registration of poets, musicians, painters and sculptors, as well as of architects, and I'm not at all sure that we would not be the better of it. Think of the doggerel rhymes, the Ta-ra-ra-boom-de-ay jingles, which have shortened our too short lives; the pots of paint which have been flung in our faces; the plastic abortions that haunt our gardens in life and our graves in death; the whittling that masquerades as wood-carving. Are these things that flinch the flavour of life a whit less harmful than the Chicago sky-scraper, the jerry-built tenement, the building that collapsed the other day at Westminster, or the public-house in Wine-tavern-street, which a local wag palmed off on Mr. Street as a posthumous work of the late Sir Thomas Deane? There is nothing in the nature of things which would go to make such spoon-feeding in art impossible; but we do not press for it. These monstrosities may not swell our asylums, but the architect may fill the



surgical as well as the fever ward, the graveyard as well as the Union; and with a free hand.

No amount of "high-falutin" (there is no other name for this contemptible nonsense) will get over the fact that artists of every kind can be and are measured and appraised just like any other people. We may put up with the moral injury of bad design, though I do not see why we should; but let us at least insure that it is accompanied by no injury to life or limb. "We think that no legislation can protect the public against bad design, nor could legislation help to prevent bad construction unless builders and all others who erect buildings were required to pass the test of examination as well as architects, inasmuch as architects are not employed in the majority of cases." So say these memorialists. Was ever a contention so apparently disingenuous? Because complete protection seems out of the question we are to have none! They forget that bad design includes bad construction, and that in the absence of legislation everybody who designs a building is the architect of that building, just as bad doctoring includes bad prescribing, and that in the absence of legislation every cheap jack who peddles pills at a fair may undertake a case. Imagine any sane man writing "we think that no legislation can protect the public against bad doctoring; nor could legislation help to prevent ignorant prescriptions, unless druggists and all others who give medical advice were required to pass the test of examination as well as doctors, inasmuch as doctors are not employed in the majority of cases"! I suppose people did think so in the days of the barber-surgeons, but they do not now.

And what is the result of this architectural free trade—and I include engineering, because it would tax the combined genius of the Royal Academy and the Institution of Civil Engineers to say when one begins and the other ends? That the medical architect and the medical engineer have arisen; men who in the intervals of their legitimate work are given to crossing the border and cunningly investing the work of others with the cloak of medical speech. They pose at congresses; they write books on domestic plumbing and municipal sewerage; they advise and take fees, and endeavour to oust the architect or the engineer whose business this is (don't forget that Mr. Norman Shaw designed a famous soil-pipe disconnection), and they are countenanced in their unprofessional invasion not only by a one-sided legislation which prevents their being paid back in their own coin, but by a clique of disloyal architects who seem quite unable to realise that what they regard as design *par excellence* should be bound up as indissolubly with the organism of which it is the manifestation as the human face and form.

I am glad to feel that these therapeutic poachers are not representative, and that their less hungry brethren would be as ready as I to condemn any methods where mutual issues are concerned but those of honest co-operation.

I have no more to say in respect of the *first* contention, that an architect is a man whose qualification should not be brought to the test of examination, and will pass on to the *second*—viz., that an architect is not such in respect of the scientific construction, &c. in which he should doubtless be proficient, but in respect of certain (undefined) artistic qualities which make him an architect.

The position, as I have already indicated, results from an inadequate idea of what architecture is, of the utter inseparability of what is termed scientific construction from the laying of one stone upon another. The artistic and scientific are aspects rather than factors of an architectural work. Man is so constituted that he cannot as much as split a sleeper from a log without some endeavour to make it sightly, and even the knowledge that there are such things as beds in quarries and grain in timber that a chisel will cut and a hammer will drive, is sufficient to give rise to scientific construction. It seems to me an insult to intelligence to have to point out that you cannot have architecture unless you construct, nor construction without science. The science involved in placing a stone in the best way in a wall or in selecting the straightest grain, differs only in degree from that involved in vaulting Salisbury Cathedral, roofing Westminster Hall, or spanning the Tay and the Forth.

A man must construct scientifically; and unless he is worse than a savage he must con-

struct in a pleasing manner. This is the whole contest of architecture. If the construction be not the best that could have been adopted from every point of view without increased expenditure, the design is in so far defective. Construction may fail to please in other respects than that of mere formal beauty; it may not tell its tale as well as it might; it may even tell a false tale and degenerate to a mere veil to conceal what the architect lacks—the genius either to present in *puris naturalibus* or to clothe with a lifelike skin.

The Augustan architect lacked both genius and the courage to present to a people who borrowed both literature and religion from the other side of the Adriatic, the Romanesque that lay beneath his varnish of Greek detail. The architect of Francis I., who designed the Church of St. Eustache, at Paris, deliberately smeared what might have been a very decent Gothic church with a very similar coat of Italian detail, and a century or so later we find the English Palladians side by side with the useful and modest Queen Anne and Georgian designing the elevation first, and then making the interior fit it instead of the other way about. How few people ever realise that even Wren, whose Italian work was tempered with French leanings, had not the courage to classicise the flying buttresses with which he was obliged to stay his nave vaulting, but built a sham second story, a mere screen wall, to hide it. Everything that leaves the hand of a designer, from a cathedral to a pitcher, should bear the honest stamp of its origin and use. There is, perhaps, no more hopeless confession, nothing more calculated to raise the ghost of Palissy, than that bathos of the potter's art, the straw hat that cools your butter, or the hen that hatches your boiled eggs.

There are doubtless some styles in which this characteristic of the best art of the best times has not been so prominent as in others; styles which in the hands of Boulle, Caffieri, and Martin, or of the more temperate Chippendale, Hepplewhite, and Sheraton, grew in exaggeration and extravagance from Louis Quatorze to the Regency, or graced the scenes with which Hogarth has made us familiar. The *bombé* commodes and tortured bureaux inlaid with tortoise-shell and nacre, decked with meretricious marquetry and Vernis-Martin, glaring with twisted and intrusive brass and gilded with ornolite, which characterise French design of this time, fairly beat down the guard of criticism, and almost persuade us, against our better judgment, that genius may condone or refinement alone for the worst license.

These *jeux d'esprit* are, however, more apparent than real exceptions to the general principle which, on reflection, all designers will endorse, viz., that in architecture (which in its most general aspect may be defined as the material expression of a human need beautifully satisfied) the artistic qualities which, according to Mr. Norman Shaw, make a man an architect, and the scientific construction in respect of which he is not an architect, are the warp and the woof of a fabric to whose existence both are indispensable. The artist-architect affects to disparage what he regards as the independent art of scientific construction, just as some engineers affect to disparage what they regard as a mere varnish of architectural detail; but if two factors are indispensable to a product, it is idle to disparage either in name of the other. I am afraid that the idea of the Augustan architect that his craft consisted in flinging a mantle of independent architectural forms around bald engineering rules both ends, and I do not know which is the greater fool: the man who looks down on construction from the pinnacle of his art, or the man who looks down on art from the pinnacle of his construction; the warp that despises the woof, or the woof that despises the warp! A crown of laurels may grace a human head, or a series of swags a marble frieze; but the beauty that is not applied is of a different order, and does not come at everybody's bidding.

If, as we have seen, it is impossible to eliminate either science or art from architectural design, the barrier between architecture and constructive engineering breaks down, and the thing is called by one name or the other, according as art or science predominates. The line between them is a mere convention, and as we all know, it is very hard to draw it. It matters little which term we use, but as architects existed before engineers, or, in other words, took all as grist that came to their mill,

before (owing to the advance of science) it became impossible for a man to excel, like Michelangelo, at both poles of his profession, I intend for the present to use the word architecture in its broader sense, to regard it as the material expression of a want more or less beautifully satisfied as judgment or funds dictate. This is a very important point, and the following considerations will drive it home—An art is the application of knowledge or science to some practical end. A fine art is its application to some product calculated to cause pleasure by means of a few of the more important or integrating senses, and the product may be either a representation or an invention. Such are poetry, music, painting, polychromy, sculpture, architecture, dancing, and the drama. Some of these products appeal only to one sense, others appeal to several; but it will be found that there is only one sense which alone and unassisted can give an adequate idea of each. Hearing alone can reveal poetry and music; the former represents, the latter invents. Sight alone can reveal painting and polychromy; the former represents, the latter invents. Touch alone can reveal sculpture and architecture; the former represents, the latter invents, and so on.

It is a matter of psychology that a man who saw but never felt could have no adequate knowledge of architecture, and the fact that there is a blind sculptor in France, M. Vidal, shows that touch alone suffices to reveal the nature of both sculpture and architecture. It is true that binocular vision gives an idea of solidity, but only as a judgment, first in conjunction with touch and afterwards alone. It is true that the contraction of the ciliary muscle gives an idea of solidity, but by means of the muscular sense of the eye and not of sight, which is only a sensation of the retina.

The fine art of architecture is therefore the fine art of inventive form as affording pleasure, and therefore irrespective of the practical use, if any, of the articles invented. But the articles which have to be made for practical use are so numerous and important that the fine art of architecture has been occupied in so designing them that they may afford pleasure, rather than in designing beautiful forms irrespective of their practical use.

I have shown that although the material expression of a want satisfied is not necessarily fine art (because it may be as ugly as sin, and man will not have it so), since our Aryan forefathers made their first paddle or built their first hut on the upper Indus, or wherever else anthropologists may locate them, man has, owing to his constitution, been totally unable to exercise his constructive irrespective of his artistic faculty; whatever he makes, be it for shelter, locomotion, defence, or any other purpose, it must please as well as serve. It may please without serving, but it may not serve without pleasing, so that as a human achievement the material expression of a want satisfied is incapable of consideration irrespective of the material expression of a want, to some extent, beautifully satisfied.

Now what are our material wants? Amongst other things shelter, highways, clothes, vehicles, weapons, tools, pottery, glass, jewellery, and the like. The fine art of architecture, as the fine art of inventive form, embraces the art not only of the architect ashore and aloft, but that of the engineer, the lapidary, the swordsmith, and the potter; nay, even the tailor and the milliner.

When we bear in mind that many of the great Italian painters were architects, engineers, sculptors, and goldsmiths, and designed robes for religious and political functions, we see that all that can form the subject of pleasing design comes within the scope of architecture. Before the inevitable division of design had given rise to as many callings as now, when a Michelangelo or a Benvenuto Cellini could turn without effort from a picture to a storage reservoir, from a statuette to a signet, and science was little more than common sense, one mind could compass the gamut of the crafts; but where shall be found the Admirable Crichton who can compass to-day those that minister to the wants of even a good hotel?

But on the other hand, it is universally recognised as a matter of business that one man must be made responsible for the design and execution of such works. Where two or more technical experts are employed by a non-technical individual or body, end-  
less difficulties may arise, and the works which like the Tower Bridge can be successful



fully carried through from start to finish by such joint employment are few and far between. So much has this been felt that it is usual to entrust the guidance of co-operative work to a consulting architect or engineer whose administrative knowledge of the practice of the several experts contributing to the complete scheme is more than sufficient to ensure harmonious co-operation and efficient results. Such, for example, has been the practice of the Board of Control of Lunatic Asylums where, to quote the Portraiture case, an architect, a waterworks engineer, and an electrical engineer were employed under the general administration of a consulting architect whose engineering experience peculiarly fitted him for this duty.

But even the cases where specialists, both architects and engineers, work under the generalship of a consulting architect or engineer must be comparatively few; the amount of a particular class of engineering work in a whole mainly architectural, or of a particular class of artistic work in a whole mainly consisting of engineering, may not be sufficient to warrant the employment of a special practitioner; and, as is often the case, there may be no independent practitioners in the class at all.

In a large architectural work such as that instanced, it may be of advantage to employ not only an architect but also a waterworks engineer and an electrical engineer, or even a sewage disposal engineer. But what of the other special works in which an architect is not necessarily a finished expert—steam heating, hot water heating by steam injection, heating and ventilating on the Plenum system, steam cooking and laundry work, and hydraulic lifts and accumulators, works that not only necessitate detail drawings and specification but which rule plans and sections, and therefore sky-lines and general artistic effect, internal as well as external, to an extent which those who have never worked out a practical scheme involving them are quite incapable of realising.

There are no independent practitioners in these walks of what may be termed architectural engineering, so the scheme does not work, and various makeshifts—such as the submission to the sub-architect of a limited number of proposals from manufacturing firms, specialists it may be in heating, blowing, washing, or steam cooking plant, with the proviso that no remuneration will be given, but that the client or board may employ the firm who in the opinion of the sub-architect submits the best scheme, having regard both to efficiency and economy—have to be adopted.

Satisfactory, but by no means the best, results are thus obtainable. Every manufacturing firm who may be requested to submit a proposal introduces its own manufactures throughout, and every factor or general contractor for the execution of the particular class of work in question who may be similarly requested, introduces the manufacture of the firm with whom he deals, so that the excellence that results from judicious selection and combination is eliminated, and you have to put up, say in a laundry job, with Jones's hydro-extractors, Smith's ironers, and Robinson's rotary washing machines, whereas you know that Smith is not worth a rap except for hydro-extractors, that most ironers except Robinson's are a snare, and that Jones only shines in rotary washing machines, not to mention the fact that all of them may—as the best of them frequently do—endeavour to reduce their stock of mangles, things which are completely out of date in a steam laundry, and propose to convert your ironing-rooms into a Turkish bath by not encasing your ironing-stove in a glazed enclosure where its heat may be radiated to some effect in airing fine things, or to adopt such old-world devices as drying-horses, when the best practice is to kill two birds with the one stone by using the Blackman or some other system of drying.

Compromise with evil as this may be, there are worse devices which architects have been known to adopt in matters they do not understand; they may say, for example, "Blowhard is a tiptop man for the Plenum system, I'll get him to work out the whole thing and give me a quotation, and I'll insert a money provision in the contract."

If an architect thoroughly understands the work and knows his man there may under some circumstances be no better method, but when he does not, how is he to judge of the reasonableness of the quotation or of the quality of the work? All that he can do is to

fall back on a clause which should always be an additional rather than a sole safeguard, viz., that the contractor is to enter into a written guarantee to keep his work in complete working order for one year from the date of the final certificate, whatever that may be worth.

This is not the way to do business. Every genius has his weak points. An architect should extend his professional knowledge in every way in his power, but if he requires help in any particular let him be the consulting architect for the whole as well as the specialist in those branches of his work which he has at his finger ends; let him engage a thoroughly good temporary assistant from a practitioner, a factor, or a manufacturer skilled in the work in question, or even another practitioner, and turn out complete drawings and specifications on which definite tenders may be invited. Not only will the tenders be lower, but the work will hang together as no patched combination of independent schemes ever can; and as his practice in such work increases he will soon gain the administrative, if not the complete, acquaintance with the special work in question, which, coupled with intelligent observation and inspection of good examples elsewhere will render him what he professes to be when he takes his 5 per cent., a good all round architect with strong points rather than a specialist with weak ones, which is about the best account that many architects could honestly give of themselves.

The frequent presence of such men as I have mentioned in an architect's office is an unmixed good, for in no other way can his pupils and junior assistants so effectively pick up what may be termed the accessories of their main work, and avoid such painful errors as drawing a boiler-house without room to stoke, or an internal cornice in the path of the main steam pipe.

Architects should take a lesson in these respects from mechanical engineers and naval architects. The mechanical engineer who likes to see a neat moulding on his boiler-doors, or his steam gauges grouped under the shadow of a little pediment such as the Babcock & Wilcox Company affect, or the naval architect who embellishes his bows with such modest scroll as is a rule content with his ordinary architectural attainments as his ordinary draughtsman may possess, but when a Pullman drawing-room car or a liner's saloon have to be turned out, he gets the best assistance he can, because architectural detail is not in his line; and the architect should go and do likewise. And with the more advantage, for it is ten times easier for an architect who can sketch to master a little corner of mechanical engineering, than for an engineer who cannot to acquire any artistic aptitude.

As I pointed out before, architectural practice melts into engineering, and the line that divides them, when it can be drawn at all, is very arbitrary; there is no architecture that does not involve some amount of scientific design, no engineering that does not involve some amount of artistic design. The difference is in degree, not in kind. The most suitable practitioner, having regard to the particular work to be done, should be employed, and every architect or engineer should, temporarily or permanently as his wants dictate, employ a staff chosen so that their aggregate ability in regard to current work is uniform throughout that work.

Thus, and thus only, in the absence of an excellence and uniformity in attainments which it were vain to expect in any man, can the new architect earn his 5 per cent. If the Royal Academy can't assess him at his true value, the public can and will.

#### SOME PICTURE EXHIBITIONS.

THE Institute of Painters in Oil Colours still suffers, and probably always will suffer, from having more wall-space to cover than it can provide for; but though there cannot be said to be any great work in the collection, there is perhaps a larger proportion than usual of pictures that can be looked at with pleasure. The President is certainly not at his best this year. His "Summertime" (10) is a weak and commonplace work even in regard to colour; and the portrait of Mrs. Sidney (196), though very fine in the colour of the accessories, especially the rich crimson wall pattern, is stiff and expressionless as regards the figure. On the other hand the exhibition boasts one of M. Fantin-Latour's masterly and original conceptions, "Le Lever" (248), not equal to the beautiful little painting under the same name ex-

hibited this year at the Salon, but nevertheless a piece of real poetry in figure painting, which may be compared with Mr. Kennington's merely pretty "Bathers" (254)—the ideal and the real in nude subjects. Mr. Melton Fisher gives the title "A Poem" to a half-length of a beautiful young woman in white (185) with a large hat forming a kind of dark halo (if the expression may be permitted) to her head, reading from a book as she walks. Of the same class, though with not nearly so much sentiment, is Mr. Godward's "Ethel" (237), a portrait of a very pretty girl in a purple velvet dress. Mr. Stock, who is a painter of ideas, goes rather out of his usual course in "Orion" (31), a half-length of a man in ordinary dress drawing a curtain from a window to show the dark-blue night sky and the constellation; a suggestive idea spoiled by the want of sentiment in the figure. Sir Coutts Lindsay's very bad painting "Love in Bonds" (65), which we remember years ago at the Grosvenor Gallery, makes a second appearance here which could have been well spared. Among figure subjects of the *genre* order Mr. Lomax's "Foul Play" (173), an eighteenth-century group of men around a card-table, is really interesting from the varied and powerful treatment of the heads, which are full of vigour and expression. There is character and pathos in Mr. Walter Osborne's sketch of two or three forlorn figures "In a Free Library" (176); Mr. Chevallier Taylor's "Jack Ashore" (219) treats a well-worn subject with more refinement and less commonplace than one usually finds in pictures of a sailor and his sweetheart; Mr. Edgar Bundy's "The Word" (339) is an effective painting of a group of theological puritans lighted through a green curtain in the window; and Mr. Joseph Clark sends one of his small groups of rustics, "Nothing venture, nothing have" (447) in which each face is a study. Among more imaginative subjects, again, is one contribution from Mr. Watts, "In the Land of Weiss-nicht-wo" (303), two little nude infants who seem made of bronze or something else than flesh and blood, but with a charm of rich colour about the whole; and Mr. Kennington's "A Study" (328), a half-nude woman kneeling with her head bowed in some affliction, is a suggestion which might be worked out into a fine picture. Mr. Wetherbee, the painter of landscapes to which a slightly-treated nude figure gives the keynote, shows a grand piece of colour in the landscape and sky in "Echo" (200), to which however the objection is that the figure representing Echo is hardly in an appropriate position for echo to act.

As usual, the good landscapes are more numerous than the good figure subjects; many of them, it is true, just pretty and nothing more. One is conscious of the contrast between mere prettiness and originality, in coming across Mr. Bartlett's small work "A South Devon Ferry" (21), a real and complete picture in the true sense of the word, with the unity of treatment and feeling which characterises the work of a true artist. It is a strange lonely-looking scene, with the old odd ferry house perched on a rising bank, and a single figure pulling towards it in a boat. In Mr. Yeend King's "Lake Side" (42) we have Mr. Ernest Parton at second hand; in Mr. John R. Reid's "A Dangerous Playmate" (56) a study, we imagine, on Southwold beach. Mr. Farquharson's landscape without a title (73) shows an effective study of foreground vegetation half-lighted through the trees, and a sun-lit meadow beyond; the cattle not very successful. Under the title "The Village Smithy" (83) Mr. C. E. Johnson paints an effective night scene in which an expanse of moon-lighted clouds contrast with the red light from the smithy window. Mr. Archibald Reid, an artist at present less known than he is likely to be, has an excellent little landscape "On the Banffshire Coast" (91), not equal however to his larger work in Messrs. Tooth's gallery, Mr. Cotman's "Spring Meeting on the Orwell" (109) is a beautiful sunny landscape in which a collection of small yachts form an incident in the middle distance; his "Flood Tide on the Orwell" (117) is also good, though not equal to the last named. Mr. Leader's "A Surrey Oak Wood" (145) is gratifying because it is somewhat of an escape from his usual mannerism.

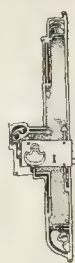
Mr. Fulleylove's "The Acropolis from below the Pnyx, Athens" (132) is an important work, and interesting as being what may be called a realistic and topographical view, but treated in a grand and broad style and with great force of effect. With this we may group Mr. Aumonier's fine work "Sunrise from Primrose



Hill" (386) in which, on the other hand, an atmosphere of poetry is imparted to a familiar scene. Mr. Wimperis contributes three works in his well-known broad and powerful style (which, however, always seem like water-colour effects translated into oil), of which "The Moorland Sign-post" (460) shows an exceptionally powerful sky. There is certainly a great sameness in his compositions, yet they cannot be called mannered—it is something higher than that, and he may be said to be the best successor to the mantle of David Cox. Now Mr. Orrocks's "Old Bridge, Elstead" (376), on the other hand, is mannered; the foliage is painted in a kind of mechanical way which is not either Nature nor (in the best sense) art; in his two other works he shows, as usual, fine qualities of breadth and aerial effect. Among other landscapes worth note are Mr. Blair Leighton's "A Summer Morning" (194), Mr. Walter Osborne's "A Connemara Village" (309), Mr. Elias's "Valley of the Medway" (203), Mr. Arthur Hacker's "The Orchard" (257), a very peculiar work in which the sunlight effect is rather crudely represented, but still it is not commonplace; Mr. C. W. Wyllie's "An Essex Fishing Village" (276), admirable in colour; Mr. Leslie Thomson's "A Normandy Church" (402), a finely built-up landscape; and Mr. Withers's "Whittinghame Woods" (300), a wooded landscape in what may be called a revival of an old school, not without interest though a little conventional. Mr. Brewtnall's fiery red effects in such works as "The Impending Storm" and "The Last Load" (242, 260) are things we protest against; they are Danby over again, and Danby at his weakest.

From the Institute it is a natural transition to the exhibition at the Fine Art Society's Gallery, of the remaining works of one who was for many years one of the best exhibitors at the Institute Galleries. Those who had been accustomed to know Mr. Charles Green almost entirely as a painter of delicately finished *genre* pictures marked by a great deal of character and humour will be surprised to find that in the collection at Bond-street almost the best things are the landscapes, many of which, all of them works on a small scale, are beautiful, and reveal a side of this charming painter's talent which was almost unknown to the public. Considering the care with which he paints the accessories in his interiors it is not surprising to find a number of very careful studies of furniture, bits of interiors, architectural fragments, such as old gateways, &c. all of which are admirable, and quite worth having on their own account, although their main intention probably was to furnish backgrounds or accessories for figure subjects. Considering that Green, so far as we remember, never exhibited a nude subject picture the number of small and highly finished nude studies is also a surprise, and serves to show how carefully he studied his figures; but we do not think that in themselves they add to his reputation; they are merely realistic model studies, not always quite well drawn, and with no kind of sentiment imparted to them. The best in an artistic sense is the sketch of a seated figure (47) half turned away from the spectator. The little full-length, "A Bacchante" (70) is pretty. Of the kind of talent for which Green was best known there are many admirable examples in his sketches of figures of men and women, many of them studies for finished pictures; these are full of character; and one complete scene, "The Broken Window" (42), reminds one of Wilkie at his best. In the same gallery is a collection also of caricature sketches by Mr. J. F. Sullivan, the author of a series of satiric studies of "The British Workman" in we forget which comic paper, which will be long remembered. The drawings are very humorous and clever examples of caricature; whether they quite claim to come under the domain of "art" may be a question.

The small collection at Mr. McLean's Gallery in the Haymarket contains no work of very great interest; the best thing is Mme. Dieterle's "Cattle at Pasture," a thoroughly good work of its class. De Hoog's "Fisher-man's Home" is a kind of second-hand Israel, good enough in itself if one could forget Israel. Wertebek's landscape and cattle pictures have very good qualities, for which he owes something to Mauve; and Bishopp's interior, "A Dutch Home—The Young Mother," is a very good work of its class. There is also a picture by Munkacsy, "The Nursery," to which we may



FINGER-PLATE  
BY J. C. COAR



FINGER-PLATE BY  
JAMES SMITHIES



LEADED LIGHT BY  
A. ANDERSON

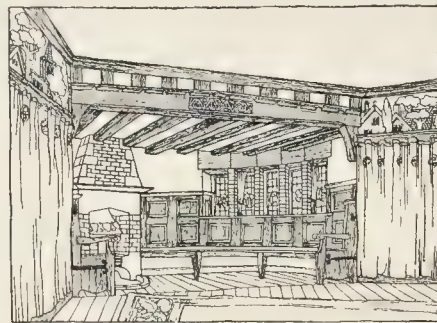


OVERMANTEL IN WOOD AND BRASS REPRODUCE  
BY JAMES STEWART & A. J. COAR



WROUGHT IRON CABINET  
EVERY FIVE BY EDGAR WOOD

## AT THE ARTS & CRAFTS EXHIBITION MANCHESTER SKETCHED BY W. EDWARDS SPROAT



A CHAIR (STAIN) DESIGNED BY  
D. SCHRADE

DESIGN FROM SINGLE BOOK  
BY D. SCHRADE

apply President Lincoln's phrase—"For those who like that sort of thing, it is just the sort of thing they would like." Messrs. Tooth's exhibition next door includes the really fine and original work by Mr. A. D. Reid already referred to—"A Highland Farm," a work possessing real "style," and of the best kind. There are two small Corots, one of them a beautiful work, and a fine little landscape of Daubigny's; Mr. Leader is seen at his best in "Surrey Sheep Pastures;" and there is an admirable example of Mr. H. W. B. Davis, "On the Upper Wye," which, like Mr. Crofts' "Charles II. at White Ladies," we seem to have seen before; and Mr. Marcus Stone's "Love at First Sight," which, whether one has seen it before or not, is exactly like a great many other pictures by the same hand. One of the best things in the room is Mr. Blinks's small picture "Here They Come," a set of foxhounds scampering up to the foreground with a swing and go in their action which is admirable; the subject is not of much interest in itself; but it is first-rate work of its kind, and that is always interesting.

## SKETCHES AT THE ARTS AND CRAFTS EXHIBITION, MANCHESTER.

THESE sketches, by Mr. W. E. Sproat, of Liverpool, may be interesting as a reminiscence of the recent Arts and Crafts Exhibition at Manchester, which contained much interesting work, and will probably have been the beginning of a new impulse to decorative art in that neighbourhood.

APPOINTMENT.—Mr. A. J. Dickinson, of the Building Department, Sheffield City Surveyor's Office, has been appointed Borough Surveyor and Water Engineer of Pwllheli, North Wales.

## THE ARCHITECTURAL ASSOCIATION: EXCAVATIONS AT THEBES.

AN ordinary fortnightly meeting of this Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. G. H. Fellowes-Pryne, President, occupying the chair.

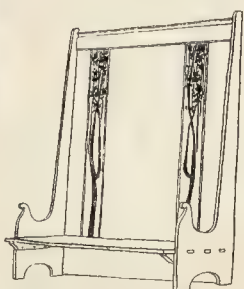
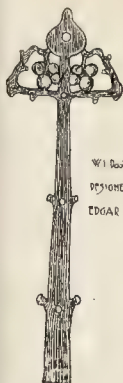
The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. D. Good, A. R. Brown, E. A. Agutter, Leonard Judge, F. J. Turner, F. G. Allsopp, T. B. Ball, H. R. Bird, E. D. Ford, H. J. Gravenor, R. Knott, J. Mansell, H. J. Marshall, E. J. Martin, G. J. Morris, C. P. Moss, J. Myers, S. V. North, W. Paice, jun., A. G. A. Quibell, R. M. Reeves, F. V. Rider, W. H. Rogers, G. L. T. Sharp, G. S. Simpson, M. Skinner, C. F. Skipper, W. Thornton, J. E. Tindall, H. M. Whiddington, C. S. Yates, C. E. Simmons, C. H. Smith, A. Durst, E. Brantwood-Mull.

The Chairman announced that the following gentlemen had been reinstated, viz., Messrs. E. E. Fetch, E. C. Nisbett, and G. G. Wallace.

The Chairman then nominated Messrs Alfred H. Hart and H. A. Satchell for seats on the committee, in accordance with by-law 35. As no other nominations were received, these gentlemen will be elected at the next ordinary meeting.

Mr. Howley Sim proposed a vote of thanks to those gentlemen who assisted in making the recent conversation at King's Hall a success, viz., glee singers: Messrs. G. Dixey, J. Charrington, F. A. Ellis, and G. May; for exhibits, Messrs. Martin Bros., Doulton & Co., and De Morgan & Co.; and for the loan of pictures and drawings, Sir Wyke Bayliss, and Messrs.



OAK CHAIR  
BY J. E. COOPERSTAINED GLASS WINDOW  
BY J. E. COOPER & J. A. JONESOAK CHAIR BY  
EDGAR WOODGLASS WINDOW  
BY A. L. DUFFIESETTEE IN OAKUM WOOD WITH CROSSLING  
MADE BY PEARSON & PEARSON DESIGNED BY  
EDGAR WOODLAMP BY  
J. E. COOPERWOODEN CROSS  
DESIGNED BY  
EDGAR WOODVASE  
BY JAMES JONES

LEADER GLASS WINDOW BY WALTER J. PEARCE

AT THE ARTS  
AND CRAFTSFURNITURE MANUFACTURE  
DESIGNED BY EDGAR WOOD

on the Nile post-boat give a more fitting preparation with their uninterrupted hours on a glassy water, through a landscape monotonous enough, but with a strange incomprehensible fascination of its own."

To continue the quotation in the writer's own poetic words: "As one goes further south, the colouring becomes more vivid; the hills are no longer tinted with pale pink and purple, but glow at evening with the colour and transparency of a sunset cloud, or like snow peaks with their rose light and aerial blue shadows. At last, where the hills, no longer flat-topped, but with sharp peaks and jagged outline, open out round a fertile plain deep in corn, one comes to Luxor. It is sunset when one arrives by the post-boat; the sky glows behind the Libyan hills, the water towards the west is a sheet of gold and crimson, the pylons and obelisks of Karnak rise black on the left. Under the hills on the west bank one can faintly trace the white terraces and colonnades of Deir-el-Bahari; the Colossi are no more than two misty points against the hill; the giant pillars of Luxor stand out against the purple sky where night rushes up from the east; and Thebes is reached."

To give a clear conception of the position of our work and its relation to the surroundings I have here a map of a part of the Theban district taken from Lepsius' "Denkmäler." It will be seen that on each side of the Nile stretches a belt of fertile land; it is much wider on the east side, extending for perhaps four miles from the river to the mountainous desert of the Arabian hills beyond. Here by the river are the remains of the mighty temples of Karnak and Luxor, created for the worship of Amon, and the work of many generations. On this side stood the ancient city of Thebes. It will be seen that the map shows the cultivated land on the west side to be only a narrow strip, which ends as abruptly at the foot of the barren limestone cliffs as a lawn adjoining the gravel walk in a garden. Egyptian tombs were always placed in the desert, partly that they might be beyond the reach of the Nile, and partly because every inch of cultivated ground was, and is, so valuable. The hills here are regularly honeycombed with tombs, and this western side is simply one vast necropolis, the biggest in the world. The northernmost cliffs, known as the "Drah abu' Neggah," contain the earliest tombs. To the south-west is the entrance, a narrow gorge, to the natural amphitheatre of cliffs in which the temple of Deir-el-Bahari is situated. Beyond in the desert is the wonderful valley of the Tombs of the Kings, approached either by a ravine north of the "Drah abu' Neggah" or by a steep mountain path over the cliffs. On this side of the river are also the Ramesseum, the temples of Seti I., Medinet Habu, Der el Medineh, as well as the famous Colossi. Lepsius believes that the temple of Deir-el-Bahari was formerly connected with Karnak, since the axis of the prolonged dromos would lead straight to the great temple of Amon. The remains of the Sphinx Avenue, from Karnak to Luxor, can be traced, and in places the ram-headed monsters are still to be seen.

The ancient Egyptian name of the city is read as Uas and its scriptural name was No, or No Amon, the city of Amon; no satisfactory explanation has been given as to why the Greeks called it Thebes, a name borne by cities in Boeotia, Attica, Thessaly, Cilicia, Asia Minor, &c.

It will be convenient here to briefly remind my audience that Egyptian history is divided into dynasties.—These are grouped into the Ancient kingdom, including the I. to VI. dynasties, the Middle kingdom, XII. to XVI., and the New empire, XVII. to XX., which is dated at 1600 B.C. to 950 B.C. Following this is the period of foreign domination, XXI. to XXV. or 950 B.C. to 663 B.C.—the late Egyptian period, XXVI. to XXX. or 663 B.C. to 332 B.C., and the Græco-Roman time which includes the Ptolemies, the Romans and the Byzantines, from 332 B.C. to 640 A.D.

The history of Thebes under the Early empire is veiled in uncertainty, but it is known to have been the capital of a nome or province and was ruled by princes of its own. A VIII. dynasty tomb has lately been discovered in the Drah abu' Neggah, by my brother, Mr. Percy Newberry. In the Middle kingdom, Thebes rose to a more commanding position, but its greatness dates only from the beginning of the New Empire, or, say, 1600 B.C. The liberation of the country from the Hyksos

Haig, H. W. Brewer, A. W. Weedon, and the Water-colour Class. With the vote of thanks, which was heartily agreed to, the name of the Hon. Secretary of the Entertainment Sub-Committee, Mr. G. B. Carvill, was associated.

Mr. Sim also proposed a vote of thanks to Mr. Arthur Cates for a donation of office fittings, forty books, &c. This having been agreed to,

The Chairman called on Mr. J. E. Newberry to read the following paper, entitled "Excavations at Thebes."

When the Committee of the Architectural Association asked me to read a paper on "Excavations at Thebes," I accepted without much thought of the great range that such a generalised title might be taken to embrace; for the site of ancient Thebes is the place of all others in Egypt where digging for antiquities has been carried on from the earliest times. Professor Petrie remarks that what we now find are but the last leavings of a hundred generations of incessant pillage. But this paper will only deal with the excavations that I personally assisted in making during two seasons' work for the Egypt Exploration Fund, and, by the kindness of the Committee of that Society, I am able to show you a series of lantern slides from photographs taken whilst we were unearthing the Temple of Hatshepsut, now known as Deir-el-Bahari, or the Convent of the North. The result of this excavation, to quote an article in the *Edinburgh Review*, "has been to give back

to the world a temple which, though ruined in some parts, unfinished in others, is, perhaps, the most beautiful, certainly the most original in Egypt, and the earliest of those now standing on the plain of Thebes."

I propose to divide my paper somewhat as follows:—

First, a description of the site and surroundings of our work, with a few slides in illustration. Second, a brief sketch of the vicissitudes that this temple has passed through, which, to be intelligible, must include a recital of a few of the facts of ancient Egyptian history.

Then I will endeavour to describe our mode of work; the architecture of the building and its details; and finally will show you photographs of a few of the antiquities that have been discovered there.

The site of the ancient city of Thebes in Upper Egypt is now marked by Arab villages, the principal being Luxor, Karnak, and Gournah, some 450 miles from Cairo by the river. When I returned from there in 1894, the railway alongside the Nile from Cairo only extended to Sohag, but now it passes through Luxor and Assuan, on the way to Khartoum.

But no one should attempt a first visit by train if he can possibly afford the time and extra expense of going by steamboat or better still by dahabiyeh. The *Edinburgh Review*, in the article which I have already quoted from, aptly remarks that: "One cannot journey into the past of some four thousand years ago in thirteen hours of noise and dust. Five days



and the reunion of the kingdoms of Upper and Lower Egypt was directed from Thebes, and for centuries it continued to be the favourite seat of the Pharaohs. Historically, the interest of Thebes centres on one of the most fascinating periods of Egyptian history—the XVIIIth, and XIXth. dynasties, being the time of the Amenhoteps, Hatasu, or, more correctly, Hatshepsut, the Thothmes, Sedi, the Rameses, and Merenptah, of Israelitish fame.

But the sun of Thebes began to set when the Royal residence was transferred to Lower Egypt in the XXist. dynasty. Alexander the Great and the Ptolemies probably found Thebes still a great, though decadent city, but they assisted to embellish it, as some buildings of this period attest. After many rebellions, the great city revolted for the last time in 30-29 B.C., taking part in the insurrection of Upper Egypt against the oppressive taxation of the Romans. Cornelius Gallus, the prefect, overthrew the rebels, and is said to have utterly destroyed the ancient town.

From this time Thebes is only mentioned as a goal for inquisitive travellers, who, under the Roman emperors, were attracted to the Nile by two monuments in particular, the Pyramids, and the musical Colossus of Memnon. The introduction of Christianity and the edicts of Theodosius were followed by the destruction of many pagan statues, and the obliteration of countless inscriptions. Later the rock-cut tombs, at first occupied by Christian hermits, were converted into peasants' dwellings; Christian churches were erected in the temple halls, and mud-brick houses built between the columns of the Temple of Luxor. Carefully worked blocks and slabs were removed from the monuments, which were used as quarries, and much beautifully carved limestone has been burnt for making lime.

In considering the history of the temple of Deir-el-Bahari we must first glance at what we know of the reign of its great founder, Queen Hatasu, or Hatshepsut. In the first excavation of the temple it was not at once discovered that she was its founder, as in nearly all the inscriptions the name of her successor, Thothmes III., has been substituted for that of hers. But further observation has shown that, although she is always depicted on the reliefs in male attire, the personal pronouns in the inscriptions are feminine, and the names of the king were incised deeper than the surrounding hieroglyphic signs. Such usurpation is not uncommon among the Egyptian kings, but the persistence with which every trace of the queen's reign has been erased seems to point to something more than the mere desire for fame. This destruction is attributed to the queen's nephew, Thothmes III., and the reason may be found in the history of the succession. Professor Petrie in his "History of Egypt" says that the father of Hatshepsut, Thothmes I., died before he had a son old enough to succeed him on the throne; some five or six months before his death, and whilst he was probably in failing health, he associated his daughter with him, as she was the heiress in the female line, in which royal descent was specially traced. She was then about twenty-four years of age and of great capacity and power. Two or three months later the king married her to his eldest son, Thothmes II., who would otherwise have had no claim to the throne, being the son of Mutnefer, who was not a royal princess. Ten weeks later Thothmes I. died. His son, who was now king in name, was but seventeen years old, appears to have shown no abilities, and must have been a weakling; for he did not go on any campaigns, undertook no wars, in fact, did no great work of any kind, and at thirty he died. During his life his sister probably entirely organised public business, and at his death she was left sole legitimate ruler at about thirty-seven years of age; the only person who could challenge her power being her little nephew, Thothmes III., then, perhaps, nine years old. He had no claim to the throne, being the son of a woman named Isis or Aset, who was not of royal blood. But Professor Petrie considers that his aunt did all she reasonably could be expected to, for she associated him with her in the kingdom, public dating of documents was carried on in his name; and she married him to her second daughter, Meryt-ra, as soon as might be, and thus gave him the position of heir. If she held on firmly to her royal prerogative, she only did what any other capable ruler would have done.

No doubt it was galling to a very active and ambitious young man to be held down to

peaceful pomp and routine. . . . But, to quote Professor Petrie again, all things come to him who waits. Egypt developed greatly during this twenty years of peace and progress, and at the Queen's death, Thothmes III., now thirty-one years old, succeeded to the full power. He was then able to launch into that mighty series of campaigns which mark the highest extent of Egyptian power and which gloriously occupied twenty-eight years of overworking energy.

We can now form some idea of the force of character and ability of Queen Hatshepsut by the fact that she is, as far as we know, the only woman in the great historical period that they overcame the prejudices of a changeless people and broke the male line of succession. By one means or another she kept her throne and only after many years could her mighty nephew break his vengeance on her monuments.

But Hatshepsut's temple suffered at other hands than Thothmes III. Amenophis IV., Khuenaten, or, as the name is now read, Akhenaten, the so-called heretic king, hacked out here, as everywhere, the figures and names of Amon-Ra, and the inscriptions and reliefs were left thus mutilated until the time of Rameses II., who restored them, though in a style unworthy of the first hand. For centuries after the temple remained practically unaltered, though there are evidences that the unfinished northern colonnade was used by a colony of embalmers as early as the XXIInd dynasty, and many burials have been discovered in this part of the XXVth. dynasty. Under Ptolemy Euergetes II. a few minor restorations and some important additions were made. On the introduction of Christianity a community of monks established themselves, and founded a Coptic convent, known to the Arabs as Deir-el-Bahari, which was built with bricks brought from an edifice of the XXVth. dynasty at the Assasif. The chambers of the temple were converted into chapels, and the "heathen" representations on the walls barbarously defaced.

The earliest detailed description of the place is given in the account of the French expedition of 1798, and later on we read of it in the works of Wilkinson, Lepsius, and Mariette, the latter of whom undertook important excavations in 1858, and published a monograph on the temple.

But it was reserved for the Egypt Exploration Fund, under the able guidance of M. Naville, to bring to light one of the most interesting temples of Egypt, of which up to 1892 two-thirds were covered by mounds of rubbish that reached to a height of 40 ft. in places.

As I am addressing an architectural audience I cannot do better than begin my description of the temple with a ground plan. This only reaches as far east as the lower colonnade, the excavation of the lower part not having been commenced when the drawing was prepared.

The plan is very remarkable, quite different from all other temples in Egypt, and was probably suggested in great measure by the site.

It consists of three great terraces or platforms cut out of the east slope of the mountain, and rising one above the other from the level ground, the upper platform being backed against the vertical cliffs, which here rise to a height of 384 ft. Centrally placed sloping ways, or inclines, lead from terrace to terrace, and along the front of each terrace the ceiling stones of the one above were carried over on the top of a double colonnade, thus forming a kind of cloister underneath. The upper and part of the middle platforms are terminated by a series of chambers, excavated and then built into the solid rock.

The sphinx avenue, some 24 ft. wide, with trees planted at intervals, led from the plain, or perhaps the river, to the gateway of the lower court, or entrance to the temple precincts, and formed a continuation of the axis of the temple, running approximately east and west. Only the scantiest traces remain, but these are enough to show that the gateway or pylon had a tree on either side, the stumps of which still remain. This first court, or lower platform, measures about 325 ft. by 263 ft. wide; and the excavations have proved that it was treated as the garden or orchard of the temple; round pits cut in the rock some 10 ft. deep have been discovered full of Nile mud with the stumps of palm or apricot trees still in them. The western colonnades are in ruins, but we can see that they each consisted of twenty-two pillars, arranged in double rows. The back row were sixteen-

sided and the front row seven-sided at the back and square in front.

The top of the stone ceiling of this colonnade formed the floor of the court above, the middle platform, which is at a level of 21 ft. higher up. It measures roughly 279 ft. by 250 ft. wide. On the west it is bounded by a double colonnade, each side consisting of eleven pairs of square pillars. Two steps at the north end of the colonnade descend to a hypostyle hall, in which are twelve sixteen-sided columns arranged in three rows, which support massive architraves and a flat stone ceiling. Three steps lead up to the shrine of Anubis, consisting of three small chambers, with elliptical vaulted ceilings. On the north side of the court is a colonnade of fifteen sixteen-sided columns, and in the wall behind are four small vaulted chambers. The south side of this middle platform is supported by a retaining wall ornamented with wide, flat pilasters, surmounted by alternating hawks and urasi of colossal size.

To the south-west of this court, and at the same level, is the little shrine dedicated to Hathor, goddess of the dead. It has since been found that this was reached only from below, by a flight of steps, of which a few traces still remain. The innermost chambers are hewn out of the rock, and are preceded by two covered vestibules, which are now in ruins. The first had sixteen-sided columns and four square pillars with semi-circular attached shafts, terminating in Hathor-headed capitals, the remains of which are now lying shattered on the ground. The second vestibule, at a slightly higher level, has four central columns with round shafts and sixteen sided columns on either side. The shrine proper is raised two steps, and consists of three chambers, each with several niches surrounding it.

Here we find conformity with the same law which prevails in hypethral temples, and which M. Perrot has named "the law of decreasing dimensions." Thus from portico to sanctuary the dimensions of the building decrease in every way and the floor itself rises. The innermost room contained the sacred emblem of the goddess, perhaps a golden cow, enclosed in a tabernacle or shrine. The sacred boat, which bore the tabernacle, was probably kept in the room immediately preceding. The various lateral niches were used, it is supposed, as store chambers, to serve for offerings, the divine vestments and all the sacred furniture.

We now ascend to the level of the upper platform, which is again 21 ft. higher up. The terrace in front of the central court had a row each of square pillars and sixteen-sided columns as remains show on the north side. A granite doorway leads to this central court, 83 ft. by 121 ft. wide, which it is now considered had a double row of columns around it. The ruins of the porch of the sanctuary of Ptolemaic date, and lead to a hall with semi-circular vaulted roof and two chambers beyond; the westernmost chamber is a restoration by Euergetes II., in which the reliefs and inscriptions compare very unfavourably with the masterly sculptures of Queen Hatshepsut. The western wall of this central court is built against the steep cliff of the mountain and pierced with a series of niches. In the northern wall is a doorway leading to a vestibule which had three sixteen-sided columns in it. Opposite the door is a small niche, the upper part and ceiling of which had been displaced by falls from the cliffs above, and which I have rebuilt. To the west of the vestibule is an open court in which is found the only altar that has come down to us from Egyptian antiquity. A door in the north wall of this court admits to the funerary chapel of Thothmes I., consisting of two chambers built into the cliff. The Hall of Amon, to the west, is approached only from the upper court, and part of its flat ceiling still remains in position.

On the south side of the central court are several chambers, now in ruins, and a well-preserved sacrificial hall with a portion of the semicircular vaulted roof still standing. This part of the temple was not completely cleared until the season after I left, and I am unable to describe it completely.

All the excavations in Egypt are regulated by the Governmental Department of Antiquities. The permit granted to M. Naville on behalf of the Egypt Exploration Fund, I believe, stipulated that the Society should undertake to completely uncover the whole temple, and also do any building work that might be neces-



sary for maintaining or re-erecting the old walls.

This is not the usual method in which private excavations are carried on in Egypt. A series of trenches is often all that is required to explore an ancient site and discover all the antiquities that may be buried upon it. But in our case it was necessary to remove the rubbish and dust, accumulations of centuries, to a considerable distance from the temple; and it was also found that when the support of the surrounding earth was taken away from some of the walls that they required strengthening.

Owing to the kindness of M. de Morgan, then Director of the Department of Antiquities, we had all facilities granted us for carrying on the work; and he placed at M. Naville's disposal a quantity of Decauville trucks, and quite half a mile of tram lines, with all the necessary curves and points for making a complete railway.

The general view of the temple taken before our excavations will show that the mounds rise considerably towards the west; it was, therefore necessary to arrange a system of tram lines on three different levels, each of them having only a slight gradient, and some 20 ft. above one another. The rubbish was taken in trucks from the highest mounds and tipped on to the next level; from thence it was loaded up again, and tipped down to a lower level, where another system of trucks carried it some quarter of a mile away from the temple to a natural hollow called by the Arabs "birket," or lake. During the two seasons that I was in Thebes a matter of 60,000 cubic metres of rubbish and stones were thus carried away from the temple, a feat that would have been impossible without the aid of a tramway.

This arrangement, necessitating the loading up of our trucks three times over, was criticised by some of the visitors that came to the temple, but I do not see how it could have been much improved upon. A steeper gradient would have been dangerous with such workmen as we had to deal with, who, in spite of all warnings, would push their trucks too fast, and thus run them off the rails, damaging themselves and our rolling stock at the same time.

Here, at Deir-el-Bahari, the diggers, drawn from Theban villages, have many of them been tomb-robbing from their infancy, and consequently have but few eyes for small antiquities. The actual digging is done by men with an implement like a short hoe or adze, called a "tooriye," with which they scoop the dust and rubbish into their palm-leaf baskets. Boys then carry these baskets to the trucks, which are drawn up close by, and bring them back to be filled again. Three or four men were in charge of each truck and pointsmen were stationed at various places. These latter posts were a good deal sought after, as the man in charge had only to push or pull the rail with a hooked stick. He could thus pass his whole day seated and smoking. We employed on an average 250 men and boys a day, with eight reises or overseers, one head reis to manage the railway—a clever Pyramid Arab, and a Coptic scribe who entered the names each morning and kept the accounts. The wages were, for a day lasting from sunrise to sunset, boys, 1½ piastres (3½d.) per day; men, 2 piastres (5d.), and 3 piastres (7½d.) for the reises. Occasionally the order was given to search each man before he left the works, as a preventive against their stealing small antiquities, but we did not succeed in finding anything concealed upon them.

Another general view of the temple, taken after our excavations in 1895, shows the magnitude of the work and the degree of success that has been attained.

It may be interesting to note here that the great tomb cave in which the celebrated find of royal mummies was made is always spoken of as being at Deir-el-Bahari, but it is nearly half-a-mile to the south, between the hills of Sheikh Abd-el-Gournah and the cliffs of the Libyan mountains. In the XXIIst dynasty, during a time of political trouble, it was resolved to protect the royal mummies from the chance of robbery by interring them altogether in this tomb cave. Corpses of the ruling dynasty were also placed here and all left in peace until 1875 when some Arabs discovered the well-hidden resting-place. The fellowen kept their secret until 1881 when they were traced, and Brugsch Bey had all the mummies conveyed to Gizeh. A few yards north of the

lower court is a square well-shaft forming the entrance to the common tomb of Theban priests of the XVIIIth, to XXth. Dynasties, which yielded a rich treasure to the Gizeh Museum in 1891.

During our first season M. Naville and myself lived in an Arab house in the village of Gournah, a good mile from the temple. This was found to be very inconvenient, and as the work was estimated to take several years for its accomplishment, the Egypt Exploration Fund decided to build a house quite close to the temple, which should be the headquarters of the staff. I accordingly designed a building which had a central courtyard with a dining-room overlooking the temple, five bedrooms, two storerooms, kitchen, and bathroom arranged around it. The foundations were of rubble stone laid in Nile mud mortar, the walls of mud brick, some of them being brought from the monastic buildings that we had to pull down to clear the temple. These in their turn had been pilfered from a XXVII dynasty building some 500 yards away. We found a few of them bearing the name-stamp of an officer of the XXVth dynasty, known from an inscription at Karnak as "the fourth prophet of Amon, the Prince of Thebes, the Governor of the South, Mentuemhat. The bricks measured 12 in. by 6 in. by 4½ in. thick, and probably only one in every hundred or thousand was stamped. The roofs were flat and ceiled with rafters and boarding on which was laid a layer of mud bricks on chopped straw, and the whole plastered over with mud mortar. The walls were roughly plastered inside with a mixture of lime, sand, and chopped straw, the lime having been burned in a native kiln, which I had made close by. The floors were of ancient red brick, floated over and set with a mixture of powdered burnt brick and lime. The joinery, with a few exceptions, was entirely of native make, the doors and windows being hung on wooden pivots, the former being fastened with beechwood locks and keys. As the house has been used every season since it was built in 1893 by members of the staff of the Egypt Exploration Fund, it has well justified its existence. The great work of copying all the reliefs which cover the temple walls is not yet finally completed, and Mr. Carter, the artist, has already taken up his abode at Deir-el-Bahari for another season's work.

In considering some of the details of the temple, we may begin with the lower terrace, on a part of which are a few stones depicting the transportation of two great granite obelisks. Various fragments belonging to this most interesting scene have been discovered in the Coptic buildings which had to be removed, and it is now possible to piece them together sufficiently to show that the obelisks were placed on a great, boat-like barge. This was towed by thirty large rowing-boats, arranged three abreast and in lines of ten. There were thirty-two oarsmen in each boat, so that, adding officers and steersmen, the crew which towed these obelisks from Assuan to Thebes numbered quite 1,000 men.

A diagram showing a partial restoration of this scene, drawn by Mme. Naville, appeared in the *Archæological Report of the Fund in 1895-1896*.

Whether these obelisks were destined for Karnak, this temple, or elsewhere I cannot say. One of Hatshepsut's obelisks at Karnak is still standing; it weighs about 300 tons, and the inscriptions mention that these two monoliths were quarried and erected complete in seven months. Professor Petrie believes the pair at Deir-el-Bahari to have been put up by Thothmes III., and identifies the top of one of them at Constantinople. He calculates the weight of each obelisk at the enormous figure of 800 tons.

We now ascend to the middle platform and examine first the sculptures on the southern half of the terrace. The twenty-two square pillars which supported the ceiling are of a slightly tapering form with delicately-rounded aristas. The scenes on the walls commemorate an expedition to the Land of Punt, which is supposed to lie on the west coast of the Red Sea, corresponding with the modern Somali coast. Incense, panther skins, ivory and ebony were among its chief exports to Egypt. A village in Punt is shown, the houses of which are built on piles over water, amongst palms and incense trees, and ladders lead up to the doorways. We see the Egyptian fleet setting sail, and above, its arrival in Punt. Farther on the Queen, followed by her guardian spirit, dedicates to Amon the spoils of the expedition.

Cattle are shown feeding beneath delightfully conventional trees (see illustration). Gold and incense is weighed and incense is measured in the presence of the gods.

On the corresponding northern half of the same terrace, the scenes refer to the birth of the Queen, but unfortunately in every case the figure of Hatshepsut has been defaced, though that of her mother Aahmes has been respected. Her admirable portrait is probably the finest piece of work remaining in the whole temple. Though, like all the sculpture, it is in very low relief, the admirable modelling of the delicate and refined features, and the smiling expression, give to the face a beauty which bears witness to the skill of the Egyptian artist, and makes one regret that so little has been left of the original work.

A great feature in this temple are the so-called Proto-Doric columns. Those in the Hypostyle Hall are sixteen-sided, measuring 2 ft. 7 in. in diameter just above their shallow circular bases, and they are 15 ft. 9 in. in height, tapering to an upper diameter of 2 ft. 4 in. The abacus is square and flush with the shaft, and a simple band of hieroglyphics appears on one face. Proto-types of this form are to be found in the rock-cut tombs of Beni Hasan, which differ only in having fifteen of their sides fluted like a Greek-Doric column, and one left flat to receive the dedication inscription.

This Hypostyle Hall, which forms a vestibule to the Shrine of Anubis, is in a very perfect state; the flat stone ceiling, resting on massive architraves, and the supporting columns, are all intact. The ceiling is painted blue and powdered with yellow stars. The spacing of the columns is wider in the centre, so as to form a better approach to the chambers beyond.

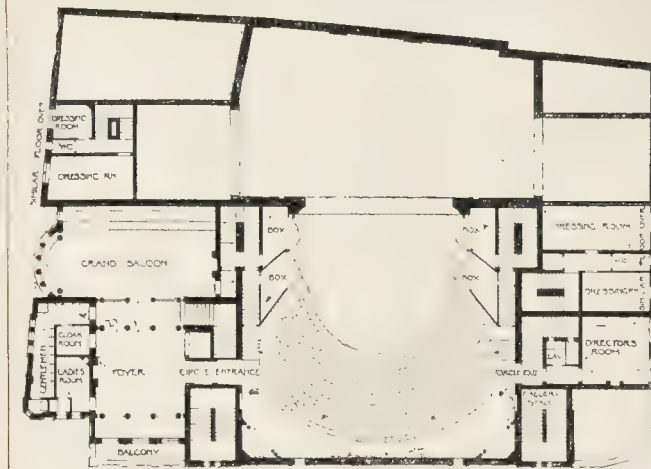
The granite doorway leading to the central court is one of the most striking features of the *upper platform*. It is especially interesting in that it shows clearly the erasures around the cartouches which bore the Queen's names, "Ma-ka-ra, Hatshepsut," but which now read "Ra-men-Kheper, Tehutimes," the names of Thothmes III. Where these alterations occur one can see plainly that the surface of the granite has been rubbed down to admit of new signs being inscribed. But, irrespective of erasures, Egyptologists are able to prove that the Queen's cartouches must have been there by the fact that the surrounding inscriptions are in the *feminine* gender. That great doors were once hung here is shown by the pivot and bolt holes on the inside.

A somewhat similar granite portal on the further side of the central court leads to the Sanctuary, a narrow hall with a semi-circular stone roof. These curved vaults occur in several parts of the building, and are not true arches, but built with horizontal joints, forming really a series of corbels curved on the inside. Nevertheless, it appears quite certain that the Egyptians understood the principle of the arch, and used it in brick buildings. The so-called granaries of Rameses, behind the Ramesseum, are notable instances of arched constructions of the nineteenth dynasty; but last season Professor Petrie unearthed a mastaba, or built tomb, at Denderah, with three ring brick arching to it, which belonged to a prince named Adu, who lived under Pepy II. of the sixth dynasty—at least 4,000 and perhaps 5,000 years ago!

The great stone altar which stands in the middle of the Altar Court, is one of our most interesting finds. It is a rectangular structure of fine white limestone, measuring about 16 ft. by 13 ft. At the western end is a flight of ten steps leading to its upper surface, 5 ft. 2 in. above the floor. It is crowned with the usual bold cornice so common in Egyptian architecture, consisting of a large bead and cavetto moulding, and a similar bead to that on the cornice is worked on each angle of the altar mitring with the cornice bead. The proportions of the steps leading up to the altar are worth mentioning, having a rise of 6½ in. and a tread of 19½ in.; but the treads are not level being "kilted," or inclined as much as 1½ in. The height of each riser is thus only 4½ in. The Altar Court was evidently always open to the air, and its walls are consequently unincised and quite plain. They are built to a batter, as are most walls in the temple, and were finished with an overhanging cornice. I carried out some considerable repairs here, consisting of rebuilding portions of the walls and altar, and forming rough retaining walls against the loose and friable cliffs on the north.

(Continued on page 409.)





The Crown Theatre, Peckham. Plan.

### Illustrations.

#### THE CROWN THEATRE, PECKHAM.

WE give a view of this theatre, which has just been completed from the designs of Mr. E. A. Runtz.

The accompanying plan explains the general arrangement of the house, which has its auditorium and stage rather curiously placed on a central axis at right angles to the longest side of the site. This was apparently due to the client's wish for an unusually broad stage; and though this is not in a general sense the best way of placing a theatre on the site, in this instance it has had some advantages, a somewhat more picturesque grouping being obtained than would otherwise have been the case. The block is distinctly divided into two parts, one containing the auditorium and stage, and the other the offices, and the architect has contrived to express the purpose of the interior on his façades in a manner which greatly enhances the general appearance of the building.

The exterior is designed in what may be defined as the Spanish Renaissance style, the material being red brick, with terra-cotta of a somewhat lighter tint. The section of the building containing the auditorium is simplicity itself, and its large, plain surfaces are exceedingly effective. The portion of the building which comprises the main entrance, foyers and saloons, is marked by greater elaboration in detail, and is almost entirely in terra-cotta.

The main entrance to the stalls and upper tier leads first into a vestibule, planned so that the way to the different parts of the auditorium can be easily recognised, whilst the saloon is within easy reach, and the box-office well placed in connexion with some managerial rooms. From the vestibule a few steps lead down to the stalls, the staircase taking the visitor to the first tier. The necessary extra exits are symmetrically placed on either side of the auditorium. Not only has the pit its own entrance, but also the second tier, which serves as an amphitheatre and gallery. For the stalls, first tier, pit and second tier, there are symmetrically placed extra exits.

On the same level as the main entrance there is a special saloon for the stalls, which is the most successfully decorated room in the building. The architect has avoided the garishness generally associated with the ordinary theatre bar, and given it a Flemish character, utilising some old carving for paneling the whole of the outer walls to a height of some 7 ft. The bar fittings, furniture, floor, and windows are all in keeping with the period, and a great deal of care has been taken in the details of pottery, pewter-work, and even the hunting trophies which adorn the walls. This saloon is something unique in this class of building, the only other theatre we know of in which an attempt has been made to obtain a

similar effect being the "Flemish" theatre at Brussels.

The first tier is equipped not only with a saloon, but also with a foyer, treated in a modern phase of Italian Renaissance and containing a small fountain.

In respect to the auditorium, both seating and sighting are quite perfect, whilst the general breadth is very effective. There are two tiers, both of considerable depth, and supported by cantilevers at either end. The proscenium, which is surrounded by boxes, shows a plain marble framing. As far as the decoration is concerned, the detail and modelled work are good, but the colouring has certainly suffered from lack of experiments under the ordinary conditions of electrical illumination. In the ceiling, as well as in the upholstery, the effect is hard. This will either require some alteration, or may, perhaps, be toned down naturally in course of time.

The frieze over the proscenium, painted by Mr. Buchell, represents a personification of Britannia, with figures of England and Scotland, and others representing the various arts and sciences. Throughout the remainder of the decorations patriotic emblems have been introduced, the Crown being most in evidence; and a wall-paper in the auditorium, into which the design of a crown is worked, is particularly successful both in design and colouring.

In respect to the offices, there is little to say, excepting that they are thoroughly convenient and equipped in modern style throughout. The stage is notable for its extreme breadth of 140 ft., which will allow of many spectacular effects unobtainable elsewhere. In the construction the only point of interest is to be found in the cantilever work referred to. As regards minor installations, the electric lighting arrangements call for commendation as both economic and practical.

As already mentioned, Mr. Ernest Runtz is the architect. Messrs. Colls & Sons were the contractors, and among the many sub-contractors were Messrs. Dennett & Ingle, who had charge of the constructional ironwork; Messrs. Doulton & Co. for the terra-cotta; Messrs. Storde for the electric lighting; and Messrs. Jackson & Son for the modelled decoration.

Considering how generally in this country the designing of theatres has been carried out with mere regard to economy of time and money, and with such commonplace architectural treatment as hardly amounts to design in the true sense of the word, it is gratifying to be able to record and illustrate the erection of a theatre which really possesses original architectural character and is the work of an artist.

#### DESIGN FOR A COUNTRY HOUSE.

This sheet of elevations and plans, which was exhibited at the last Royal Academy, shows a design for a house by Mr. G. C. Horsley,

intended to be built in Hampshire. The walls are to be of local stone, and the roofs of stone slates.

We observe that there is no compass point, but it may be presumed that the front towards the terrace faces south or thereabouts, and the entrance north. The gallery between dining-room and drawing-room, with its three bays, is an effective feature in the plan, and rather an unusual one in a house on this scale.

#### ILLUSTRATIONS OF DEIR-EL-BAHARI.

THESE illustrations are reproduced, with the concurrence of the Egypt Exploration Fund, from some of their photographs and published plates, in order to form illustrations to Mr. Newberry's paper at the Architectural Association, reported in the present issue.

They comprise the general plan of the temple and its immediate surroundings; a view of the exterior of the shrine of Anubis with its proto-Doric columns; two similar columns from the colonnade on the north side, and the *temenos*, and a portion of the curious and highly decorative bas-reliefs of trees, on the wall at the back of the colonnade extending across the front of the temple.

#### DESIGN FOR A PIANOFORTE.

THIS piano shows a decorated treatment of a case which was designed for Messrs. Broadwood, and which has been reproduced by that firm under the name of the "Manxman." One of the particular advantages of this case is its adaptability for decorative treatment. In the design illustrated here the exterior of the piano is carried out in inlaid woods in a scheme of green tones with violet and white. Inside, the colour is in tones of yellow and orange, and the metal work gilded. The flowers are executed in ivory carved in low relief.

M. H. BAILLIE SCOTT.

#### DESIGN FOR STAINED GLASS.

THESE panels were designed to fill a window in an artist's studio, consisting of five lights. A rich scheme of colouring was adopted, as the window in question was rarely used as a source of light.

Though each panel is a separate composition in itself, the whole window has been taken into consideration in balancing the colour; thus a figure in a blue or green drapery is balanced in the next light by a figure in a warm coloured one; and in the case of the central figure a neutral tint was chosen to balance the warm and cool colour on each side.

The subjects of the panels are rather varied, and are as follows:—The first, starting from the left, represents "The Goddess of the Winds," or "Air," surrounded by birds; the second represents "Earth," with a background of apples; the third, the Goddess Flora, with roses; the fourth, Undine or "Water," with a background of fishes, seaweed, &c.; and the fifth is another treatment of the Goddess Flora.

LEONARD WALKER.

#### ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—On the 27th ult. a conversation of the Manchester Society of Architects was held in the City Art Gallery, Mosley-street. All the galleries were thrown open to the visitors, and, in addition, there was an exhibition of architectural drawings and of several exhibits from the recent arts and crafts collection. A large number of ladies and gentlemen accepted the invitations sent out, and they were formally received by Mr. R. J. Bennett, the President of the Society.

THE ELECTRIC LIGHT AT BARNESLEY.—Colonel W. Langton Coke, M.L.C., an Inspector of the Local Government Board, attended at the Town Hall, Barnsley, on the 28th ult., for the purpose of holding an inquiry into an application of the Barnsley Town Council to borrow 25,000l. for the purpose of the electric lighting of the town. The Borough Surveyor, Mr. J. H. Taylor, said the site of the proposed works adjoined the premises of the Highways and Waterworks Departments. He described in detail the several buildings required for the installation. About half the available site would be at present used, and future extensions would probably be carried across the Highways and Waterworks depot. The estimated cost of the buildings was 4,678l. Mr. Thos. L. Miller, Electrical Engineer for the Corporation, said it was proposed to lay down a plant of 6,000 eight-candle power lamps or their equivalents.



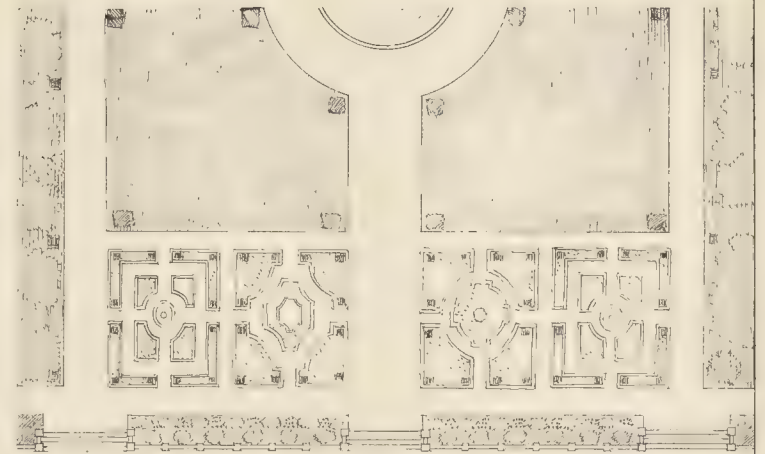
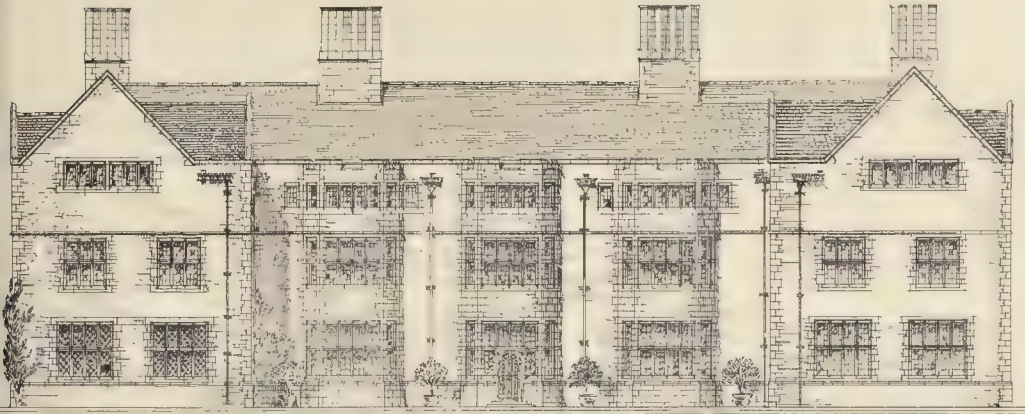


NO. 10, ST. MARK'S STREET, LONDON, E.C.

THE CROWN THEATRE, PECKHAM MR ERNEST RUNIZ, ARCHITECT







FLOOR PLAN

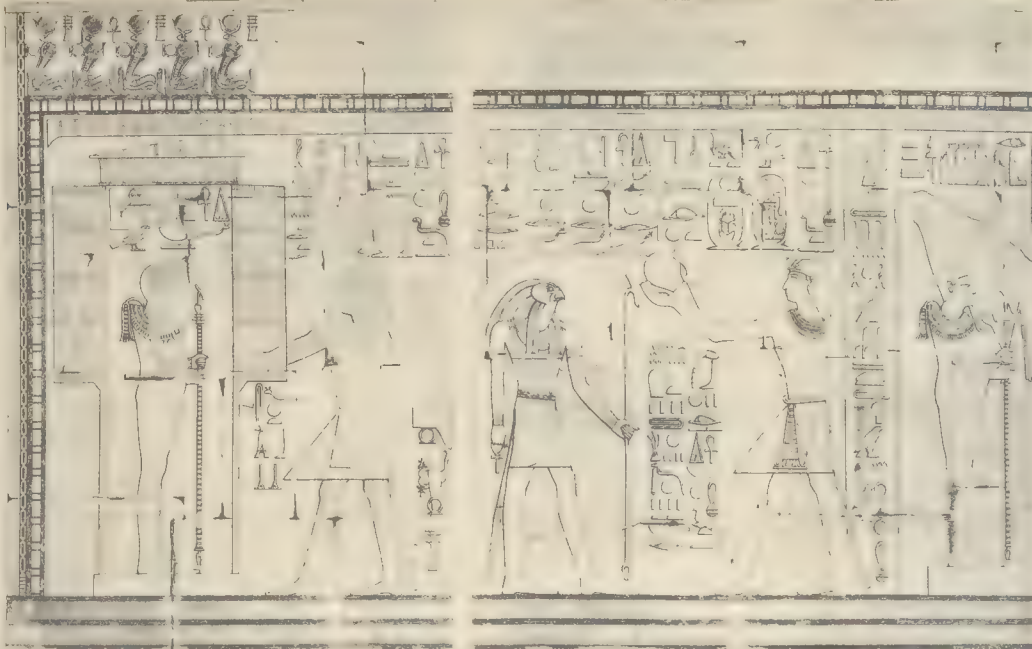


DESIGN FOR A COUNTRY HOUSE:  
Entrance & Garden Elevations & Plan:

Condit & Hensley, Architects





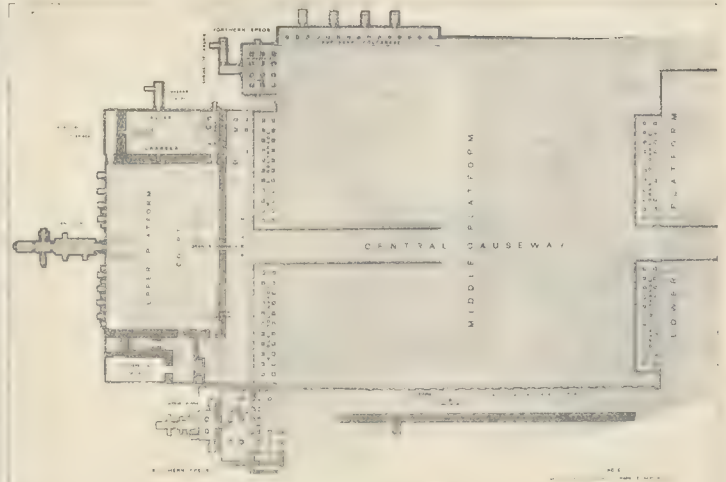


HATSHEPSU DRAWING OFF THE VEIL OF PHTAH.

RAMSES III OFFERING WATER TO OSIRIS.

OSIRIS.

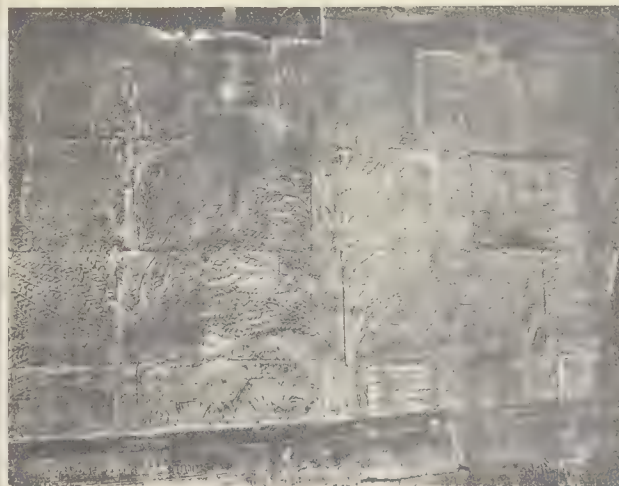
PAINTINGS IN THE SHRINE OF ANUBIS.



PLAN OF THE TEMPLE.



VIEW OF THE SHRINE OF ANUBIS.



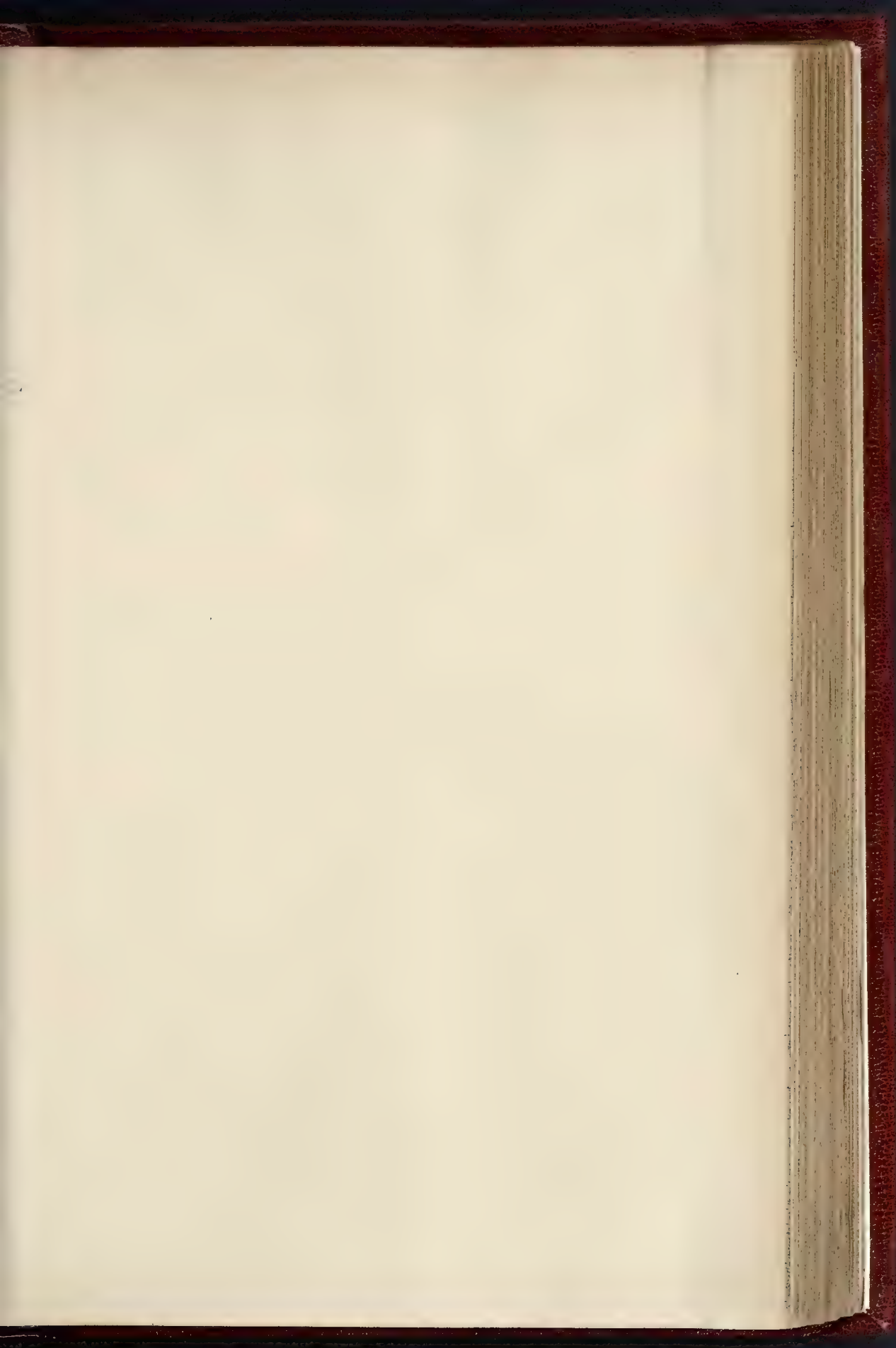
BASKILLIES OF TREES, SOUTHERN HALF OF MIDDLE COLONNADE.

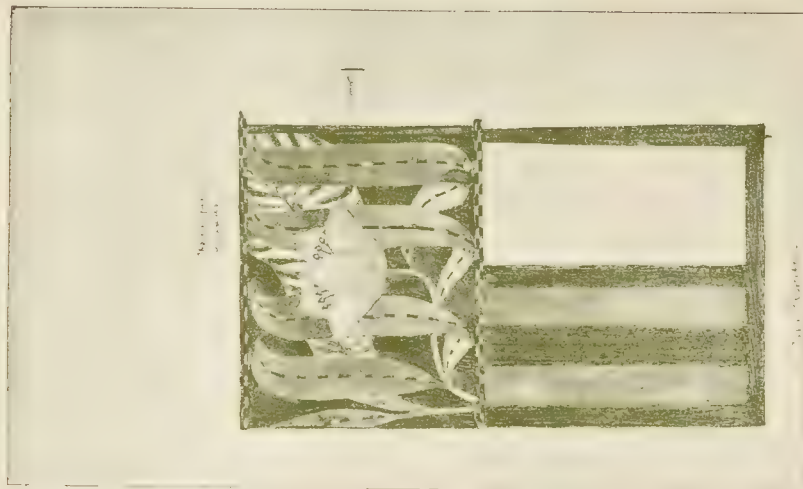
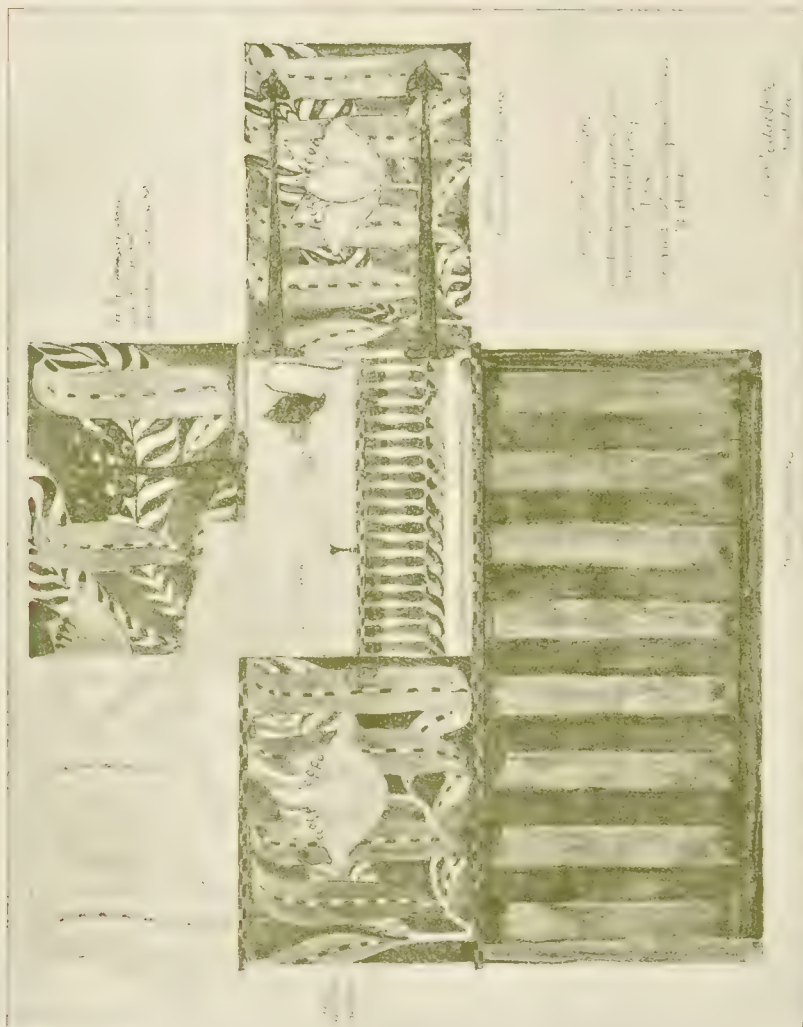


EAST OF NORTH COLONNADE.



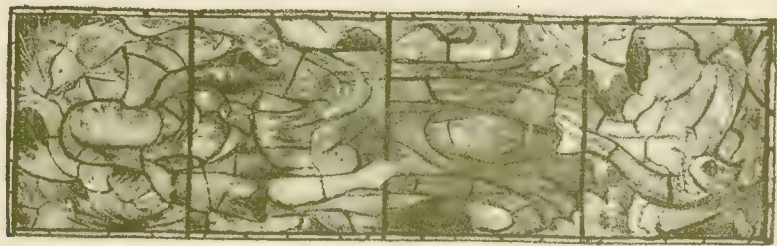
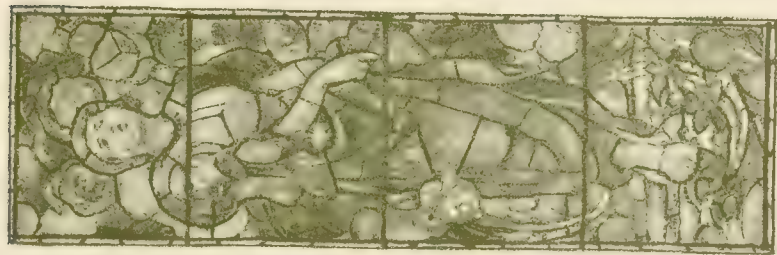
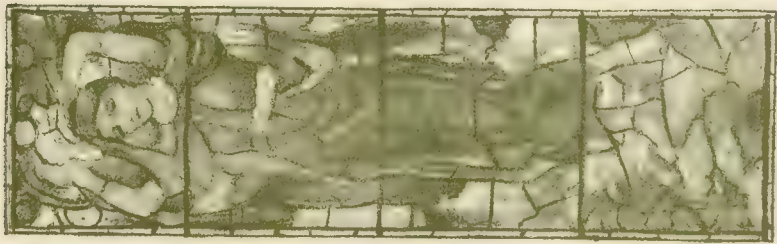
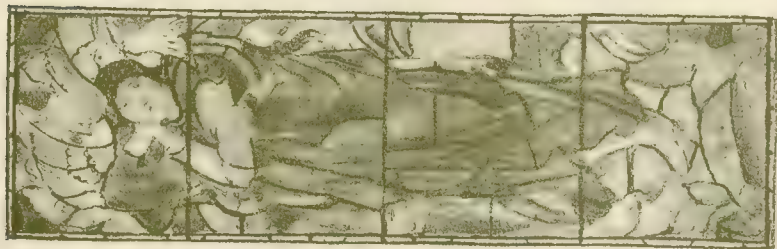






NO PHOTO, PRAGUE A. 1. 4. 5 EAST HARD NG CIRLEY FITTER ANF E.C.





DESIGN FOR STAINED GLASS—By MR. LEONARD WALKER

NEW YORK: SPENCER & CO. 445 FIFTH AVENUE STREET-ENTRANCE





## THE ARCHITECTURAL ASSOCIATION.

(Continued from page 407.)

In the middle of the north wall of the Altar Court is the doorway leading to the Funerary Chapel of Thothmes I., a chamber at right angles to the court and measuring 17 ft. 3 in. by 5 ft. 2 in. wide, and roofed with a curved ceiling of elliptical form with horizontal joints. At the north end is a stone seat, and above it is a much mutilated scene. It represented on the left a shrine, in which stood the symbol of the god Anubis, a skin on a pole. Before the shrine stood the Queen, now completely defaced, and behind her Thothmes I., her father, whose cartouche reads "Aa-keper-ka-ra." In the upper part of the scene were two jackals, also emblems of Anubis, each *couchant* on a shrine. In the centre is the cartouche of the Queen, "Ra-ma-ka," or "Ma-ka-ra," as it is now read. At the north end of the chapel and on the western side is a niche for the reception of offerings.

In the passage between the southern enclosure wall and the retaining wall of the middle platform, not far from the Hathor shrine, an inclined plane cut in the rock was discovered, leading to the entrance of a large tomb. The rubbish was here quite untouched, and when the doorway was cleared disclosed a large shaft, well cut in the rock, and opening into a larger chamber. In the middle was a square space for a stone sarcophagus, but, instead of the surroundings of an important burial, there was only a poor wooden coffin with bones in it, which seemed to have been disturbed. No inscription or ornament of any kind were to be seen except a few hieratic signs. M. Naville thinks it probable that this tomb was prepared by Hatshepsut for herself, but was never used owing to the hatred of her nephew, Thothmes III.

In this same passage a large foundation deposit was discovered in a rock-cut pit, about 3 ft. deep. It was covered with mats, under which lay first a few pots of common earthenware, then about fifty wooden objects, models of an implement which, for the want of a better name, have been called winnowers. M. Naville says that they may be sledges used for threshing corn. Each bears the cartouche of the Queen. Lower down were fifty wooden hoes, four bronze plaques, a hatchet, a knife, eight wooden models of adzes, and eight larger adzes with bronze blades; at the bottom were ten little pots of alabaster and ten baskets, stands for the pots. All these objects were, as usual, buried in fine sand.

In every Egyptian temple the sanctuary contained a shrine or naos, in which were hidden the emblems of the god to whom the temple was dedicated. They were generally made of wood, so that they could be moved and either placed on sacred boats, or carried by means of staves, as was the ark of the Israelites.

All the wooden shrines have perished, except a very small one, but a foot high, which is now in the Turin Museum. During our first season we found one side of a large ebony shrine, the panel measuring 5 ft. 7 in. high, 3 ft. 7 in. wide, and 1 in. thick; also one leaf of the doors of the shrine, which is 2 ft. 5 in. high, 12½ in. wide, and ½ in. thick.

On the inside of the shrine one can see the mortices and part of the adjoining panels. As ebony can only be obtained in small sizes, the whole is pieced together of little bits, and held by pegs of the same wood. The angles or styles are cut out of solid pieces, 2½ in. square, to which are fastened the top and two middle rails of the same width as the angles, but only 1 in. thick, thus dividing the whole into three panels. The bas-reliefs represent Thothmes II. making offerings to Amon-Ra, the emblems being probably owing to Akhenaten. Underneath are a series of magical signs, arranged in pairs, and the symbols of stability and duration. At the bottom is a range of the so-called false or "Ka" doors.

Externally the panel is divided into six divisions, two of the rails being only thin pieces of ebony pegged on, forming what we should term a sham. Rows of the same emblems are arranged in the panels, and the styles or rails are beautifully carved with dedicatory inscriptions of Thothmes II., part of which reads: "He made a sacred shrine of great value of ebony of the mountaineers (of Nubia)." On each of the horizontal lines it is stated that Thothmes is a worshipper of Amon-Ra, who dwells in "Serui," the ancient name of the temple.

The small leaf of the double door is also made of irregular-shaped pieces of ebony,

dowelled together, and having eleven small ledges pegged on to one side, each of them about ½ in. by ½ in. and rounded on the back. The pivot side of the door is also rounded and the bolt side rebated for the other leaf. Four bronze staples for the bolts are still in position.

A description of this temple, however slight, would be incomplete without a reference to its celebrated architect, Sennut. It seems that though Hatshepsut, like Queen Elizabeth, was not beloved of her relations, yet she had the same power of drawing to herself great men. Of such a man, Sennut, the architect of her temple, we have many records. To quote the *Edinburgh Review*, "The many sidedness of Michelangelo was nothing compared to that of Sennut—the queen's architect—who himself superintended the quarrying and carving of the queen's obelisks, was tutor to the queen's daughter Neferura; he was keeper of the temple of Amon; keeper of the granaries of Amon; royal seal-bearer; keeper of the palace; keeper of the heart of the queen (to which title Petrie compares the king's conscience or Lord Chancellor); priest of Aahmes; keeper of the queen's cattle." Besides his great work at Deir-el-Bahari, he directed the erection of Hatshepsut's two granite obelisks at Karnak and superintended architectural work at the temples of Karnak, Mut, Luxor, and Erment. A kneeling statue of him was discovered by Miss Benson in 1866 at her excavations at the temple of Mut. The inscription states that it was "presented by favour of the queen," and some further interesting particulars of his life will shortly appear in her book on this temple.

My brother had the good fortune to discover his tomb high up on the north-east of the Gournah hills. It had been very magnificent, but the painted facing of the walls is now almost entirely destroyed.

A clear white glass bead, inscribed Sennut, was found at Deir-el-Bahari, as well as a fragment of a statue of him. My brother has a carefully-worked piece of black marble inscribed with his name, which appears to have been a paint muller, and may have been used by him for mixing up his Indian ink.

It is recorded that he was a man of the people, for "his ancestors were not found in writing," and his portrait-statue gives no very high-bred features, but an ugly, capable, complacent face.

In conclusion, I must acknowledge my indebtedness to the various publications of the Egypt Exploration Fund, by M. Naville, which I would refer you to for further information on this interesting and beautiful temple; also to Professor Flinders Petrie's "History of Egypt," and Professor Steindorff's edition of Baedeker's "Guide to Egypt," 1898.

The Chairman said they must all feel indebted to Mr. Newberry for a lecture which was particularly interesting at the present time. The lantern views and the lecturer's descriptions brought the places very vividly before them. The photographs were excellent, and in looking at the views one could almost feel the hot sun which they knew bore down upon the ruins. It was very interesting to an architect to study among such ruins, but one could not help feeling some regret that there was still a possibility of the debris from the cliffs accumulating so that the work of the ancient builders would be destroyed and the labour of the present excavators wasted. It was a matter for satisfaction that the work of those men was being discovered, and to know that the remains of their work was handing down the history of the periods in which they lived. Even in those days the architect, judging from Mr. Newberry's description, was a man appreciated by those in power; his work was appreciated for the sake of the work, and he passed on to future times memorials such as few countries had equalled in massiveness and strength of construction.

Mr. R. Phené Spiers, in proposing a vote of thanks to the lecturer, said he had been looking forward with considerable interest to the lecture, because no less than thirty-two years had passed since he stood on the plains of Thebes, and he was curious to see how far his recollection would take him, and whether he would be able to recognise the objects Mr. Newberry had put before them. The excavations which had been made at the Temple at Deir-el-Bahari, in clearing away all the rubbish that had accumulated, had exposed to view the whole disposition of the building, and there was no doubt that they owed a great debt of

gratitude to the Egypt Exploration Fund, to M. Naville, and to Mr. Newberry (who had measured the work), for the preservation of the remains. There was one point, however, where he should have to traverse the statement of Mr. Newberry. He (the speaker) had not the slightest doubt that since he visited the place in 1866 earth and sand had blown over a great portion of the work, so that when excavations were made at the time Mr. Newberry referred to (in 1893), there were a series of mounds covering the work that he had seen in 1866. It was only in that way that he was able to explain the matter, for it was all very well to say that the temple was buried 30 or 40 ft., but he had plans which showed that he saw it thirty years ago. Mr. Newberry had referred to the earlier descriptions as given in the account of the French expedition of 1798, and later on in the works of Wilkinson, Lepsius, and Mariette, the latter of whom undertook important excavations in 1858, and published a monograph on the temple. That monograph was not published until 1877. Mr. Newberry had also said: "But it was reserved for the Egypt Exploration Fund, under the able guidance of M. Naville, to bring to light one of the most interesting temples of Egypt, of which up to 1893, two-thirds were covered by mounds of rubbish that reached to a height of 40 ft. in places." Well, he (the speaker) saw through that 40 ft., as did his friend, Professor Brune. In proof of that statement he was able to exhibit that evening plans made at the time of his visit. Mr. Newberry had evidently not read Mariette's work; had he done so, he would have seen but a slight mention of the name of the discoverer of the Temple; and had he looked at Perrot and Chipiez's work, he would have noted that the name of the man who really discovered the Temple was Emmanuel Brune, a Grand Prix man, who measured, with some slight assistance from himself, the whole of the Temple, and made some astonishing drawings for the Institut de France in 1867. When Mariette saw those plans, he asked the author to lend them to him, and subsequently published them, forgetting, however, to acknowledge his indebtedness to Brune. Mariette, not being an architect, did not claim the restoration of the Temple, and he was obliged to give Brune the credit of that. That was not the only action of Mariette to which he took exception.

Professor Brune also lent Mariette the plans of Karnak, who published them in 1878, without Brune's name attached. As to M. Naville, of course, he had been able to make a few discoveries of his own, and the chief credit in the matter pertaining to him was his discovery of the bas-reliefs, which, owing to his Egyptian knowledge, he had been able to read. As regarded the general plan, he would read an extract from Perrot and Chipiez's "History of Art in Ancient Egypt." The authors said: "We must refer those who wish to study the remains of this temple in detail to the work devoted to it by M. Mariette. The plan which forms plate 1 in the said work was drawn in 1866 by an architect, M. Brune, who is now a professor at the Ecole des Beaux-Arts. M. Brune succeeded, by intelligent and conscientious examination of all the remains, in obtaining the materials for a restoration which gave us for the first time some idea of what this interesting monument must have been in the great days of Egypt. Plate 2 contains a restored plan; plate 3 a view in perspective of the three highest terraces out of the hill which forms their support. We have attempted to give an idea of the building as a whole. Our view is taken from a more distant point than that of M. Brune, but, except in some of the less important details, it does not greatly differ from his." He could not help thinking that it seemed a little unfair, therefore, for M. Naville to say in the preface of his book on "Deir-el-Bahari" that "little was known before the excavations of 1893, for not even Mariette had made any attempt to explore this part of the ruins, and in the conjectural restoration made for him by M. Brune the northern half of the upper platform is represented as symmetrical with the southern." As he had previously stated, the "conjectural restoration" was made by Brune for the Institut de France and not for Mariette. Professor Brune, who was dead, was one of the most remarkable men of his time, and he (the speaker) felt bound, as his friend and companion, to take up his case, the more so as M. Naville remarked to him (the speaker) on the only occasion they had ever met that Professor Brune did not discover anything at all. Mr.



Newberry had referred to the small wages paid to the labourers at Deir-el-Bahari. Mr. Somers Clarke, who had spent some time in Egypt and had built a house there, paid for sunburnt bricks of the same dimensions as those mentioned by Mr. Newberry, viz.: 12 in. by 6 in. by 4½ in.—7d. per thousand. The house cost Mr. Somers Clarke something like 17l. or 18l., and had two vaulted halls—one barrel vaulted and the other with a dome. The barrel vault was built in the same way as in the granaries of Rameses, and the dome was constructed without centering. They must all be much obliged to Mr. Newberry for his valuable lecture and for the illustrations which he had shown them that evening.

Mr. Alex. Payne, in seconding the vote of thanks, said he was at the Temple of Deir-el-Bahari last year, and from the early views shown that evening he was able to appreciate how impossible it had been to form a clear idea of the Temple until the works which Mr. Newberry had referred to had been carried out. There was nothing in Rome or Athens to compare with the extensive remains at ancient Thebes, and he would recommend all who could possibly do so to visit the place. The Temple of Deir-el-Bahari was different from other temples to be seen in Egypt; in most temples in Egypt there were two or three large halls: there was a large court in front, to which the people were admitted, a second court to which princes and important people were admitted, and then the cella, where the statue was kept, with other rooms for service around; but at Deir-el-Bahari there was a different arrangement. He was not sure whether it should be regarded as a temple at all, for it was a sort of cemetery, or mortuary, building. Most of the religious buildings on the west bank of the river at Thebes were mortuary temples built in honour of the ancestors of the Pharaohs who erected them.

Mr. C. H. Brodie asked the lecturer where the great quantity of rubbish came from? Was it principally sand, which had been blown over the temple? It was remarkable that the architect was so much appreciated in those days. He had read somewhere that an architect was the only person not of royal blood who was permitted, in those days, to marry a princess. Could Mr. Newberry verify that statement?

Mr. Alex. Wood asked the lecturer whether he knew how the buildings at Thebes compared constructively with those at Memphis? He was reading some time since that there was a difference in the workmanship to the disadvantage of the buildings at Thebes.

The Chairman, in putting the vote of thanks, said the remarks made by Mr. Spiers had been extremely interesting; it was important in the interests of truth to know who was the real discoverer of the Temple.

The vote of thanks having been agreed to, Mr. Newberry, in reply, said that in regard to the accumulation of material from the falling cliffs, the "gafirs," or native custodians of the ancient monuments, appointed by the Egyptian Government, would clear away the debris as it fell. Mr. Spiers' remarks were extremely interesting; but he (the speaker) had purposely not dealt with the restoration, but only with actual facts relating to the Temple. He was sorry that Mr. Spiers appeared to think that M. Naville claimed to be the discoverer of the Temple. He did not think that M. Naville could have made such a claim, because when he (the speaker) first went to Deir-el-Bahari, the greater part of the architectural details of the southern side of the Temple were already exposed to view, and the Hypostyle Hall was accessible, though one could only just creep in between the architrave and the rubbish. Brune's restoration was extremely interesting, and was mentioned by M. Naville in his Introductory Memoir on the Temple, in which Mariette's plan was also published. The latter was wonderful as far as it went, though it was not quite accurate. For instance, in the middle colonnade, Mariette, or rather Brune, showed twenty columns on either side, whereas there were really twenty-two.

Mr. Spiers: There are twenty-two in the original sketch and in Brune's restoration. A mistake has been made in copying from the original plan.

Mr. Newberry, continuing, said that Mr. Spiers' remarks about the construction and price of Mr. Somers Clarke's house were very interesting. It was surprising that Mr. Clarke was able to get his house built for so small a sum. The house he had referred to in his paper had

cost nearly 100l., but then it was much larger and some of the extra cost of that was due to the fact that the site was about three miles from the Nile, and all the water they wanted had to be conveyed on donkey back; they had also to burn their lime on the spot. He agreed with Mr. Payne, that the monuments on the west bank of the Nile were almost entirely of a funerary character. To return to the rubbish question, a great deal of what had to be cleared away consisted of the debris left by the original builders, as well as the rubbish which Mariette had moved from the south to the north side of the Temple. No doubt large quantities had also fallen from the friable cliffs. The almost tropical sun heated the limestone rocks to such a pitch during the day that the sudden chill at sunset sometimes caused pieces to fall off with the noise of an explosion. As to Mr. Wood's question, there were no temples left in the earlier capital of Memphis, but there was no doubt that the earliest work was also the most artistic. The nearest to life of any statue that had come down to us from Egyptian antiquity was the celebrated "Sheikh el Beled"—a wooden statue—of the Vth dynasty from Sakkarah—now preserved in the Gizeh Museum, and of which there was a cast in the British Museum.

On the motion of the Chairman a vote of thanks was accorded to the Palestine Exploration Fund for the loan of diagrams.

The Chairman announced that the next meeting would be held on November 11, when Mr. H. Wilson would read a paper on "Arts and Crafts."

The meeting then terminated.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Newington Vestry 10,000l. for electric lighting purposes; the Shoreditch Vestry 10,470l. for the same purpose; the Wandsworth Burial Board 3,000l. for the extension of Wandsworth Cemetery; the Whitechapel Guardians 29,000l. for the purchase of land and buildings adjoining the infirmary; and the London School Board 150,000l. for new schools.

**The Water Question.**—The whole of the sitting was occupied in the discussion of the following proposals of the Water Committee:—

1. That a Bill be promoted in the coming Session of Parliament for the purchase, by the Council, of the undertakings of the eight metropolitan water companies, by agreement, or failing agreement, by compulsion.

2. That, subject to such provision as may be made by Parliament as to the ultimate Authority or Authorities, provision be made for the undertakings of the companies vesting in the Council at a date not later than six months after the passing of the Act.

3. That the Bill contain provisions authorising the Council to proceed forthwith with the connecting and laying of mains and other works necessary in order to enable it to protect any part of the metropolis from want of water.

4. That the arbitration clause be so framed as to render it certain that in the case of each company the arbitrator will have regard to all such circumstances as may be brought before him, and that no allowance shall be made in respect of compulsory sale except for cost of reinvestment (if any).

5. That, subject to further negotiation thereon with the Local Authorities, the clauses with respect to the supply of outside areas should follow the principle of the bills promoted by the Council in 1895.

6. That the understanding with the Corporation of the City of London, with regard to their representation on the Water Committee, be adhered to if they so desire.

7. That a Bill (or Bills) be promoted in the coming session of Parliament for the purpose of empowering the Council to bring an additional supply of water to London from the watersheds of the Wye and Toway on the general lines of the report of the Water Committee approved by the Council, April 21, 1896, in so far as it applies to the Wye section of the Engineer's scheme.

8. That it be referred to the Parliamentary Committee to prepare and present to the Council the necessary Bills for carrying out the above resolutions.

The recommendations were all agreed to, most of the proposals being supported by both parties in the Council.

**Abbey Mills and Isle of Dogs Pumping Stations: Repainting.**—The Main Drainage Committee recommended, and it was agreed—(a) That the tender of Mr. Arthur H. Inns, amounting to 2,154l. 9s. 4d., for the repainting of the Abbey Mills and Isle of Dogs pumping stations, be accepted; that the solicitor be instructed to prepare the contract; and that the seal of the Council be affixed to the contract, when ready. (b) That Mr. J. Berry be employed as clerk of works to supervise the repainting above referred to, at the wages of 3l. 3s. a week.

**Sanitary Condition of St. Pancras.**—The report of the Public Health Committee contained the following paragraphs:—

"We present, for the information of the Council, a report by the Medical Officer, to which is appended a report by Dr. Hamer on the result of his recent inquiry into the sanitary condition and administration of the parish of St. Pancras. The circumstances which led to the inquiry were as follows:—Early in this year Dr. Sykes, the Medical Officer of Health of St. Pancras, submitted a report to his Vestry in which he showed that, in respect of the number of sanitary inspectors employed, the parish compared unfavourably with other large districts in London. The Health Committee of the Vestry thereupon recommended that two additional sanitary inspectors and an additional clerk should be appointed for a period of twelve months; but the Vestry declined to adopt the recommendation. Dr. Hamer, in a previous report on the question of the regulation of houses let in lodgings, had already pointed out that the supervision could not be exercised over tenement houses in this parish unless the existing staff was strengthened for this purpose, and this report had been communicated to the Vestry before they resolved not to adopt their own Committee's recommendation. In these circumstances we thought it well that Dr. Hamer should make inquiry in the parish, with a view to determining its needs in the matter of sanitary inspection. Dr. Hamer's present report shows that St. Pancras contains a larger number of persons living in tenements of one and two rooms than any other London sanitary district. He compares the results of his inspection of the district with those obtained by similar inspection in Mile End Old Town, Whitechapel, and Lambeth, and points to the unfavourable position of St. Pancras with respect to the number of dirty, dilapidated, and overcrowded houses. Dr. Hamer lays stress upon the need of maintaining a proper standard of house accommodation, and as a means towards that end, of the regulation of the poorer houses let in lodgings. He found in St. Pancras, as he has found elsewhere, that houses in which dirty and dilapidated conditions and overcrowding especially existed occurred in groups, and were evidently associated with particular ownerships. Such houses need supervision much in the same way as common lodging-houses, and with the existing staff of sanitary inspectors it has been found impossible to undertake this duty. For the purpose of maintaining the district in proper sanitary condition, he recommends the appointment of seven additional sanitary inspectors with the necessary clerical staff, and this recommendation is endorsed by the Medical Officer. We have forwarded copies of Dr. Hamer's report to the Vestry, with a request for their observations upon it, and propose to report further to the Council after these have been received. In the meantime, we have given instructions for copies of the report to be circulated among the members of the Council, and placed on sale."

**Reidhaven-road District, Plumstead.**  
"On May 3 last, we submitted to the Council a report by Dr. Hamer on the result of his inspection of the Reidhaven-road district, Plumstead, and we stated that we would again bring the matter before the Council after we had received the observations of the Vestry upon the report. These were submitted in a printed statement forwarded by the Vestry to each member of the Council, and the Vestry have since decided with regard to this district—(a) To increase the strength of the sanitary staff by the appointment of an additional sanitary inspector in place of the food and drugs inspector, a portion only of whose time was given to the work of Plumstead. (b) To register all houses which are occupied by members of more than one family, and at which conditions of dirt and dilapidation are known to exist. (c) To require all defective drains to be re-laid. (d) To apply the water test to all new drains, and where considered by the Surveyor to be practicable to re-lay drains. (e) To apply the water test to all drains constructed by the Vestry, on the same conditions as in the case of private drains. (f) To gather information from other parishes as to the practicability of the water test in all cases, especially where gradients are steep. (g) To require all defective sites to be concreted, and, where necessary, damp courses to be laid. (h) To require the removal of all defective closet-pans, and new closet-pans to be fixed in accordance with the London County Council's by-laws. In these circumstances we do



not propose to take any further steps in the matter at the present time, and we report our action for the information of the Council."

**District Surveyor for North Battersea.**—The Building Act Committee reported as follows, the recommendations being agreed to:—

"The Council on November 10, 1897, consented to the appointment by Mr. H. J. Hanson, District Surveyor of North Battersea, of Mr. J. A. Woodward to act for one year as Deputy District Surveyor for the district, the state of Mr. Hanson's health being such as prevented his carrying out his duties efficiently. Mr. Hanson has asked to be allowed to resume duty as District Surveyor at the expiration of the period named, or that Mr. Woodward may be reappointed as his deputy. The Section (142) of the London Building Act, 1894, which permits of the arrangement, provides that 'if any district surveyor is prevented by illness, infirmity, or any other unavoidable circumstance from attending to the duties of his office, he may, with the consent of the Council, appoint some other person as his deputy to perform all his duties for such time as he may be prevented from executing them.' We are of opinion that, in the public interest, it is advisable that the arrangement sanctioned by the Council should be continued for another year, and recommended.—That the consent of the Council be given to Mr. H. J. Hanson, the District Surveyor under the London Building Act, 1894, for the district of North Battersea, appointing as his deputy, Mr. J. A. Woodward, of No. 66, Kennington Oval, to perform all the duties of such District Surveyor for the period of one year from November 10, 1898; such consent being subject to the condition that Mr. Hanson shall not during the said period, without the previous consent of the Council, to be signified in writing, under the hand of the Clerk of the Council, act as district surveyor, or revoke the appointment of Mr. Woodward as such deputy, or in any way interfere with the performance by Mr. Woodward of his said duties."

**Reprinting of London Building Act, 1894 with Amendment Act, 1898.**—

"The London Building Act, 1894, Amendment Act, 1898, having now become law, we think it would be for the convenience of the public if the Council's edition of the London Building Act, 1894, together with the regulations of the Council as to applications for consent or sanction under the Act and the by-laws now in force relative to buildings, were reprinted and issued, with the Amendment Act, in book form. This would form a complete code with reference to the control of building operations in London. The cost of 2,000 copies bound in cloth is estimated at 76l. 13s., and we think that the copies should, as on the previous occasion, be placed on sale at the price of 3s. each. We recommend that the London Building Act, 1894, with the Amendment Act, 1898, the regulations of the Council as to applications for consent or sanction under the Act, and the by-laws now in force relative to buildings, be printed together in book form, at an estimated cost of 76l. 13s. for 2,000 copies, and be placed on sale at the price of 3s. each copy."

**The Architect's Department.**—The Establishment's Committee recommended, and it was agreed (a) That a retiring allowance of 310l. 13s. 4d. per annum, being thirty-eight sixtieths of his present salary of 500l., be granted to Mr. C. W. White, Chief Clerk of the Architect's Department, as from December 31, 1898, and that up to and including that date his salary be continued to be paid at the rate of 500l. a year. (b) That as from and including January 1, 1899, Mr. Lancaster be styled Chief Clerk of the Architect's Department. (c) That authority be given for the appointment, on the retirement of Mr. White, of a fourth-class clerk in the Architect's Department.

**Proposed New Street (and Streets in Connection therewith) from Holborn to the Strand; and Widening of Southampton-row.**—The Highways Committee reported as follows, the recommendation being agreed to:—

"The Council, on July 5 last, on the recommendation of the Improvements Committee, referred it to us to consider and report upon the question of powers being sought to enable the Council to lay tramways (a) along the proposed new street from Holborn to the Strand, and the new streets to be formed in connexion therewith; and (b) along Southampton-row to connect with the existing tramways in Theobald's-road. With reference to the latter, we would point out that there will be ample time during the construction of the new streets and the widening referred to for the Council to apply for powers to construct tramways along them if it should so decide; and, moreover, the whole question of the construction of new tramways in London will shortly be considered by us, with the assistance of the chief officer of tramways about to be appointed, and we shall be in a better position later on to advise the Council on the subject of the reference. We have therefore come to the conclusion that it would not be advisable for the Council to seek any powers in the Improvements

Bill of next session for the construction of tramways in the streets referred to therein; and we recommend—That, in the Improvements Bill to be promoted by the Council next session, no provision be made for the construction of tramways in the streets referred to in the Bill; and that the Parliamentary Committee be instructed accordingly."

The Council adjourned at half-past seven o'clock.

#### ARCHÆOLOGICAL SOCIETIES.

**NEWCASTLE SOCIETY OF ANTIQUARIES.**—A monthly meeting of members of the Newcastle Society of Antiquaries was held on the 26th ult., in the library of the Castle, Newcastle. Mr. Cadwallader J. Bates (one of the vice-presidents) in the chair. Mr. R. C. Bosanquet read an interim report on the excavations of 1898 at Housesteads, in the course of which he said he hoped that in a short time arrangements might be made for the exhibition of the number of interesting objects found in the course of the work. He thanked the members of the Society and others who had aided him by their counsel throughout the operations. Both universities had aided, not only with money, but also men. He should like to state how much the success of the excavation was due to Mr. Thomas Smith, their late foreman, who took as genuine an interest in the work as any member, and also to Mr. J. Nicholson, who succeeded him.—Mr. Knowles, after describing a building which had been revealed, and of which he had made a drawing, referred to the efficient way in which Mr. Bosanquet had carried out the work. Mr. Bosanquet had taken up his residence on the spot, and had been continuous in his services. He had devoted the whole of his time to the work, had kept a most careful log book, and would be able to give them a voluminous report. Mr. S. S. Carr read "Notes on the Heraldic Glass in Earsdon Church," and Mr. W. W. Tomlinson read "Notes on Jesmond and North Gosforth Chapels, Salter's Bridge, Gosforth, and Burradon Tower," for which both were thanked.

#### ENGINEERING SOCIETIES.

**THE INSTITUTION OF CIVIL ENGINEERS.**—The eightieth session of this Institution was inaugurated on Tuesday evening by an address from the President, Mr. W. H. Preece, C.B., F.R.S., who assumed the chair for the first time after his election. After referring to the position occupied by the Institution as the representative of engineering science in this country the President touched upon the question of technical education, his opinion being that the commercial supremacy of the country was threatened by the operation of causes other than deficiency in technical education. These were the superior commercial skill of principals at home and the accomplished polyglot and well-trained traveller abroad, as well as the existence of a commercial system more moral and sound than that seen in England at the present time. In Germany, the generous and enlightened policy of banks allowed of financial support being readily given to a new industry designed by some simple, well-devised and economical process, whereas in England it required a syndicate, a pioneer company, and finally an appeal to the public for an enlarged limited company. The financiers, the lawyers, the brokers, as well as the original inventor, had to be satisfied, and this satisfaction grew very much with the state of the money market and the excitement for commercial manifested by the public. Thus, though new industries were established, they had to contend with terribly overloaded capital, overloaded by the harpies who had sprung from the operations of the Limited Liability Act. The more technical subject-matter of the address was directed to the growing importance of electricity in regard to the affairs of daily life. Beginning with Faraday's doctrine, which regarded electricity as the result of the play of atoms and molecules of matter, the President traced the development of those ideas as realised in telegraphy, telephony, electric lighting, heating and traction, the transmission of power, and in the various processes included in the term electro-chemistry. A result of the utilisation of electric energy would be the revival of many home industries, to the great advantage of the working classes, whose time was wasted in long excursions to the factory, and whose health, morals, and well-being were not improved by herding in great numbers, and by incessant association with the grievance-monger

and the professional agitator. These considerations led the President to point out that electrical work was fast ceasing to be a speciality, and to prophesy that every engineer must ultimately become an electrician; and he deemed the time not far distant when electricity would be the most general, the most useful, and the most interesting form in which the fundamental principles of energy would be applied to the benefit of mankind.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the London Building Act, 1894. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

**Clapham.**—A wood and glass porch in front of Westview, Thurleigh-road, Balham (Mr. E. U. Story).—Consent.

**Islington, North.**—A two-story addition at the rear of 681, Holloway-road, to abut on Windermere-road, Islington (Mr. J. W. Stevens for Messrs. Knowlman Brothers).—Consent.

**Lewisham.**—Twelve three-story houses with shops on the ground floor on the north-east side of Springbank-road, Hither Green. (Mr. A. C. Baker for Messrs. Osborne, Son, & Company).—Consent.

**Newington, West.**—A building on the southern side of Manor-place, Walworth, adjoining the Coroner's court. (Mr. R. Plimbe for the Vestry of Newington).—Consent.

**Westminster.**—That the application of Mr. C. Fruen for an extension of the period within which the erection of one-story shops on the forecourts of Nos. 96, 95A, 95B, 95, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, and 122, Victoria-street, be required to be commenced, be granted, upon condition that the shops referred to be commenced within twelve months from March 29, 1898.—Agreed.

**St. George, Hanover-square.**—An iron and glass porch at the entrance to No. 23, Park-lane, to abut upon Great Stanhope-street. (Messrs. Starkie Gardner, & Company, for Sir E. Sassoon).—Refused.

**Kensington, South.**—That Messrs. Turner & Co. be informed, in reply to their letter on behalf of Mr. Crowle, requesting permission to substitute a semi-circular roof for the pitch roof shown upon the plans approved by the Council on July 19, 1898, for the erection of an iron and glass covered way at the principal entrance to the De Vere Hotel, Hyde Park-gate, that the Council considers it inexpedient to sanction any departure from the plans referred to.—Agreed.

**Rotherhithe.**—A church on the west side of South-west Park-road, Bermondsey (Mr. J. C. T. Murray for the Building Committee of the Bermondsey Presbyterian Church).—Refused.

**Hackney, South.**—One-story shops upon part of the forecourts of Nos. 140, 142, 144, and 146, High-street, Homerton (Messrs. J. Garey & Son for Messrs. Stevens & Son).—Refused.

**Peckham.**—A one-story addition in front of the Brewery, Hill-street, Peckham (Mr. B. Taberner for Messrs. E. & J. Brooks).—Refused.

**St. Pancras, West.**—An iron and glass covered way at the entrance to the Bedford Music-hall, High-street, Camden Town (Mr. B. Crewe for Messrs. Lucas & Johnson).—Refused.

**Strand.**—That Messrs. Eastman & Company be informed that the Council is not prepared to accede to their request for the Council's consent to retain the wood and glass show-cases erected in front of Nos. 171 and 173, Regent-street, as shown upon the plan forwarded with the applicants' letter in reply to a penal notice served upon them.—Agreed.

**Westminster (detached).**—Two oriel windows to buildings proposed to be erected on the site of Nos. 19, 20, and 21, High-road, Knightsbridge (Mr. C. W. Stephens for Mr. J. C. Humphreys).—Refused.

##### Width of Way.

**Camberwell, North.**—Four houses on the east side of Pitman-street, between Nos. 21 and 27, (Mr. A. Barsh).—Consent.

**Hammer-smith.**—An addition to No. 180, King-street, West, to abut upon Dalling-road, Hammer-smith (Mr. G. Trotman for Messrs. Selden & Son).—Consent.

##### Open Space about Buildings.

**Bethnal Green, South-West.**—A building with a one-story shop in front on lot 14 of the Council's land, on the east side of Ainsworth-street, at the corner of Church-street, Bethnal Green, with an open space at the rear (Mr. C. R. Peters).—Consent.

**Whitechapel.**—A dwelling-house with a factory and office on the ground-floor on the site of No. 19, Church-lane, Commercial-road, with an open space at the rear (Mr. A. C. Payne for Mr. J. King).—Consent.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



### Line of Fronts and Width of Way.

**Fulham.**—A two-story addition on the northern side of No. 4, Fulmer-road, Fulham (Mr. R. Burr for Dr. Ivor Davis).—Consent.

**Fulham.**—Shops and residential flats on the north side of Dawes-road, between Verley-avenue and Estcourt-road, and the proposed position of certain other buildings to abut upon a passage way leading to Pellant-road and Frotheroe-road (Mr. D. Matthews for Mr. F. Batty).—Refused.

### Line of Fronts and Construction of Buildings.

**Rotherhithe.**—A steel gantry across Battle-bridge-lane, Tooley-street, Southwark, at the fourth floor levels of warehouses in connection with Hay's wharf (Mr. E. A. B. Crockett for the proprietors of Hay's wharf).—Consent.

### Width of Way and Temporary Buildings.

**City of London.**—Two iron buildings on a site on the north side of Paul's-alley to abut upon Jacob's well-passage (Mr. T. J. Anderson for Mr. W. O. Aves).—Refused.

### Formation of Street.

**Fulham.**—That an order be issued to Mr. F. Matcham refusing to sanction the formation or laying-out, for foot traffic only, of a new street to lead out of the east side of Harwood-road into Cedar-road, Walham-green (for Sir J. H. Johnson).—Agreed.

### Means of Escape at Top of High Buildings.

**St. George, Hanover-square.**—That Mr. G. D. Martin be informed that the Council is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of the Premier Hotel, Nos. 47 and 48, Dwyer-street, Piccadilly (for Mr. W. G. Hornsey).—Agreed.

**Strand.**—That Mr. W. Emden be informed that the Council is prepared to grant a certificate in respect of the means of escape in case of fire to be provided for the persons dwelling or employed on the fifth and sixth floors of the Hotel de l'Europe, Leicester-square, at the corner of Leicester-place (for Mr. R. Baker).—Agreed.

### Buildings for the Supply of Electricity.

**Chelsea.**—That the Council do approve of a deviation from the plan, deposited with the application of Mr. A. Roberts, for the Chelsea Electricity Supply Company, Limited, for the construction of a generating station on the west side of Flood-street, at the corner of Alpha-place, Chelsea.—Agreed.

*Recommendations marked † are contrary to the views of the Local Authority.*

## THE LONDON BUILDING ACT, 1894 :

### TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act, 1894, sat in the Arbitration Room of the Surveyors' Institution on Friday, the 28th ult., to hear an appeal by Messrs. H. E. & W. Bury, solicitors, on behalf of Messrs. H. W. Hill, against the decision of the London County Council not to sanction certain deviations from the plan certified by the District Surveyor (Mr. T. W. Watson) under Section 43 of the Act, so far as relates to the proposed rebuilding of Nos. 5 and 6, Stanbrook-court, Old Bond-street, St. George's Hanover-square, as shown upon the plans submitted with the application to the Council. The members of the Tribunal sitting were Messrs. Arthur Cates (Chairman), A. A. Hudson, and Penfold.

Mr. Macmorran, Q.C. (instructed by Messrs. H. E. & W. Bury), appeared for the appellants, and the Council was represented by Mr. Seager Berry, from the Building Act Department.

Mr. Macmorran, in opening, said the Tribunal would not be asked to decide any question relating to the construction of the statute, but whether the deviations referred to were such as came within the section, and whether the circumstances were such as to render the further consent of the Council necessary. The history of the transactions between the appellants and the Council dated from May 5, 1897, when Messrs. Hill received from that Authority a notice under the Factory and Workshops Act requiring them to provide for their workshops means of escape from fire. Upon that the appellants consulted Mr. F. E. Eiloart, an architect, who, on his part, entered into negotiations with the officials of the Council, and submitted various suggestions for meeting the requirements of the Act. Certain difficulties, however, presented themselves, and Messrs. Hill were advised that the only way by which they could carry out the terms of the notice was to acquire the premises at the rear of their existing shops—namely, those in Stanbrook-court. Over 40,000l. was spent in thus acquiring the additional premises. Thereupon considerable correspondence ensued between Mr. Eiloart and the County Council authorities, and at length approval was given to plans submitted. In March, however, when the building in course of erection on the site had been raised to the height of the old building the District Surveyor intervened on the ground that the building, if continued, would show deviations

from the original plans, and intimated that it would be necessary to get the Council's further sanction to the plans under the London Building Act. It came as a surprise to his (counsel's) clients that it was necessary, in complying with the Building Act, to obtain sanction beyond that given in the first instance under the Factory Acts. The District Surveyor served notice of irregularity, upon which a summons was issued against Messrs. Hill, and was heard by Mr. De Rutzen at Marlborough-street Police-court on June 21. The Magistrate, after hearing the facts, suggested that a formal application should be made to the Council under the London Building Acts, and the case was adjourned *sine die*. Application was accordingly made to the Council by a letter written by the appellants. He should have thought that the letter under these circumstances would have been regular, but the only reply they received was that the Council refused to consent to the deviations under Section 43 of the London Building Act. They gave no reasons for that refusal; therefore, Messrs. Hill had no alternative but to come before the Tribunal of Appeal. His clients considered that they, after paying an immense sum to comply with the Factory and Workshops Act, had been subjected to great hardship not to say injustice by the refusal of the Council to sanction the plans. The position of the appellants was clearly set out in a letter from Mr. H. W. Hill to the Council on July 15, in which he stated:—"In the course of the correspondence which passed between me and the Superintendent Architect of the Council and more particularly by the letter dated October 9, enclosing plan of the proposed alterations, I made it clear that the premises in Stanbrook-court, which would have to be pulled down and rebuilt for the purpose of complying with the notice, would be rebuilt to a greater height than the original building. Upon receiving the approval of the Council contracts were entered into for the carrying out of the works, and the works proceeded. I was not aware, nor was my architect, that any further approval or sanction of the Council would be required, and it was with some surprise that on May 28, 1898, my builders received from the District Surveyor a notice of irregularity, to the effect that in rebuilding the premises in Stanbrook-court I had contravened Section 43 of the London Building Act in that I had deviated from the plan certified by the District Surveyor under the said Section of the domestic building existing on the site at the passing of the said Act, and without having obtained the sanction of the London County Council or of the Tribunal of Appeal to such deviations. At the date of receiving this notice the building was more than halfway built. My present application to the Council is that, under the circumstances, they should sanction the erection of the new building as shown in my plans, or in so far as the works approved by the Council for the purpose of complying with the notice under the Factory Acts may be a deviation from the certified plans within the meaning of the said Section."

Mr. Frederick E. Eiloart, architect, of 40, Chancery-lane, W.C., gave evidence in support of the appeal, and was cross-examined at considerable length by Mr. Seager Berry.

In the course of the proceedings the Chairman stated that in coming to that decision they had considered all the circumstances.

## Correspondence.

### To the Editor of THE BUILDER.

### GODALMING TOWN HALL COMPETITION.

SIR,—With reference to your notes on the Godalming Competition for Municipal Buildings, you mention that the plan selected complies with the spirit but not with the letter of the instruction.

As one of the competitors, I am inclined to think that the majority of them will not regard this matter as quite such a trifle as you appear to suggest.

Possibly you are not aware that the Instructions distinctly required the following, viz.:

1. That there should be a 10-ft. way left open along the south side of the public hall.

2. That this way was to be left as indicated on the block plan supplied, in which the 10-ft. way was coloured yellow.

3. That the instructions allowed of building in this position only on the first floor.

4. That in answer to a question as to whether the 15-ft. back road may not be used for the engines instead of the passage "through centre of site," as suggested, the reply printed and given to all the competitors was:—"The 10-ft. passage into Bridge-street is regarded as essential if the engine-house is placed on the back site."

The one item was of such importance that it controlled the whole of the planning.

The design selected seems to have been chosen because it ignored this instruction, and instead of (as one might have thought it in fairness should have done) disqualifying the design, it seems to have qualified it for the first place.

If the Town Council and others think this a satisfactory issue, I do not think that any of those who honestly endeavoured to comply with the instructions will be likely to agree with them.

A COMPETITOR.

\*.\* Our correspondent, at our request, has sent us the printed Instructions and plan, which the Editor of this journal had not before seen, or some fuller observation would have been made on the points referred to. The statement in the "Answers to Questions" is quite clear that the 10-ft. passage in the position referred to is obligatory on competitors. In ignoring it the successful competitors have made a better arrangement and a better design than was possible by adhering to it, but they have none the less infringed the conditions, and ought, in justice to the other competitors, to have been disqualified accordingly. If competitors are to be fairly conducted, the specified conditions must be adhered to, and in our opinion an assessor ought to insist on this view.—ED.

## DIFFICULTIES IN SKETCHING BUILDINGS.

SIR,—Will you kindly allow me a small space in your journal to point out one of the difficulties which beset the architectural student?

The most obtrusive of these is the difficulty and delay consequent on the obtaining of permission to sketch in Museums and in ancient buildings. It is absolutely necessary that the students should sketch from the actual buildings or parts of the buildings, or at least from casts, in order to fully understand the real forms and features of both mouldings and ornaments, as well as the grouping and proportion of parts in their relation to one another. I hold, further, that it is even more necessary to make sketches of the ornaments, mouldings in clay or wax, if you wish to have a just perception of their true form.

This is a matter which no amount of reading or illustrations will fully supply, and is to be obtained only from actual sketching from several points of view, or, better still, from modelling.

It is not a pity that the numerous storehouses of such valuable treasures as we possess should be so inaccessible to the sketching student who is anxious to avail himself of every opportunity to sketch, and therefore impress each detail and motif of design on his memory?

Would it not be possible for the R.I.B.A. or some such body to acquire the power of granting their students sketching tickets at the payment of a small sum annually, or for a stated period?

If this could be arranged it would materially assist the student, and would place within his reach the means of acquiring a thorough knowledge of the various and complex peculiarities of style, without which it is impossible for him to design new forms or adapt old.

STUDENT, R.I.B.A.

## The Student's Column.

### SOUND, LIGHT, AND HEAT—XVIII.

#### LIGHT: QUALITIES.

**B**ODIES which readily transmit light are said to be diaphanous, or transparent; those which do so less readily and through which objects cannot be definitely distinguished are called translucent; whilst bodies which do not allow an appreciable proportion of light to pass are known as opaque. Theoretically, no natural bodies are quite impervious to light, it being assumed that in those which are of the densest opacity the rays can find their way through very thin sheets by reason of that all-pervading property of matter, porosity. Nevertheless, such substances as magnetite, pyrites, and ilmenite can only permit the passage of light rays in infinitesimal degree.

In a homogeneous medium, light is propagated in a straight line. If an opaque substance be placed in the path of a pencil of light (a collection of rays emanating from the same source) a shadow results, which shadow is most dense immediately behind the obstructing substance, and less deep on receding from it. A certain quantity of light must always pass into the shadow, even when the source of light is a mere point and not a general surface (as, for instance, the sky). This phenomenon, known as diffraction, is of much interest to the student of architecture, as in "light and air" cases the question in dispute frequently hinges on the quality and proportion of this diffraction promoted as such by the elevation of the obstructing building or other erection.

#### Diffraction.

It is not difficult by experiment to prove diffraction, but unfortunately the proportion of light overlapping the shadow in its relation with the quantity of light initially cut off by



the obstruction, has never been carefully studied by physicists. Consequently, we have empirical rules laid down in by-laws and the like, which rules may be adequate or inadequate, depending on the actual site dealt with. Thus the height of houses is sought to be limited by the breadth of the street between them. An angle of 30 deg., 45 deg., 50 deg., or what not, measured from the middle of the road, is brought into play. The direction of the street with reference to the source of light is not usually taken into account, though recognised in a way. As a matter of fact, the angle permitted is often too high, when the unfortunate occupants of the lower parts of the houses in the street hardly ever catch a glimpse of light which is not artificially modified.

Diffraction can be and is largely bound up artificially with reflection (of which more presently) and in practice it is the latter, taken in a compound sense, with which people are most familiar. The majority of studies in diffraction have been carried out by examining the phenomena as given by a mere pencil, or thin slit, or "slice" of light. The following experiment—narrated by Ganot (*Op. cit.* p. 634) is interesting—A beam of sunlight is allowed to pass through a very small aperture in the shutter of a dark room, where it is received on a condensing lens, with a short focal length. A red glass is placed in the aperture so as to allow only red light to pass. An opaque screen, with a sharp edge—a razor, for instance—is placed behind the lens beyond its focus, and intercepts one portion of the luminous cone, whilst the other is projected on a screen. The following phenomena are now seen—Within the geometrical shadow a faint light is observed, which gradually fades in proportion as it is farther from the limits of the shadow. In the upper part of the screen a series of alternate dark and light bands or fringes is seen parallel to the line of shadow, which gradually becomes more indistinct and ultimately disappears. The limits between the light and dark fringes are not quite sharp lines; there are parts of maximum and minimum intensity which gradually fade off into each other. If, instead of placing the edge of an opaque body between the light and the screen, a very narrow body be interposed, such as a hair or a fine metal wire, the phenomena will be different—within the shadow there is a series of alternate light and dark bands. Another class of diffraction is produced by allowing a pencil of light to traverse an aperture, the latter being in the form of a narrow slit in an opaque screen.

The difficulty, from the practical point of view, of applying methods of proving diffraction has already been foreshadowed in the sentence showing that the phenomenon is much bound up with reflection. The grounds for compensation are based almost always on the total amount of light cut off from "all sources." The lawyer makes no pretence of separating these sources, so that the expert witness must combine these three things—light due to diffraction, reflection, and (it may be) refraction.

#### Intensity of Light.

The following well-known laws may here be quoted in relation to the intensity of light:—

1. The intensity of illumination on a given surface is inversely as the square of its distance from the source of light.

2. The intensity of illumination which is received obliquely is proportional to the cosine of the angle which the luminous rays make with the normal to the illuminated surface.

#### The Photometer.

This instrument is for measuring the intensity of light. In the form devised by Rumford, the qualities of two shadows thrown from one object (usually a rod) by two lights of different intensity, are so adjusted by altering the position of one of the lights, that the two shadows shall appear identical. It will be seen that to get this result, the relative position of the two lights is the controlling factor. The intensities of the two lights (*i.e.*, the illumination they give at equal distances) are found to be directly proportional to the squares of their distances from the shadows.

The best-known photometer in this country is that of Bunsen, which depends on the appearance of a specially-prepared grease-spot in lights of certain intensity—known as standard lights. By this means the illuminating power of coal-gas, and other artificial lights, is tested.

Turning to another class of instruments, for recording the intensity and duration of sunshine, we are confronted with many difficulties

which these instruments are supposed to take into account. The immediate intensity of a sunbeam can readily be ascertained by standard measure, but that is a different matter to ascertaining successive and ever-varying changes in general intensity. Clouds, relative clearness of the sky, varying thickness of atmosphere depending on position of the sun, and other, mainly meteorological, phenomena have to be taken into account. Photography can give a continuous record of general diffused light throughout the day; but it has not, up to the present, dealt satisfactorily with direct sunshine, so far as we are aware.

The duration of sunshine is best measured, perhaps, by a ball of glass, which acts as a "burning lens." A cardboard strip divided into hours and parts is fixed under the ball; when the sun shines a spot is burned, and if it shines continuously for some hours a line is traced for that period on the cardboard strip.

#### BOOKS RECEIVED.

GAS AND PETROLEUM ENGINES. Translated from the French of Henry de Graffigny, by A. G. Elliot, B.Sc. (Whittaker & Co.).

CHEMISTRY IN DAILY LIFE. By Dr. Lassar-Cohn. Translated by M. M. Pattison Muir (H. Grevel & Co.).

JOURNAL OF THE SANITARY INSTITUTE. Vol. XIX.: Part III. (Edward Stanford.)

THE LAW OF NEGLIGENCE. By T. W. Saunders. Second Edition; re-written with additions by E. Blackwood Wright (Butterworth & Co.).

#### OBITUARY.

MR. LATIMER CLARK.—By the death of Mr. Latimer Clark, F.R.S., last Sunday, at the age of seventy-six, we lose another of the few remaining pioneers of submarine telegraphy. He was the fourth President of the Institution of Electrical Engineers, which was then called the "Institution of Telegraph Engineers," and down to his death took the greatest interest in its welfare. Only last January, in presenting several volumes of pamphlets and papers of the late Mr. Jacob Brett to the Institution, he said:—"I am one of the older members, and, being about to throw off harness, I feel it a duty to collect these unique and invaluable records and to place them in hands where they will remain permanently secure." It was a great satisfaction for him to know that these records prove without the possibility of a doubt that the English nation was the first to introduce submarine telegraphy to the world. Mr. Clark's earliest work as an engineer was in assisting to construct the Britannia Tubular Bridge across the Menai Strait, his brother, Mr. Edwin Clark, being the resident engineer. Whilst there he arranged a time-gun to be fired electrically every evening at eight o'clock, and it was this contrivance that brought him to the notice of the chairman of the Electric Telegraph Company, who appointed him in 1850 assistant-engineer, and shortly afterwards engineer-in-chief. In 1854 he invented the system of the pneumatic transmission of messages, which has been so extensively used by the Post-Office. Two years later he invented the double-cup insulator, now universally employed in telegraph work, and soon afterwards "Clark's Compound," which is still widely used for insulating and protecting cables. Mr. Latimer Clark was one of the most useful members of the Committee appointed by the Government in 1859 to inquire into the cause of the numerous failures of the attempts at oceanic telegraphy, and he issued a valuable supplementary report giving the laws of the rise and fall of the electric current in a submarine cable. For the next ten years, in partnership with Sir Charles Bright, he was a consulting engineer, and supervised many cable enterprises. During this period also he helped to crystallise electrical nomenclature and methods. He originated the system of electrical measurements in volts, amperes, and farads, and his book, published in 1863, was for many years the standard work on the subject. In 1873 he invented the Clark cell, which was adopted by the Board of Trade twenty years afterwards as the standard cell for electrical pressure. The volt is legally defined as 0.0974 of the pressure between the poles of a Clark cell at a temperature of 15 deg. centigrade. As head of the firm of Clark, Forde, & Taylor, he was concerned with the production of over 10,000 miles of submarine cable, and as partner in the late well-known electrical firm of Latimer Clark, Muirhead, & Co. he brought out many important inventions and improvements in electrical apparatus. He was also head of the firm of Clark & Standfield, the well-known dock engineers. Mr. Clark was deputy-chairman of the St. James and Pall Mall Electric Lighting Company, and was a director of the Central Electric Supply Company. Notwithstanding his numerous business engagements in later years he found time to make many original investigations both in electricity and astronomy. He was a Chevalier of the French

Legion of Honour, and was elected a Fellow of the Royal Society in 1889.

COLONEL WARING.—It is with great regret that we announce the death of Colonel George E. Waring, M.Inst.C.E., who was for a short time the able Commissioner of Street Cleaning in the City of New York. His death was due to an attack of yellow fever, caught during a recent visit to Havana. He was a well-known and able writer on sanitary matters, among his works being "Sewerage and Land Drainage," "The Sanitary Drainage of Houses and Towns," and "Modern Methods of Sewage Disposal," the last being one of the best short accounts of the subject we know, although, of course, some progress has been made in our knowledge of methods and principles since its publication in 1894. His book entitled "Street-cleaning and the Disposal of a City's Wastes" is a record of his important and laborious work as Commissioner of Street-cleaning in New York, and shows, without a trace of boasting, how he purified a corrupt department, and cleansed the vile streets of the metropolis of the New World. But his time and thought were not entirely given to sanitation. A volume of short stories, and at least three books of travels in Europe, bear witness to the breadth of his sympathies and to his literary ability.

MR. T. KENRICK.—The death has just taken place, at his residence, 4, Brompton-road, Southport, at the age of seventy-two, of Mr. Thomas Kenrick, the oldest master-builder in the town. He went to Southport thirty-five years ago.

MR. JOHN GREEN.—The death is announced of Mr. John Green, contractor, which occurred at his residence in Warkworth on the 30th ult. Deceased, who was sixty-eight years of age, commenced business on his own account some forty years ago as a contractor and builder, and a few years later entered into partnership with the late Mr. Thomas Douglas, of Amble. The firm carried out some large contracts. At Mr. Douglas's death Mr. Green took his sons into the business.

#### GENERAL BUILDING NEWS.

ST. MARYLEBONE WORKHOUSE: NEW WARD BLOCKS.—These buildings, now in course of erection, comprise two large double ward blocks, connected on the ground floor and basement. Each block will be three stories in height above the ground floor, with a fourth story over the centre part. The top and third floors will contain wards and day rooms for infirm men too feeble to leave them. The roofs over the wings will, however, be flat, and available for such of those inmates as may be able to take advantage of them. The second floor will contain dormitories only, and the first dormitories and two large day-rooms. The outer wing of both blocks will contain, on the ground floor, accommodation respectively for male and female imbeciles and lunatics, the inner wings being divided into two large general day-rooms. The centre rooms between the blocks on this floor will be occupied as an overflow dormitory. The total accommodation will be 555 beds for old and infirm men, eleven male and ten female imbeciles, and three male and three female lunatics. The basements are divided into a number of large rooms, the effective lighting and ventilating of which is ensured by wide areas both back and front, and in addition the levels of the ceilings will be 4 ft. above the general ground level. These rooms will be devoted to a complete set of workshops. The centre part of each block contains the general staircase, which will be lined throughout with white glazed bricks. Light and ventilation is provided by a large lantern and skylights. Adjoining these staircases on each floor are officers' rooms and small one-bed dormitories; the towers in the rear contain the bath-rooms, lavatories, water-closets, &c. Airing yards, properly divided for classification, will be formed both at the back and front of the buildings. The walls of all dormitories will be finished with cement dados 4 ft. 6 in. high, and plaster above. The day-rooms will have glazed brick dados. All bath-rooms and lavatories will be lined with white glazed tiled dados, 7 ft. high; and the water-closets, &c., will be faced their whole height with white glazed bricks. The front of the building and returns will be faced with hard-faced red bricks, relieved with stone bands and dressings. The ground-floor story will, however, be entirely in rusticated stone. The back elevation will be faced with white pressed bricks, relieved with red bands and arches to match the adjoining older buildings. The work is being carried out at a cost of £2,100, by Messrs. G. H. & A. Bywaters & Sons, from the designs and under the superintendence of the architect, Mr. A. Saxon Snell. The quantity surveyors are Messrs. Northcroft, Son, & Neighbour; and the clerk of works is Mr. Frederick W. Lee.

ST. PETER'S EPISCOPAL CHURCH, GLASGOW.—The memorial stone of St. Peter's Episcopal Church was laid on the 22nd ult. by Lord Kelvin. The church is being built on a site in Gardner-street, off New City-road, from plans prepared by Mr. James Chalmers, architect, Glasgow. The interior consists of a large nave, two aisles, and chancel. The church is 85 ft. long, 55 ft. high, and 75 ft. broad, and is divided into nave and aisles by four bays. The eastern bay forming the chancel is divided from the nave by a chancel arch and rood screen. The eastern window is a three-light one. The



channel is 32 ft. deep, and extends the full width of the nave—29 ft. To the north of the channel is the organ-chamber, 21 ft. by 25 ft.; and on the south is a small chapel, similar in size to the organ-chamber. The interior is finished with Bath stone and Ruabon red brick, while the pillars are of Prudham stone, from Northumberland. Stone from Giffnock quarries is used for the arches, but the pulpit and altar rails are of white stone. The whole of the work was contracted for by Messrs. Morgan & Son.

**ST. ALBAN'S CHURCH, BLACKBURN.**—On the 15th ult. the foundation stone of St. Alban's new church was laid by the Bishop of the Diocese. The church consists of a nave and aisles. The aisles are continued right round the sanctuary. There are north and south transepts, opening into two side chapels. The church will be built of Yorkshire parpint, with Bath stone dressings. The west window will consist of nine lights. Each transept will be lit with seven-light windows. There will be large working clerks', and clergy's vestries, the heating apparatus being underneath. The design includes a loft tower, and spire, to contain a full peal of bells. The church is estimated to cost 20,000l. Mr. Goldie, of London, is the architect; Mr. Boland the contractor, and Mr. J. Price, of Preston, is the clerk of works.—*Catholic Times*

**MISSION CHURCH, REDLAND, BRISTOL.**—A temporary church (St. Katharine) was dedicated at Redland on the 22nd ult. The building has been erected on land in Salisbury-road. Messrs. P. Munro & Sons were the architects. The building is 108 ft. long and 36 ft. wide, the roof rising to a height of 50 ft. The chancel and sanctuary at the east end are approached by a few steps. There is a porch on the north-west side. The building, which is constructed of Pennar stone, is Gothic in style, the open roof being of pitch pine, and covered with Broseley tiles.

**PARISH CHURCH, QUEENSFERRY.**—This church, which during the past four months has been undergoing alteration, was reopened on the 23rd ult. The church, which was erected in 1833, bears the marks of frequent alteration. The fabric remains as it was, but the interior has been renovated and decorated. The old-fashioned pulpit, with its heavy canopy, and the straight-backed pews have been removed. The interior has been replastered, and stone mullioned windows, with cathedral tinted glass, have been introduced. A broad central aisle now replaces the former side aisles, and the gallery has been modified. The most characteristic feature of the new work is the stone chancel, containing a beautiful oak communion table, a baptismal font and reredos. In the east gable a two-light stained glass window has been inserted. The architect was Mr. P. McGregor Chalmers, Glasgow.—*Scotsman*.

**NEW VESTRIES AT THE PARISH CHURCH, YARMOUTH.**—On the 27th ult. the stone-laying ceremonies in connexion with the proposed new vestries at the parish church took place. The site of the new vestries is at the north-east end of the edifice, and the architect is Mr. F. L. Pearson, of London.

**CHURCH RESTORATION, STAINTON, YORKSHIRE.**—On the 28th ult. the Archbishop of York attended the re-opening service in connexion with St. Winifred's Church, Stainton, near Rotheman. The edifice has been restored at a cost of some 1,100l. exclusive of the tower, which received attention three years ago, at an outlay of 350l. The restoration has been carried through under the direction of Mr. J. D. Webster, architect, of Sheffield, and the contractors were Mr. J. Fisher, Eddington, builder; Messrs. J. Badger & Sons, Sheffield, joiners' work; and Messrs. Wright, Sheffield, heating apparatus.

**ORGAN TRANSEPT, ANSFORD, SOMERSETSHIRE.**—The Archdeacon of Wells opened, on the 26th ult., the new organ transept which has been erected at the parish church. The new transept has been built by Messrs. Francis & Sons, of Castle Cary, from the plans of Messrs. C. & C. Benson, architects, of Yeovil.

**CHURCH, LYTHAM, LANCASHIRE.**—The new Church of St. Thomas, Lytham, will shortly be commenced. A site has been obtained on South-drive upon which to erect the edifice, which is estimated to cost 8,000l. The architects, Messrs. Austin & Paley, have prepared plans which provide for the accommodation of some 800 worshippers.

**NEW CATHOLIC CHURCH, STANLEY, DURHAM.**—The designs for this church, which is in progress, show accommodation for about 700. The buildings are to be in the Early English style, stone and slated. The body of the church consists of a single nave with transepts with west and gallery, and span nave and transepts with west and gallery. The main and two side altars are in separate apses. There are separate sacristies for clergy and servers in communication with the presbytery and the east end of the church, and confessionals and baptistry are offshoots from the main building. The whole is to be heated by hot-water apparatus. The architect is Mr. Chas. Walker of Newcastle-on-Tyne.

**CONGREGATIONAL CHURCH, MUSWELL HILL.**—The foundation-stone of a new Congregational church was laid at Muswell Hill on the 22nd ult. The architect is Mr. P. Morley Horder.

**MEMORIAL CHURCH, TOPGROFT, NORFOLK.**—On the 25th ult. the Congregational Church which has been built at Topgroft, in memory of the late Mr. Samuel Newton Delf, was opened. The new building, which has been designed by Messrs.

Edward Boardman & Son, of Norwich, consists of church, porch, and vestry. The size of the church is 38 ft. by 23 ft. 6 in. It is lighted by a mullioned window at the west end, with four windows on the south side and two on the north. The rostrum is at the east end, and behind it is the door of the vestry. The contractors were Messrs. S. V. Brock & Sons, of Alburgh.

**CONGREGATIONAL HALL, BUNGAY, SUFFOLK.**—On the 26th ult. a new lecture hall, attached to the Congregational Church, Bungay, was opened. The hall is 43 ft. in length by 19 ft. in width, and 15 ft. in height. Attached to the hall, and forming part of the main building, is the minister's vestry. Messrs. G. Martin & Son were the contractors, and the building has been erected from plans and specifications prepared by Mr. J. O. Rees.

**PRIMITIVE METHODIST CHAPEL, BURSTWICK, YORKSHIRE.**—On the 27th ult. the new Primitive Methodist Church was opened at Burstwick. The plans were prepared by Mr. T. B. Thompson, of Hull. The chapel and school are separated by a movable screen. There is a class-room for about twenty persons, and a kitchen and heating vault. A small vestry has been erected at the south side of the building. The total cost will be about 1,025l.

**BRITISH SCHOOL, DORRING.**—The new British school which has been erected in Dorring, Dorset, was opened on the 19th ult. The building, which provides accommodation for 400 boys and girls, has been erected by Messrs. Colls & Sons, of London, from the plans of Messrs. Balfour & Turner, architects, London.

**ST. MARY'S SCHOOLS, ASTON, BIRMINGHAM.**—The foundation-stone of a new infants' school was laid on the 19th ult. at St. Edward Holm, of Birmingham, prepared the plans of a school to accommodate 400 children, and comprising school-room, two class-rooms, babies'-room, mistress'-room, and the usual adjuncts. The building will be of brick. Messrs. Lee & Son are the contractors.

**SCHOOL, WEST TIVERTON.**—On the 29th ult. the block of new schools at West Tiverton, which have been erected by the School Board of that place, was opened. The architects are Messrs. Silcock & Reay.

**ROMAN CATHOLIC SCHOOLS, BIRTLEY.**—The new school buildings in connexion with St. Joseph's Roman Catholic Church at Birtley were opened on the 29th ult. The buildings have been erected from the designs of Mr. Charles Walker, of Eldon-square, Newcastle, by Messrs. Joseph Burnett & Sons, of Birtley, at a cost of 2,500l. Accumulated funds have been provided for over 300 scholars.

**RESTORATION OF ORDSALL HALL, NEAR MANCHESTER.**—The whole of the restorations of this ancient hall, and the additions and alterations which have been made, are now practically complete. Messrs. Darbyshire & Son are the architects, and Messrs. Brown & Son the contractors for the whole of the works.

**SOLDIERS' HOME, LONDON.**—Alterations and additions to the Soldiers' Home in Buckingham Palace-road have been carried out. A new hall has been built and sixteen more beds added, ten of them in private cubicles over the hall, and a new corridor from the old building. The hall is 38 ft. by 25 ft. and will seat 150 persons. The rooms of the Lady Superintendent and her staff are shut off from the soldiers' department. The architect of the new building was Mr. Robert Curwen.

**CLOCK TOWER, SKEGNESS.**—The foundation-stone has been laid of a clock tower at Skegness, to serve as a memorial of her Majesty's reign. The architect is Mr. Winter, and Mr. H. W. Parker, of Boston, is the builder. For the basement, ornamental Ancaster stone will be employed, and the remainder of the tower will be treated in red brick, and when completed will stand 60 ft. high.

**LIBERAL CLUB, GREENFIELD, LEICESTER.**—Sir James Wilson, Bart., M.P., opened a new architectural club at Greenfield, on the 22nd ult. The building is of stone, and it has been erected at a cost of close upon 1,000l., from the plans of Mr. J. T. Bradbury, architect, Greenfield.

**TOWN HALL, OUNDELE.**—The committee have provisionally accepted the tender of Messrs. Siddons & Freeman, of Oundle, for 1,750l. for the erection of this building. Mr. J. B. Corby, Stamford, is the architect.

**UNIVERSITY COLLEGE, ABERYSTWYTH.**—On the 26th ult. the new central block of Aberystwyth University College was opened by Sir William Harcourt. The college, which was opened in 1872, faces the sea at the side of Castle Hill. In 1884 a large part of the building was destroyed by fire, but it was immediately rebuilt. On the south side of the house a new wing had been previously erected, and after the fire it was adapted to the requirements of a school of science. But between these two blocks of building of yellow freestone there remained the cemented low central building of the old house with its wings and offices. The work that has now been undertaken and brought practically to completion has been the rebuilding of the central block, to provide those laboratories, lecture rooms, and other work-rooms essential to the development of the educational work of the institution, to unite the previously existing and semi-detached wings of the science and arts, and to make the building into one complete fabric with a centre worthy of the earlier wings. The central block is four stories in height, with a basement under the whole of it. The basement pro-

vides two rooms towards the sea, cellars for the purposes of heating and for the engines and other apparatus in connexion with the ventilation of the building and the extraction of fumes from the various laboratories. On the ground floor is provided an entrance from the sea front, with a waiting-room attached, with halls and corridors connecting the arts and science wings of the building, together with a central hall and staircase. The front towards the sea is occupied with the official rooms of the college, the principal's room, the registrar's room, the office, and with a small laboratory connected with existing laboratories of the science wing. On the east or King-street front are the caretaker's house and a series of cloak-rooms and lavatories. On the first floor are provided a lecture-room, 27 ft. by 24 ft.; a students' laboratory, 36 ft. by 31 ft.; a suite of rooms for the analyst, a balance-room with a private room, and store-rooms in connexion with them. On the second floor are an advanced laboratory of the same size as the lecture-room below it, a lecture-room for botany and zoology, 36 ft. by 22 ft., a smaller lecture-room for zoology and botany, with private rooms, diagram and incubator rooms with private rooms, preparation rooms, and diagram rooms attached. On the third floor are two laboratories for botany and zoology, one for men and one for women, a lecture-room for agriculture and veterinary science (with the usual accessory rooms in connexion with them). The architect was Mr. C. J. Ferguson.

**VOLUNTEER DRILL-HALL, BOURNEMOUTH.**—The foundation-stone of a drill-hall for the Bournemouth Batteries of the Dorsetshire Regiment of Artillery Volunteers was laid recently. The new building will contain a drill-hall, 92 ft. by 60 ft., the special flooring necessary for heavy gun practice being laid by the Royal Engineers, under the direction of the Crown authorities. On the left of this hall will be the magazine and necessary offices and rooms, and of quarters for the resident sergeant-major. The total cost of the building will be about 3,000l. It is being erected on a site at the Christchurch-road end of the Lansdowne-road. The architects are Messrs. Creeke, Giffard, & Oakley, and the builders are Messrs. Miller & Sons, of Bournemouth.

**NEW OPERATING THEATRE, SWANSEA HOSPITAL.**—The new operating theatre which has been added to Swansea Hospital was opened on the 28th ult. The new building is connected with the west corridor of the hospital. It is oval in shape, 26 ft. long by 22 ft. wide, and the roof is in the shape of a dome. The exterior is designed so as to be in keeping with the surrounding hospital buildings, being built of native stone, with dressings of Bath stone. The contractor for the general work was Mr. Henry Billings, of Swansea, and the architects are Messrs. Wilson & Moxham, of Swansea.

**PUBLIC HALL, HARTLEY WINTNEY, HANTS.**—The opening of the parish hall, which building has been erected by public subscription in commemoration of the Diamond Jubilee of her Majesty Queen Victoria, took place on the 27th ult. The hall is capable of seating over 400 persons. The architect was Mr. T. E. Colcutt, while Messrs. Pool & Son were the builders.

**NEW WING, STOCKPORT INFIRMARY.**—The foundation stone of the new north wing of this building was laid on the 27th ult. The extensions now in course of erection consist of a pavilion block four stories high, in line with, and in continuation of, the present range of buildings facing Wellington-road, and a laundry and mortuary block on the land at the rear of the main buildings. The pavilion block covers an area of 2,000 sq. ft. of ground, and will provide the following accommodation: Two wards for fourteen beds each, with the usual ward scullery and bath-room at the entrance end of the wards, and a suite of sanitary offices in a tower at the far west end of ward; a suite of servants' bedrooms for fourteen beds on the top floor, with similar sanitary and bath-rooms, with suite of rooms attached for anaesthetics, instruments, &c., and surgeons' rooms, and a two-bed surgical ward; a matron's suite of rooms, consisting of sitting bed, and bath rooms; day room on the ground-floor level, with a patients' recreation room under the wards on the lower ground-floor level; and on this floor also a doctors' bath-room and sanitary conveniences; various store-rooms and heating cellar. Communication is obtained between the whole of the above rooms by means of a stone staircase. The laundry and mortuary block covers an area of about 250 superficial yards, and comprises washhouse, with finishing room, boiler-house, coals, and servants' room, and a room for the laundry. The mortuary consists of a small room for the body, with three slabs, and a post-mortem room adjoining. The area of the portion of Frances-street, at the rear of the main buildings, which has been acquired for these extensions, is about 300 superficial yards. The architects are Messrs. Woodhouse & Willoughby, of Manchester. The contractors are Messrs. Meadows.

**CHURCH INSTITUTE, GATESHEAD.**—On the 29th ult. this building, erected in connexion with St. Paul's Church, Low Teams, Gateshead, was opened. The Institute consists of a billiard-room and committee-room on the ground floor, the latter room opening into the Parochial Hall, and on the first floor a room for amusements, and a reading-



room. The cost of the building was £301. It has been built by Mr. J. Anderson, of Newcastle, from designs by Messrs. Oliver & Leeson.

**CO-OPERATIVE STORES, CONSETT, DURHAM.**—On the 29th ult. the foundation-stones of the new business premises for the Consett Co-operative Society were laid on the site of the buildings destroyed by fire in November last. The contractors are Mr. J. G. Bradley, Durham, while the designs were prepared by Messrs. Liddle & Brown, architects, Newcastle.

**BUSINESS PREMISES, LONDON.**—On the 27th ult. the foundation-stone was laid, at 29, Great St. Helen's, of a building which will comprise about a hundred offices. The land covers an area of 7,000 ft., and entrance to the property will be gained from Great St. Helen's and St. Mary-axe. The new building is being erected by Messrs. Colls & Sons, from plans prepared by Mr. T. H. Smith, architect.

**TOWN HALL, COLCHESTER.**—The foundation-stone of this building was laid on the 31st ult. by the Duke of Cambridge. The architect of the Town Hall, which was illustrated in the *Builder* for September 4, 1897, is Mr. John Belcher, of London. The cost will be about £30,000.

## SANITARY AND ENGINEERING NEWS.

**BRIDGE, LEICESTER.**—On the 24th ult. the Mayor of Leicester opened Newark Bridge, which has been erected from the designs of the Borough Surveyor, Mr. G. E. Mawbey. Messrs. Bentley, Son, & Partington were the contractors.

**THE REBUILDING OF KEW BRIDGE.**—At the monthly meeting of the Middlesex County Council on the 27th ult. the Finance Committee on behalf of the joint committee of Surrey and Middlesex presented supplementary estimates to the extent of £35,000, for the rebuilding of Kew Bridge. The report of the joint committee showed that while the estimate of the total cost of the widening given by their engineer—Sir J. Wolfe Barry—was £18,000, the cost of seven tenders received for the work, that of Mr. Easton Gibb, of Liverpool, Yorkshire, was £160,288. In reply to a request for an explanation, Sir J. Wolfe Barry reported that his estimate was based on the prices paid for similar work at the Tower Bridge, with a considerable addition. He suggested that the cost of all work in the neighbourhood of London had been steadily increasing during the past two years owing to the obligations imposed by the Employers' Liability Act, the action of the London County Council with regard to the terms of labour, and the great demand for materials at the present time. He estimated that 20,000, to 25,000, might be saved by the substitution of internal brickwork or concrete for stonework. The committee further reported that they had ascertained that a reduction of about 200,000 might be made on Mr. Gibb's contract in the way suggested, and they recommended that the tender should be accepted for a sum not exceeding 150,000, and that a Bill be promoted to authorise the additional borrowing. Mr. Burt, of Highgate, moved as an amendment to the report of the joint committee that the Council should not entertain the proposed additional expenditure, but should refer the matter back to the joint committee with a view of bringing the total cost of the bridge approximately within the amount authorised by Parliament, and this was carried by thirty-two votes to eight.

**LANCUNSTON SEWAGE WORKS.**—New sewage works have just been completed at St. Leonard's, Ford. The works were commenced in November, in March, 1898, by Mr. E. Sharland, who was the contractor, acting under the instructions of Mr. A. P. I. Cotterell, Assoc. M.Inst.C.E., at a total cost of 4,200, were opened on the 25th ult.

**THE DRAINAGE OF DOUGLAS.**—At Douglas on the 27th ult. a committee of the Tynwald Court sat in the matter of the application of the Douglas Corporation to Tynwald, for authority to borrow 20,000, for the purpose of improving the drainage of Douglas in addition to the sum of 35,000, already authorised to be borrowed for the purpose. Mr. J. J. J. supported the application of the committee, while Mr. Hughes James opposed on behalf of a clause of the Council should not entertain the proposed low level scheme of drainage, as unnecessary, and that a gravitation scheme was sufficient for the town. There were fifty-eight basements in the town below the high-tide mark. Mr. E. H. Stevenson, C.E., of London, the author of the high and low level scheme adopted by the Corporation, gave evidence as to the liability of the basements in the town to be flooded, and said that he had seen a simple matter to put in a contrivance to keep the water out. The committee adjourned *sine die*.—*Liverpool Courier*.

**WATERWORKS, ABERGAVENNY.**—The members of the Urban District Council visited, recently, the site of their water works to inspect alterations, &c. In 1850 the water was conveyed direct to the town in pipes. In 1880 the old commissioners constructed a tank with a capacity of 60,000 gallons,

and in 1897 another tank of like dimensions was commenced, and has now been completed. The work has been carried out by the Town Surveyor, Mr. J. Haigh.

**WATERWORKS, GORLEY, LANCASHIRE.**—At a meeting of the Tordornston Town Council, held on the 20th ult., it was resolved to appoint Mr. G. F. Deacon, C.E., as engineer for the new waterworks to be constructed at Gorley.

**WATERWORKS, MORPETH, NORTHUMBRIA.**—On the 27th ult. the new reservoir, filter beds, and other additions to the Morpeth Corporation Waterworks were opened. The cost of the works has been about 5,000. Mr. Dinning was the engineer, and Mr. Carr was the contractor.

## STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW, GLASGOW FREE CHURCH COLLEGE.**—A memorial window to Professors Candlish and Drummond, which has been erected in the grand staircase of this college, was unveiled by Professor Bruce on the 10th ult. The window occupies the south wall of the grand staircase, is in three lights, and is 18 ft. high. The subject runs through all the three openings. The subject runs has been executed under the direction of Mr. John J. Burnet, A.R.S.A., and from designs drawn by Mr. David Gauld, by Messrs. J. & W. Guthrie & Andrew Wells, Limited.

**WINDOW, WESLEYAN CHURCH, JESMOND, NEWCASTLE.**—The stone-work of a new window, designed by Mr. J. W. Taylor, architect, of Newcastle, has just been completed in Jesmond Wesleyan Church, and Messrs. Wailes & Strang have been chosen as the artists to fill the window with stained glass.

## FOREIGN.

**FRANCE.**—M. Falguère has just finished the model of the monument which is to be erected to the memory of Alphonse Daubert. The *Direction des Beaux Arts* is very shortly going to place the four large compositions by Puvion de Chavannes in the Pantheon. They represent scenes in the life of St. Genevieve. There will then only remain four pictures of less importance, which are to be placed in the frieze above. These have been left unfinished by the artist, but are in a sufficiently advanced state to be completed by one of his pupils. M. Vacherot, Chief Gardener of the City of Paris, has completed his plans for the gardens of the 1900 Exhibition. They will not be confined to the Champ de Mars, but will include the Esplanade des Invalides, and the underground station at the Invalides will be quite hidden. M. Gérôme has just finished the model of the monument which the Municipality of Chantilly wish to erect, in memory of the Duc d'Aumale, in the grounds of the Chateau. On Sunday last a new railway station was inaugurated, beside other new buildings, at Arras. The Municipality of Pontoise have opened a competition for plans for a new savings bank. MM. Cavet & Foucault have been appointed Sectional architects to the Paris Municipality, in place of MM. Gion & Aubertin who are retired, and now occupy the position of honorary architects. An American Committee has been formed to erect a monument in Paris to the memory of Lafayette. The excavations in progress at Timaga, in Algeria, under the direction of M. Albert Ballu of the "Monuments Historiques," have resulted in the discovery of the remains of a temple dedicated to Jupiter, Juno, and Minerva, a public building with some figure-subjects in mosaic, and a large building outside the walls, supposed to have been Therma.

## MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Mr. Spencer Chadwick, architect, has entered into partnership with Mr. Philip E. Pliditch, and their practice will be carried on at 2, Pall Mall East, under the style of Pliditch, Chadwick, & Co.

**ELECTRIC LIGHTING IN MANCHESTER.**—On the 24th ult. Major-General H. Darley Crozier, R.E., an Inspector of the Local Government Board, held an inquiry at the Manchester Town Hall into an application by the City Council for sanction to borrow 200,000, for the purposes of electric lighting in the city and outside districts. The inquiry was attended by Mr. C. H. Worthington, City Electrical Engineer, and others. Mr. Hudson (Deputy Town Clerk) said the electrical undertaking had been in existence a little over five years. At the present time there were 21,490 five-candle lamps connected, and 31,760 lamps waiting to be connected. The Corporation would not be able to connect those lamps until plant which had been authorised by the Local Government Board, and was now being constructed, had come into operation. The charges for electrical current were 5d. per unit fixed charge, and for long hours consumers 14d. per unit, and 7d. per annum per kilowatt. During the few years and eight months that had elapsed from the initiation of the undertaking until March last, the Corporation Electricity Committee placed to reserve and renewal funds 34,245, and handed over to the city fund 20,694, making a total of 60,939, which, for the period over which it extended, was equal to a rate

of rather more than a penny in the pound. That indicated that the electric undertaking of the Corporation had been a marked success.

**PROTECTION OF BUILDINGS FROM FIRE.**—A novel feature in connexion with the meeting of the various fire brigades to take part in the Lord Mayor's procession will be the delivery of a lecture to firemen on "Fire and Fire Extinction," by Professor Vivian B. Lewes. The lecture is to be given at the London Institution, Finsbury-circus, at 5 p.m., on November 8, the day preceding that on which the procession takes place, and will be illustrated by numerous experiments. We understand that Captain Shean, of 18, Finsbury-circus, E.C., is undertaking the work of organisation, and is prepared, upon the receipt of a stamped and directed envelope, to forward tickets gratis to those in any way interested professionally in the protection of buildings from fire.

**NEW PULPIT AND WINDOW, ACOMB, YORKSHIRE.**—The Archbishop of York which have been placed in the Parish Church of Acomb, near York. The lectern and gas brackets are of brass. Messrs. Earp & Hobbs, of London and Manchester, have executed the work. The window, of stained glass, occupies a position in the north aisle just to the right of the pulpit. It is lancet-shaped, and the subject portrayed is the Ascension. This work has been executed by Messrs. Lavers & Westlake, of London.

**OPEN SPACES.**—The Paddington and Hampstead Vestries have voted, respectively, sums of 500, and 10,000, towards the purchase-moneys, about 41,000, for acquiring the Golden Hill Estate, adjoining the road which skirts the Hampstead Heath between North End and Child's Hill. It is proposed that the London County Council should convert the house for purposes of a natural history and botanical museum, in respect of their technical education work, and retain the garden and rosary as a botanical garden for the use of students and the general public. The contributions include those by the Council, 12,000; Middlesex County Council, 500; and the City of London Parochial Church Fund, 1,250. A movement is a-foot for securing some land at Lee, in Kent, including the Manor House and its grounds. A playground is being laid out in Kipling-street, behind Guy's Hospital, and steps are being taken for securing some ground as a public park on the Thames side near the outfall of the river Wandle. We read, too, that the Duke of Bedford has informed the St. Giles's District Board of Works of his intention to clear the sites of Southampton-mews and Montague-mews, Russell-square, where the leases will very soon expire, and convert the ground into a garden for the enjoyment of his tenants in the vicinity.

**GLASGOW BUILDING TRADES EXCHANGE.**—The fourth annual meeting of the building trades of Glasgow and district was held on the 26th ult., in the rooms of the Exchange, Colonel Bennett presiding. The Secretary read the annual report by the executive. The past year, it stated, had been successful. The income had been 822, 3s. 1d., and the expenditure 672, 12s. 7d., leaving a net credit balance on the year's working of 149, 10s. 6d., from which a 5 per cent. dividend would be paid. During the year the membership had been increased by 34. With reference to the Workmen's Compensation Act, the questions of forming a company and of getting specially low terms from insurance companies had been discussed, and it was decided to wait at least a year in order to see the nature of the risks to be faced. The Chairman moved the adoption of reports, and Mr. Shaw seconded. Mr. Goldie expressed himself as against a licence being procured for the premises. He also called attention to what he called the severe punishment builders had to submit to by measurers. They might perhaps finish a job which had been going on for years, and they could not get their money for months. They grumbled individually, but that would do no good; the Exchange should take the matter up. The Secretary said the matter had been before the executive, and a conference had been invited of delegates from the various masters' associations. The Chairman said that the hanging up of measurements for three, six, twelve, and eighteen months was beyond a joke. He thought there ought to be a clause in contracts allowing them 5 per cent. after three months from the finish of a contract. The reports were adopted, and the executive, officers, auditors, officials, &c., were re-elected.

**PETERBOROUGH BRICK TRADE.**—The brick industry around Peterborough was perhaps never, says the *Peterborough Advertiser*, in a more prosperous condition than at the present time, the output never greater, and the demand never keener. Among the leading firms represented at a recent meeting of brickmakers served by the Great Eastern Railway system, held to consider the question of railway rates, were Beeby's Brick Company, Peterborough; Bray & Co., Peterborough; F. Jewson, Earith; T. & M. Plowman, Peterborough; and Edmondson; and Thoday & Co., Cambridge. Mr. E. Jewson, J.P., was voted to the chair, and detailed the result of the interviews that had taken place with Sir William Birt at Liverpool-street Station, on three different occasions, and which culminated in a proposal to pay an additional 1d. per thousand upon the rates quoted. This proposal the chairman considered to be a just and equitable one, and said it



only remained for brickmakers generally to accept the terms offered, and they would be carried into effect. On the other hand, the rate was not compulsory, and brickmakers could continue to pay actual weight if they so preferred. The proposals met with the general acceptance of the meeting.

**THE EDINBURGH BUILDING TRADES EXCHANGE.**—The first annual meeting of the shareholders of the Edinburgh Building Trades Exchange was held in the rooms at Shandwick-place, on the 26th ult., Mr. Peter Lawrence, surveyor, Chairman of the Company, presiding. The Chairman said the venture was a new one, and it had so far proved very satisfactory, as it had enabled them to pay a dividend of 5 per cent. That did not exhaust their resources, because they had a lucrative source of income from the catalogue which was being prepared, and which would enable them to pay a larger dividend next year. The Exchange was founded to weld together the different branches of the building trade and the manufacturers. They had learned their lesson from America, not directly, but through Glasgow, where an Exchange was started on most successful principles. Since then Exchanges have been formed in Newcastle and Halifax, and he believed that in the course of time all the other great building centres in the country would see that it was to their advantage to have a place like theirs, where the builders could meet together with the manufacturers and discuss matters in which they were interested. The membership was increasing, and what they desired was that the members should take advantage of the rooms provided for them in their present premises in order to interchange views. In olden times there used to be home-and-corner work among builders, but that had disappeared, and they wanted to meet to consider what wages they should pay their men, and what prices should be given for their work. The Directors had also under consideration the question of insurance, in view of the Employers' Liability Act, and it had been remitted to a Committee to consider whether a federation of the building trades in Scotland, or of Edinburgh, could not be formed for the purpose of insuring themselves against accidents. Sir Thomas Gibson-Carmichael, M.P., Hon. President of the Association, in moving the adoption of the report, said the Exchange had done a great deal to fulfil the ideals with which it started. It was a most useful institution to the trade of Edinburgh, and he trusted it might become of even greater use in the future. Mr. Colin Macandrew seconded the motion, which was unanimously agreed to. Directors were afterwards appointed.

**HOME ARTS AND INDUSTRIES ASSOCIATION.**—The training classes held by this Association for voluntary teachers and others, at the Royal Albert Hall, have now opened for the autumn session. Bookbinding and leather embossing, carpentry and carving, inlay and marquetry, metal repoussé, and basket making, &c., are taught. Particulars can be obtained from the secretary.

**NORTHERN COUNTIES' FEDERATED BUILDING TRADE EMPLOYERS.**—The quarterly meeting of the Northern Counties' Federation of Building Trade Employers was held at the Royal Hotel, South Shields, on the 27th ult. The President, Mr. Walter Lowry, presided. There was a large attendance of representatives from various parts, who were welcomed by Mr. Shewan, President of the South Shields Association. It was mentioned that the formation of the National Federation of Building Trade Employers was advancing in a most satisfactory manner. It was decided to hold the annual meeting at West Hartlepool in January next. After the meeting the representatives were entertained by the South Shields Master Builders' Association.

**SCOTTISH BUILDING TRADES FEDERATION.**—The fourth annual meeting of this Federation was held in Edinburgh on the 27th ult., Mr. J. B. Hay, builder, Dundee, President, in the chair. The report of the Executive, which was submitted by the secretary, Mr. James L. Selkirk, Glasgow, set forth the principal matters which had engaged their attention during the year. These included the formation of branches of employers in various towns not already organised, the starting of a monthly trade organ, the forming of a Federation insurance company, and the initiating of a special fund to meet important emergencies that may arise from time to time. The progress of the Federation during the year was regarded as most encouraging, and an earnest desire was expressed that many additional towns and districts would be organised during the next year. Thereafter members of the Executive were elected in room of those retiring, with Mr. James Leslie, contractor, Aberdeen, as President; Messrs. Thomas Kay, Wright, Glasgow, and Alexander Beveridge, builder, Perth, Vice-Presidents; and Mr. James L. Selkirk, Glasgow, Secretary and Treasurer.

**THE CHRISTINA ROSSETTI MEMORIAL.**—On the 1st inst. at Christ Church, Woburn-square, the Bishop of Durham dedicated a memorial to the late Christina Georgina Rossetti, the poet. The memorial consists of a retables containing paintings of Our Lord and the four Evangelists. The paintings were designed by Sir Edward Burne-Jones and partly executed by him, being completed by his pupil and assistant, Mr. F. Rooke. The retables itself was designed, it is stated, by the Rev. Glendinning Nash, the vicar.

## CAPITAL AND LABOUR.

**PETERHEAD MASONS' AND THEIR WAGES.**—There is a good deal of building going on in Peterhead just now, and those in the mason trade are at present agitating for a rise of wages. The agitation is being conducted through the local branch of the Operative Masons' Society, which was formed fully six months ago, and which now embraces practically all those locally engaged in the trade. The present wages are at the rate of 7d. per hour, and some time ago a demand was made on the masters to increase the wages as from November 1 to 8d. an hour, the same as the standard rate paid in Aberdeen. The masters are understood not to be disposed to give this increase, and have asked an extension of time. A meeting of the operatives' branch was held on the 22nd ult.—Mr. George Milne, President, in the chair—to consider what reply should be given to the masters. It is understood that a motion was made, that a rise to 7½d. should take place on November 1, and a rise to 8d. on February 1. An amendment was, however, moved, that the rise to 8d. should take place on November 1. On a vote, the amendment was carried by a large majority.—*Aberdeen Free Press.*

## LEGAL.

### AN EXPERT WITNESS AND HIS FEES.

The case of Hudson v. Miller came before Mr. Justice Ridley in the Division of the Queen's Bench, it being an action brought by Mr. Hudson, of Messrs. Wigg, Oliver, & Hudson, surveyors, for 80l. 7s. fees alleged to be due for professional services claimed in respect of attendance and evidence given by the plaintiff in the course of litigation between the defendant and the London County Council, which took place in 1895. The defendant's claim in that litigation was in respect of damage done to premises owned by him in Stoke Newington, in consequence of the removal of adjoining buildings by the County Council. The amount claimed was 250l., which was subsequently reduced to 110l. The matter was referred to arbitration, and in the result the defendant recovered 17l. 10s., with costs on the County Court scale. The defendant's case was that the plaintiff's charges were grossly excessive; and further, that an agreement was made by which the plaintiff consented to identify himself with the claim in respect to the extent of his fees, a minimum of 10l. 10s. being guaranteed him.

Mr. Justice Ridley found that no such agreement was made as was alleged by the defendant, but he reduced the claim to 70l. Judgment accordingly.

### THE WORKMEN'S COMPENSATION ACT.

At the Liverpool County Court, on the 26th ult., his Honour Judge Collier gave judgment in an action under the Workmen's Compensation Act. The claimant was Mrs. Lucy Powell on behalf of herself and her three children, and she sought compensation from Messrs. Brown and Blackwood, builders and contractors, Liverpool, for the death of her husband, William Powell, who was a carter in the employ of the defendants. The case was argued before his Honour recently, when several important points were raised as to the construction of the Act. Dr. Thomas was counsel for the applicant, and Mr. Tobin was counsel for the defendants. It had been agreed that if the plaintiff was held to be entitled to recover the amount should be 243l. 12s. 7d. The defendants occupied premises which, it was alleged, were a factory within the meaning of the Act, and one question which arose in the case was whether deceased met with his death in the course of his employment on, in, or about the factory. The deceased was engaged in loading timber on to his cart from the defendants' premises, his cart being in the road outside, when he missed his footing and fell from the cart to the ground, sustaining injuries to his spine which resulted in death shortly afterwards. Counsel submitted that the man was in the course of his regular employment when he met with his fatal injury, and also that, if not actually on the factory premises, he was "about" them within the meaning of the Act. Mr. Tobin submitted that it was mere guesswork to say that the accident arose out of the employment, because no one saw the deceased until he had fallen. Counsel suggested that the fact was likely to have been caused by giddiness, in which case he contended the defendants were not liable. He argued that the Act did not apply to the deceased's employment, and that the defendants' entire works could not be constituted a factory within the meaning of the Act, though parts of them might come within that definition. The spot where the accident happened, he submitted, was not "in, on, or about" the defendants' premises within the meaning of the Act.—In delivering his reserved judgment, his Honour said he held that the respondents' premises in Chatham-street were a "factory" within the meaning of the Workmen's Compensation Act, 1897. The fall appeared to him purely accidental, and one which the respondents could not have prevented in any way, and for which,

but for the Workmen's Compensation Act of 1897, they would not have been liable legally, equitably, logically or morally; but the question was whether the respondents were liable under the Workmen's Compensation Act, 1897. The accident was clearly not attributable to any "serious or wilful misconduct" of Powell, and therefore the exception mentioned in the Act might be disregarded. He found that the accident arose "out of" the employment of the deceased, and it therefore remained to be considered whether his employment was one to which the Act applied. Powell, in his view, was clearly employed in a factory, and it did not seem to him to be material that the cart was standing, at the time of the accident, in the street outside the factory. In his view it was covered by the word "about" in section 7, sub-section 1 of the Act. He also thought it would be within the meaning of the word "plant" in a definition of "factory" in the same section, sub-section 2. On the construction of the Act, therefore, he thought that Mrs. Powell was entitled to the compensation she sought, and he would make his award accordingly.

The application of defendants' counsel, his Honour gave leave to appeal, and granted a stay of execution.—*Liverpool Mercury.*

## MEETINGS.

### FRIDAY, NOVEMBER 4.

**Architectural Association Discussion Series.**—Messrs. F. M. Elgood, A. R. Tennet, and H. V. Lanchester, on "Modern Architectural Tendencies, as Illustrated by Contemporary Work." 7 p.m.  
**Sanitary Institute (Lectures for Sanitary Officers).**—Dr. H. R. Kenwood on "Infectious Diseases and Methods of Disinfection." 8 p.m.  
**Glasgow and West of Scotland Technical College (Lectures for Sanitary Officers).**—Mr. W. Vicars on "Decorative Stone Work." 8 p.m.  
**Perth Architectural Association.**—Opening address of the session: Mr. Alexander McGibbon on "Tradition and Material in Architecture." 8 p.m.

### SATURDAY, NOVEMBER 5.

**Sanitary Institute (Demonstrations for Sanitary Officers).**—Inspection at the Southwark and Vauxhall Water Works, Hampton.  
**British Institute of Certified Carpenters.**—Visit to the "Carlton Hotel." 3 p.m. Meeting at Carpenters' Hall. 6 p.m.  
**Sanitary Inspectors' Association.**—Extraordinary General Meeting. Joint address by Mr. T. J. Moss Flower, C.E., Chairman of Council. 5 p.m.

### MONDAY, NOVEMBER 7.

**Royal Institute of British Architects.**—First General Meeting (Ordinary) of the session. Professor Alchison, F.R.S., President, will deliver an opening address. 8 p.m.  
**London Institution.**—The Dean of Canterbury (Dr. Farrar) on "Canterbury Cathedral." Illustrated. 5 p.m.  
**Sanitary Institute (Lectures for Sanitary Officers).**—Mr. A. S. E. Ackermann on "Principles of Calculating Areas, Cubic Space, &c.; Interpretation of Plans and Sections to Scale." 8 p.m.  
**Society of Engineers.**—Mr. Perry F. Nursey on "The Preparation of Rhea Fibre for Textile Purposes." 7.30 p.m.  
**Liverpool Architectural Society.**—Dr. John W. Hayward on "Construction of Hospitals for Consumptives." 6 p.m.

### TUESDAY, NOVEMBER 8.

**Northampton Institute, Clerkenwell (Lectures on Architecture).**—Mr. F. Bond on "Curvilinear and Flamboyant." 8 p.m.  
**Institution of Civil Engineers.**—Professor W. C. Roberts on "Extraction of Nickel." 8 p.m.  
**Auctioneers' Institute.**—Mr. Alexander Macmorran, O.C., on "The Effect of Recent Decisions on the Liabilities and Rights of Owners in Respect of the Drainage of Buildings." 7.45 p.m.

### WEDNESDAY, NOVEMBER 9.

**Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).**—(1) Inspection at East London Soap Works, Bow, E.C., 3 p.m. (2) Dr. Joseph Priestley on "Ventilation, Warming, and Lighting." 8 p.m.

### THURSDAY, NOVEMBER 10.

**Carpenters' Hall, London Wall (Even Lectures on Building and Sanitary Construction).**—Mr. James Barry, &c., on "Setting Out Work and By-laws." 7.30 p.m. 5 p.m.  
**Institution of Electrical Engineers.**—Professor Silvanus P. Thompson, D.Sc., F.R.S., on "Rotary Converters." 8 p.m.

### FRIDAY, NOVEMBER 11.

**Architectural Association.**—Mr. H. Wilson on "Arts and Crafts." 7.30 p.m.  
**Sanitary Institute (Lectures for Sanitary Officers).**—Professor Robert Smith on "Sanitary Building Construction." 8 p.m.

### SATURDAY, NOVEMBER 12.

**Sanitary Institute (Demonstrations for Sanitary Officers).**—Inspection at Richmond Main Drainage Works, Mortlake. 3 p.m.  
**Institution of Junior Engineers.**—Visit to the King William-street Station of the City and South London Railway extension works. 3 p.m.

## RECENT PATENTS:

### ABSTRACTS OF ACCEPTED SPECIFICATIONS.

#### Open to opposition until December 12.

[1897] 12,465.—MANUFACTURE OF CEMENT: F. D. Cummer.—The method consists in mixing with liquid slurry a certain proportion thereof in dried and pulverised state so as to form a plastic material, containing 36 per



Reversion in 67 yrs. (in lots) ..... 1,210



By R. TIDY & SON.		39, Castle-rd., u.t. 364 yrs. g.r. 61, c. 481.	£145	68 to 74 (even), Shrubbery-rd., u.t. 91 yrs. g.r.	£540
Highbury,—707, Highbury New-n., u.t. 51 yrs.	£1,000	35, Patshull-rd., u.t. 62 yrs. g.r. 64, c. 481.	535	161.	500
g.r. 61, c. 906.		6, Alma-st., u.t. 254 yrs. g.r. 56.	245	Enfield Highway—1 to 20, Brimsdown-cottages,	
De Beauvoir Town—96, Buckingham-rd., u.t. 264		By WOOD, FURNESS, & CO. (at Brentford).		u.t. 89½ yrs. g.r. 52, 108.	
g.r. 54, c. 384.	355	Brentford—10, Bevis-lane, u.t. 394. 108.	500	Full Sutton, Yorks.—Freehold farmhouse and	5,600
By ALFRED G. BELL.		140, High-st., c. 261.	100	203 a, 2, 3, 4 p.	
Shafesbury Avenue—50, Denmark-st., u.t. 65 yrs.		The Ham, freehold building, r. 206, 228.	105	<i>Conversions used in these lists for free-</i>	
g.r. 50½, c. 250½.	930	By ALFRED RICHARDS (at Tottenham).		ground-rd. 1. for leasehold ground-rd.; i. g. r. for	
By Wm. J. BELL.		Tottenham—4, 5, 6, 7, Fainton-st., u.t. 74½ yrs.	375	improved ground-rd.; g. r. for ground-rd.; r. for rent;	
Baywater—211, 213, and 215, Westbourne-grove,		g.r. 10½.	325	for freehold; c. for cophold; 1. for leasehold; c. for	
u.t. 44 yrs. g.r. 22½, 18, r. 150.	£3,540	23 to 41 (odd), and 41a, Chinton-rd., u.t. 91 yrs.	1,735	estimated rental; a. for terrace; r. for road; s. for	
49, Artesian-rd., u.t. 47½ yrs. g.r. 54, r. 384.	170	g. r. 44½.		square, p. for place; t. for terrace; cres. for crescent;	
By ALFRED G. BELL.		63 to 65 (odd), Shrubbery-rd., u.t. 91 yrs. g.r.	1,600	y. d. for yard, &c.	
Kensith Town—53, Clarence-rd., u.t. 40 yrs. g.r.	345	153 (odd), Shrubbery-rd., u.t. 91 yrs. g.r.	1,600		
54, c. 366.		Shrubbery-rd., &c., two plots of building land, f.	150		







**SWADLINCOTE**—For erection of shops and bakery at High-street, for Mr. B. Goodhead. (Ovens not included.) Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect.—  
 Lowe & Sons ..... £1,950  
 E. Clarke ..... 1,950  
 G. Hodges ..... 1,950  
 H. Edwards ..... £1,950  
 R. Kershaw\* ..... 1,950  
 \*Accepted.

**TAIVISTOCK**—For the execution of drainage works, Yelverton Mr. Geo. D. Bellamy, C.E., 64, Courtenay-street, Plymouth.—  
 G. Shadlock & Son ..... £1,500  
 A. Andrews ..... 1,500  
 P. Blower ..... 1,500  
 J. Shaddock ..... 1,500  
 Wm. Gibson ..... 1,500  
 H. Smith & Son ..... 1,500

**TOTTENHAM (Herts.)**—Accepted for the erection of a bridge, and other works in connection therewith, over the Tottenham Ford, for the Hertford County Council. Mr. Urban A. Smith, County Surveyor, 41, Parliament-street, Westminster, S.W. 1.—  
 Geo. Bell, Tottenham ..... £54

**WALLINGFORD**—For the superstructure of new buildings at the Berkshire Asylum, near Wallingford. Mr. George T. Hine, architect, Westminster. Quantities by Mr. L. A. Francis.—  
 R. Curtis ..... £20,000  
 H. Lovatt ..... 20,000  
 T. H. Kingerlee & J. Parnell & Son ..... £24,474  
 Sons ..... 24,474  
 Benfield & Loxley ..... 24,474  
 McCarthy & Pitt ..... 24,474  
 \*Accepted.

**WANSTEAD (Essex)**—For the erection of a school (one story) and a caretaker's cottage on the Colbold-road site, for the Wanstead School Board. Mr. John T. Bressy, architect, 70 and 71, Bishopgate-street, W. 1.—  
 H. R. Rens ..... £10,885  
 Walter Lawrence ..... 10,885  
 James Smith & Sons ..... 10,885  
 Harris & Wardrip ..... 10,885  
 S. J. Scott ..... 10,885  
 William Smith & Son ..... £15,955  
 V. Y. Kiddle & Son ..... 15,955  
 F. J. Coshall ..... 15,955  
 Alfred Reed & Son ..... 15,955

**WEYBRIDGE**—For the erection of a convent of the Infant Jesus, for the Dames de St. Maur, de St. David, architect, 10, Glenelagh-road, Streatham. Quantities by Messrs. Thompson & Waller, surveyors, 20, Glasshouse-street, Piccadilly-circuit.—  
 Patman & Forthright ..... £7,743  
 Brown & Son ..... 7,743  
 Nightingale ..... 7,743  
 Badcock & Moxey ..... 7,743

**WINDSOR**—For the erection of a residence and stabling, Bolton-road, Windsor, for Mr. A. W. Benson. Messrs. F. J. Garton & Summerhill, architects, Windsor.—  
 W. Satchwell, Egham ..... £4,650  
 [Amended estimate.]

**WINDSOR**—For new entrance gateway to the "White Hart" Hotel, Windsor, for Mr. J. C. Lake. Messrs. Treadwell & Martin, architects, 2, Waterloo-place, S.W. Quantities by Mr. H. Williams Melior, 17, Buck-church-street, Adelphi, W.C.—  
 Watson, Ascot ..... £505

**WINDSOR FOREST**—For the erection of a billiard room, Cranborne Hall, for Mr. James Foster. Mr. A. Henley Attwater, architect, 16, Craven-street, W.C.—  
 W. Satchwell, Egham ..... £750  
 [No competition.]

#### LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders:—

**BETTS-STREET**—Refitting boys and female infants' offices, rearranging and refitting male infants' offices, erecting girls' offices in new position on roof playground, and new drainage scheme.—  
 W. Greig & Son ..... £5,734  
 G. Munday & Sons ..... 5,734  
 G. S. S. Williams & Son ..... 5,734  
 Dove Bros. ..... 5,734  
 E. Parsons & Co. ..... 5,734  
 L. H. & R. Roberts ..... 5,734  
 Johnson & Co. ..... 5,734  
 E. Triggs ..... 5,734  
 T. Gregory & Co. ..... 5,734

**SURREY-LANE**—Erecting deaf centre for boys and girls (48), providing water-closets and covers playground, and enclosing, draining, and tarping the additional land.—  
 F. & H. Higgs ..... £4,400  
 J. Carmichael ..... 4,400  
 J. Garrett & Son ..... 4,400  
 J. & M. Patrick ..... 4,400  
 E. Triggs ..... 4,400  
 T. Gregory & Co. ..... 4,400

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT,  
 TEAK, VENEER, and TIMBER MERCHANT  
 Nos. 7, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
 HATTON GARDEN, and 29, RAY STREET,  
 FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
 THICKNESS, DRY, and FIT FOR IMMEDIATE USE.  
 Telephone, No. 274 Holborn. Telex Address "SNEWIN" London.

**GLOUCESTER-ROAD**—Erecting special school.—  
 J. N. T. T. ..... £2,300  
 Holiday & Greenwood ..... 2,300  
 E. F. Bulled & Co. ..... 2,300  
 J. Smith & Sons ..... 2,300  
 F. & H. F. Higgs ..... 2,300  
 A. White & Co. ..... 2,300

**VALLEY-ROAD**—Removing three iron buildings and apparatus from the Craven-street site, and re-erecting two of the buildings and apparatus upon this site, and stacking the third building.—  
 J. N. T. T. ..... £1,650  
 Humphreys, Limited ..... 1,650  
 W. Harbrow ..... 1,650  
 J. & W. T. Hunter\* ..... 1,650  
 \*Recommended for acceptance.

**WHITE LION-STREET**—Enlargement—Boys, 104; girls, 111; infants, 123; total, 238. Providing halls for all departments; removing existing and providing new staircases and cloak rooms for boys and girls; teachers' rooms and lavatories for all departments; re-sealing, stopping and improving lighting of existing class-rooms; providing playground on roof of new enlargement for girls; providing new water-closets for all departments; removing present schoolkeeper's house and leaving one existing house on site for use of schoolkeeper; providing new drainage scheme, and enclosing and tarping the additional land.—  
 G. Munday & Sons ..... £16,822  
 F. & H. Wood ..... 16,822  
 G. S. S. Williams & Son ..... 16,822  
 Chesson & Sons ..... 16,822  
 J. Grover & Son ..... 16,822

#### TO CORRESPONDENTS.

**B. H. & Co.** (Amount should have been stated)  
**NOTE**—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
 We cannot undertake to return rejected communications.  
 Letters or communications beyond more news items which have been duplicated for other journals are NOT DESIRED.  
 We are compelled to decline pointing out errors and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

#### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum (25 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., at 15s. per annum, Remittance payable to DOUGLAS FOURDRIER should be addressed to the publisher of "THE BUILDER," No. 41, Catherine street, W.C.  
 SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 10s. per annum (25 numbers) or 4s. 6d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

## HIGH-CLASS JOINERY, LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,  
 GREENHOUSES,  
 WOODEN BUILDINGS,  
 Bank, Office, & Shop Fittings.  
 CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## THE BATH STONE FIRMS, Ltd.

BATH,  
 FOR ALL THE PROVED KINDS OF  
 BATH STONE.

FLUATE, for Hardening, Waterproofing,  
 and Preserving Building Materials.

## HAM HILL STONE DOULTING STONE

The Ham Hill and Douling Stone Co.  
 (Incorporating The Ham Hill Stone Co. and C. Trask & Son,  
 The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-Ham,  
 Somerset.

London Agent:—Mr. E. A. Williams,  
 16, Craven-street, Strand.

**Asphalts**—The Seyssel and Metallic Lava  
 Asphalt Company (Mr. H. Glenn), Office, 42,  
 Poultry, E.C.—The best and cheapest materials for  
 damp courses, railway arches, warehouse floors,  
 flat roofs, stables, cow-sheds and milk-rooms,  
 granaries, tun-rooms, and terraces. Asphalts  
 Contractors to the Forth Bridge Co.

## SPRAGUE & CO.'S, Ltd.,

INK-PHOTO PROCESS,

4 & 5, East Harding-street,  
 Fetter-Lane, E.C. [ADV]

## QUANTITIES, & CO., LITHOGRAPHERS

accurately and with despatch.  
**METCHAM & SON** (at 40, PRINCES STREET,  
 "QUANTITY SURVEYORS" DIARY AND TABLES,  
 For 1899 will be ready shortly. [ADV]

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

SLATES, SLABWORK,  
 Enamelled Slate,  
 Marble,  
 Permanent Green Slates.

WORKS:

Bow, London, E. and  
 Aberliffeany, North Wales

BRANCH HOUSE:

37, Victoria-street, Bristol.

## PILKINGTON & CO.

(ESTABLISHED 1838),

MONUMENT CHAMBERS,

KING WILLIAM STREET, LONDON, E.C.

Telephone No. 2751 Avenue

Registered Trade Mark,

## Polonceau Asphalte

PATENT ASPHALTE and FELT ROOFING.  
 ACID-RESISTING ASPHALTE.

WHITE SILICA PAVING

SEYSSSEL ASPHALTE.

# W. DUFFY'S PATENT IMMOVABLE ACME

# WOOD BLOCK FLOORING.

THE PERFECT FLOORING FOR ALL PURPOSES.

Seven Gold Medals, four Silver, two Bronze Medals, and Certificate of Sanitary Institute of Great Britain

Full Particulars and Prices on application to

## THE ACME WOOD FLOORING COMPANY, LTD.

Chief Offices and Works: Gainsborough Road, Victoria Park, London, E.R.



## ILLUSTRATIONS.

The Government House, Rangoon.—Mr. H. Hoyle Fox, A.R.I.B.A., Architect .....	Two Single-Page Tone-Blocks.
The Dining Room, Paddockhurst.—Mr. Aston Webb, F.R.I.B.A., Architect .....	Double-Page Ink-Photo.
Detail of End of Dining Room, Paddockhurst.—Mr. Aston Webb, F.R.I.B.A., Architect .....	Double-Page Ink-Photo.
Proposed Town Hall, Godalming: Selected Design.—Messrs. Lanchester, Stewart, & Rickards, Architects .....	Double-Page Ink-Photo.

## Blocks in Text.

Design of Stained Glass: "St. Cecilia" .....	Page 428	Government House, Rangoon. Plan .....	Page 437
Model By-Laws and Local Requirements .....	Page 436		

## CONTENTS.

Disinfecting Stations .....	421	Sanitary Inspectors' Association .....	433	on the Crafts: "John P. Seddon's "King René's Honeymoon Cabinet" .....	434
New Observatory: A Historical Sketch .....	422	Liabilities and Rights of Owners in Respect of the Drainage of Buildings .....	433	Trade Catalogues .....	436
Notes .....	423	London Building Act, 1894 .....	434	Books Received .....	436
The Royal Institute of British Architects .....	424	West of England Building Trade Employers .....	434	Godalming Town Hall Competition .....	436
Singapore Town Hall and Theatre Competition .....	427	Books: Rev. P. Deamer's "Wells, the Cathedral and See;" Austin T. Byrne's "Inspection of the Materials and Workmanship Employed in Construction;" Frank Latham's "The Sanitation of Domestic Buildings;" Dr. Lassar Cohen's "Chemistry in Daily Life;" C. T. Kingzett and D. Homefray's "A Pocket Dictionary of Hygiene;" "Electrical Installation Rules;" E. A. P. Bur's "Guide to Round Timber Cubing Rule, and Round Timber Measurement Weight Tables for Railway Rates;" Frederick C. Webber's "Carpentry and Joinery;" "Catalogue of Works Exhibited by Members of the Northern Art Workers' Guild, Manchester with Chapters	428		
Engineering Societies .....	427			Model By-Laws and Local Requirements .....	436
"St. Cecilia" Design for Stained Glass .....	428			The Student's Column.—Sound, Light, and Heat.—XIX .....	437
Magazines and Reviews .....	428			General Building News .....	437
Archaeological Societies .....	429			Sanitary and Engineering News .....	440
The Metropolitan Asylums Board .....	429			Stained Glass and Decoration .....	440
The Architectural Association Discussion Section .....	430			Foreign .....	440
The London County Council .....	431			Miscellaneous .....	443
The Government House, Rangoon .....	432			Capital and Labour .....	443
Dining-room, Paddockhurst .....	433			Legal .....	443
New Town Hall Godalming .....	433			Meetings .....	443
				Recent Patents .....	443

## Disinfecting Stations.



ARCHITECTS and Borough Surveyors will probably find the most useful portion of Dr. Rideal's treatise on "Disinfection and Disinfectants" to be that part of

Chapter III. which deals with the building and equipment of public disinfecting stations; but there are other chapters on sanitary practices and sanitary law which of themselves will render the work a valuable addition to the architect's library. The inclusion of a plate of the drawings, by Mr. Rowland Plumble, of the disinfecter house and incinerator at St. Mary's, Newington, also enhances the value of the book; for although, as Dr. Rideal points out, this building has had to be adapted to its environments, yet it is a fairly representative disinfecting installation of the most modern type.

In a town built on a sanitary site, with ideally perfect sanitary arrangements and surroundings, and inhabited by a cleanly and intelligent people, the necessity for the use of disinfectants and disinfecting processes would be reduced to a minimum; but, unfortunately, no such town exists, and the necessity for counteracting and destroying as far as possible the baleful products resulting from overcrowding, from ignorance and apathy regarding the laws of health, and even from open uncleanness, has raised the art of disinfecting, or destroying disease-producing germs, to one of primary importance in all centres of civilisation.

It is now known that the fundamental agents in spreading contagious diseases are those minute organisms which are classed under the somewhat comprehensive term *bacteria*. Unfortunately bacteriology is but a very modern science, and much has yet to be learnt regarding bacteria in general, and regarding the characteristics of each species of bacteria in particular; and that bacteriological research is not unattended with danger has been again demonstrated quite

recently by the tragic events which have occurred in Vienna, where investigations by expert hands into the nature of the bubonic plague organisms have resulted in the accidental infection and death by plague of Dr. Müller and several attendants.

Our present knowledge of bacteriology indicates that bacteria exist in a great variety of forms, and that while some are harmless, and possibly beneficial to human life, others are mortal enemies; but until our knowledge regarding these organisms is far more extensive and complete than at present, the only safe treatment for infected matter will be complete sterilisation, destroying alike the noxious and the innocuous germs. It is with this object that all modern disinfecting methods, both physical and chemical, are employed.

During the last decade the practice of erecting public disinfecting stations in densely populated districts has been extensively spreading not only in this country, but in America and on the Continent, and the provision of at least one disinfecting chamber is now commonly required in public institutions, such as hospitals and casual wards. Figures 18 and 19 in Dr. Rideal's treatise show the arrangements described by Mr. H. Francis, of Philadelphia, as those adopted in the most modern disinfecting stations of the Marine Hospital Service of the United States Government. The arrangements are very complete, and provide for disinfection by heat, by fumigation, and by chemical disinfectants. It is worthy of notice that in the United States, when sulphur dioxide is used for fumigation, it is recommended that 3 lbs. of sulphur should be burned for every thousand cubic feet of air to be disinfected, whereas in this country it is unusual to employ more than half that quantity of sulphur for the same area; and this notwithstanding the fact that Dr. Koch and others have expressed the opinion that sulphur dioxide is of little value as a disinfectant.

As a matter of fact, when sulphur dioxide is to be employed it is commonly produced now by vapourisation of the liquefied gas. When sulphur dioxide gas is subjected to a sufficiently high pressure, it condenses to a liquid, and this liquefied gas is now sold in receptacles of various sizes. A form much used by sanitary inspectors is a cylinder containing about 20 ozs. by weight

of the liquid. The operator cuts off the lead vent pipe at the top of the cylindrical tin, and places the tin with the outlet inclined downwards in a wash-basin, so that the liquid will flow out. The liquid rapidly returns to the gaseous condition, and is commonly supposed to produce sufficient gaseous sulphur dioxide to effectively disinfect a room having an area of 1,728 cubic ft. (12 ft. cube). For the disinfection of bedding, clothes, and other portable articles it is now generally admitted that subjection under pressure to superheated steam is the best treatment; but there is still much difference of opinion as to the most suitable temperature to employ, the object being to cause complete sterilisation without in any way injuring the goods. As most of our readers are aware, the disinfecting machines most commonly used in this country are various forms and modifications of the Washington-Lyon apparatus. Some are of cylindrical shape and have an apparatus for producing a vacuum in the disinfecting chamber before injecting the steam.

"The main feature," says Dr. Rideal, "of a disinfecter house is that there shall be two rooms; one permanently kept for infected goods, and the other for disinfected goods. The machine is built in the wall dividing the two rooms, and is fitted with two doors, one door opening into each room. These doors should never be open at the same time, and there should be no direct inter-communication whatever." This is correct, but the author might also with advantage have drawn attention to the necessity, sometimes neglected, of so arranging the passages, entrances, and exits of the station that goods after disinfection need never be carried over the same ground, or through the same doorway, as that by which the infected goods are admitted.

At Newington an incinerator has been placed upon the same site as the disinfecting apparatus, and although this is not yet usually regarded as part of a disinfecting plant, it is frequently very useful for destroying by fire infected materials that are not worth disinfecting. It is, however, of great importance that the furnace should be so constructed that it is impossible for incompletely burned particles, and objectionable gaseous products of incomplete combustion, to escape up the flue into the atmosphere.

Dr. Rideal devotes considerable space to the discussion of the utility of formaldehyde

\* "Disinfection and Disinfectants," by Samuel Rideal, D.Sc. (London). Second Edition. London, 1898. The Sanitary Publishing Company, Limited. Price 12s. 6d.

(formic aldehyde or "formalin"), the disinfecting material that is now so extensively employed. He classes the methods of utilising it in the following three divisions:—


1. Spraying the walls, ceiling, and floor with the solution.
2. Atomising the vapour from a calcium chloride solution of formaldehyde under pressure in an autoclave.
3. Vaporising paraformaldehyde by means of heat in the presence of water vapour produced from the products of combustion of methylated spirits.

He then proceeds to describe the various forms of apparatus employed for its application.

In the chapter on mechanical disinfection attention is drawn to experiments which have proved that light, especially in the presence of air and moisture, is of considerable value in checking the development of bacteria. Hence bacteriology constitutes yet another witness to the value of abundance of light and air in buildings, and to the foolishness of the old tax on windows.

To the general reader the chapter on Practical Methods will probably be of most interest, although part of it is of rather a cursory nature. A considerable portion of the volume is naturally of interest to specialists only, and it is to them that the sanitary bibliography at the end of the book will be most useful. As it is well printed and lucidly written, Dr. Rideal's treatise is worthy of the rank it has obtained as the standard English work on disinfectants and disinfecting processes.

#### KEW OBSERVATORY: A HISTORICAL SKETCH.

HE Committee appointed by the Treasury to consider the desirability of establishing a national physical laboratory have reported in favour of developing the work done at Kew Observatory. They recommend that the buildings there should be improved and extended, and converted, under the Royal Society's control, into a public institution for standardising and verifying instruments, for testing materials, and for the determination of physical constants.

It is not generally known that the Observatory in the Old Deer Park was erected by George III. for facilitating observations of the transit of Venus on June 3, 1769, to observe which phenomenon Captain Cook and Sir Joseph Banks sailed in the *Endeavour* to Otaheite. Sir William Chambers was architect of the building. The ground had been cleared by razing the hamlet of West Sheen. The Observatory, distant about 350 yards from Isleworth Ferry, covers the site, in part, of the extensive buildings of the Carthusian House of Jesus of Bethlehem at Sheen, founded, together with St. Bridget's Nunnery at Sion, on the opposite shore, by Henry V. in 1414, in expiation for Richard II.'s deposition and death. Its stone superstructure rests upon vaulting built of thin and narrow red bricks of the kind found in the wall of Richmond—or, rather, Sheen—Palace, the basement being surrounded by three lines of brickwork to resist vibration. The wings of the south-west front are two floors high; the central portion has a three-sided bay and a third floor with a dome for the equatorial, now used for the photo-heliograph. The clock, by B. Vulliamy, was since deposited in the Patent

Museum, South Kensington. To Dr. S. Demainbray, first superintendent, succeeded, in 1782, his son, the Rev. S. Demainbray. George III. often visited the Observatory. A volume of the King's prints and drawings in the British Museum contains an interesting set of coloured drawings, each bearing the written signature, "James Adam, architect, 1770," of the elevation, with four plans and a section, of a "building proposed to be erected by his Majesty at Richmond for a Register of the Weather." The building, circular on plan, has a colonnade of six pillars, in pairs, with cornice and open balustrade, is 35 ft. in diameter and 43 ft. high to the roof, which carries three cupolas.

The establishment of an observatory at Kew was perhaps prompted, in the first instance, by certain precedent events. Samuel Molyneux (1689-1728), astronomer and politician, had been secretary to the Prince of Wales until his accession as George II. In 1717 Molyneux married Lady Elizabeth Capel, daughter of Algernon, second Earl of Essex, who brought him a handsome fortune, increased by her inheritance of Kew House on the death, in 1721, of her kinswoman Dorothy, daughter and heir of Richard Bennet, and widow of Sir Henry Capel, second son of Arthur, first Baron Capel, of Hadham, beheaded in New Palace-yard on March 9, 1649. Sir Henry, Lord-Lieutenant of Ireland, was created (1692) Baron Capel, of Tewkesbury, and died, *s.p.*, 1696. Evelyn visited him at Kew:—

27 Aug. [1698] . . . din'd at Mr. Hen. Brouncker's, at the Abby of Sheene, formerly a monastery of Carthusians, there yet remaining one of their solitary cells with a cross. Within this ample enclosure are several pretty villas and fine gardens of the most excellent fruites, especially Sir William Temple's (lately Ambassador into Holland), and the Lord Lisle's, sonn to the Earle of Leicester. . . After dinner I walk'd to Ham, to see the house and garden of the Duke of Lauderdale. . . Hence I went to my worthy friend Sir Henry Capel (at Kew), brother to the Earle of Essex; it is an old timber house, but his garden has the choicest fruit of any plantation in England, as he is the most industrious and understanding in it.

Evelyn records other visits in 1683 and 1688, mentions the repair of the house, and the orangery and myrtelum. Molyneux went to reside at Kew House, where he fitted up an observatory. There, in 1723-5, he and James Bradley resumed Hooke's attempts to determine stellar annual parallax, using a zenith-sector of 24 ft. radius, with a small arc and showing single seconds by a vernier, supplied by Graham. Other observations (of  $\gamma$  Draconis) made by them at Kew House in 1725-7, and continued by Bradley at Wanstead, led to the latter's two great discoveries—the aberration of light and the nutation of the earth's axis.

Molyneux's widow married the notorious empiric, Nathaniel St. André; after her death on May 27, 1730, Kew House—also known as the White House, and afterwards as the Old Palace—was leased to Frederick, Prince of Wales. George III. bought the freehold from the Capels in 1781. In 1731 Kent had made additions to the house; he designed the ornaments of the gallery, with some chimney-pieces, and painted the cabinet, drawing-room, and great staircase ceilings. In 1757-62 Chambers laid out the flat and barren demesne for Augusta, Princess Dowager of Wales, designing the old Orangery (since a museum for ligneous specimens), the several Temples, the Mosque, Alhambra, Pagoda, Gallery of

Antiques, Ruins, covered seats, and (after Palladio) the bridge to the island in the lake as described and illustrated in two of his books.\* We should cite, too, Jean Rocquere's rare surveys of 1734 and 1748, giving elevations of the Dairy House, King's Palace, at Kew House; W. Woollett's set of fine prints of White (Kew) House and the lake, with a huge swan; a view (1776) by P. Sandrart, R.A., of the Prince's House; the aquatint (1798) of White House, &c., after F. Mannskirsch; and a large-scale plan, drawn in 1771, by Peter Burrell, H.M.'s Surveyor-General. These, with many others after their kind, formerly belonged to the Royal collection.

Some repairs at Kew House were carried out by James Wyatt, who in 1802-11 erected a new palace for the Sovereign. The extraordinary structure, built for the most part of cast-iron (after his own invention patented in 1808), cost 500,000*l.*, with 500,000*l.* yearly for current repairs; it was never completed, and ultimately pulled down in 1827-8. Meanwhile Kew House was demolished (1803-4); on its site King William IV. set up a sundial, bearing an inscription which does less justice to Molyneux than to Bradley. The dial stands on the lawn in front of the "Dutch House," latterly known as Kew Palace—the "Queen's Lodge" of Fanny Burney's diary. The Dutch House, whose fee-simple was purchased for Queen Charlotte, was built for James I. on the site of the "Dairie House" by Sir Hugh Portman, a trader to Holland, cited in the Sydney Papers (1595) as "a rich gentleman that was knighted by his Majesty at Kew." This is the palace which in January last, the Queen resolved to open as a public museum attached to Kew Gardens. The pleasure-grounds of Kew House were planned by Kent and Bridgman, and further improved by Lancelot ("Capability") Brown.

Thus the Botanical Gardens at Kew, we know them, covering an area of 290 acres, had their origin and increase in the Royal garden upon which Sir Joseph Banks and the gardeners John Haverfield, W. Aiton, and his son bestowed so much care. In 1840, being then but eleven years in extent, they passed to the charge of the Woods and Forests Department, under the directorship of Sir W. Jackson Hooker. That same year the observatory was committed to the British Association for the Advancement of Science, whilst most of its contents were distributed to Armagh Observatory, King's College, and the College of Surgeons, London, the British Museum, and members of the Royal Family. Under the British Association it became the central place of observation and record of the Meteorological Committee. In June, 1871, the late Mr. J. P. Gassiot, F.R.S., presented securities to the value of 10,000*l.* in trust to the Royal Society in order that they might take over the Observatory, and there continue meteorological and meteorological observations with self-recording instruments, the late Sir Sabine taking a leading part in the scientific

\* "Treatise on Civil Architecture," fo. 1759; and "Plans, Elevations, Sections, and Perspective Views of the Gardens and Buildings at Kew," fo. 1765. Goussier designed the Temple of Confucius, and Kent the adjacent semi-octagonal seat; Sir Jeffrey Wyatville the Doric "Pavilion"; Decimus Burton the Great Palm and Winter Garden Houses, and the entrance gates, Kew Green. Sir James Fergusson was honorary architect of the gallery (1880-2) for Miss Marianne North's collection of botanical paintings.



tical operations until his death in 1883. The work now carried on at Kew is of a most multifarious character, and extends to the instruction of observers, the study of sanitation and ventilation, a record of sunspots from November, 1825, scientific photography, the verification of geographical, nautical, and other instruments, trials of watches and chronometers, and testing of thermometers, hydrometers, range-finders, sextants, &c., for our own and foreign governments. Hitherto, we understand, the institution has been self-supporting, yet State aid must clearly be forthcoming under the proposed altered conditions.

## NOTES.

At a meeting held at Peterborough on the 3rd ult., in aid of what was defined as "The Cathedral Restoration Fund," the Bishop of Peterborough referred to "the care and skill with which the work of the restoration of the fabric of Peterborough Cathedral had up to the present been carried out," observing that he felt convinced that he was only putting into words the general feeling of many hundreds and thousands in saying that they were now prepared, before the whole world, to vindicate completely the steps so perseveringly adhered to by the Dean and Chapter; and he was fully justified in saying so. But the words which (as reported in the daily papers) he subsequently used, "whether it was not possible, before the new century dawned upon them, to see Peterborough completely restored," have rather an ominous sound. Why not, at all events use the word "reparation" instead of "restoration." That word would correctly describe the recent work on the west front of Peterborough, which was not "restoration" in the commonly accepted sense of that word, otherwise we should not have supported it. 10,000*l.* is still required, it appears, for the necessary work to the remainder of the west front. If that work is to be carried out in the same spirit as what has already been done, the 10,000*l.* will be well laid out. But do not let us hear of "restoration."

THE Eiffel Tower is to be "treated" with the view of rendering it more presentable and acceptable at the 1900 Exhibition. The lifts now in use are to be replaced by lifts "à grande vitesse" and with increased accommodation. The restaurant and concert room erections on the first platform are to be removed and the platform left clear. The "circular gallery" is to be widened by two metres all round, and the public are to be admitted to the top gallery also. The whole of the ironwork is to be painted a blue-grey tint, resembling the treatment of the iron-work in the "Beaux-Arts" and "Arts-Libéraux" Palaces of the last Exhibition. The tower, which has hitherto only been lighted with gas, is to have an illumination of 10,000 electric lamps. Unfortunately, these changes will do little or nothing to ameliorate the general ugliness and the outrageous scale of this too-celebrated structure. It is to be hoped that after the 1900 Exhibition, at all events, it will be removed altogether.

THE recent delays of the steamboat service between Dover and Calais are becoming a serious public inconvenience. Until

recently travellers could rely on getting into and out of Dover in the worst storms. Now unfortunate passengers are detained in the bay, or in hotels on shore, until a gale is over. It would appear that the new harbour works are responsible for this, and the fact merits the careful attention of the Government, for whom these works are being constructed. Whether the present effect of the new works has been contemplated by those who have designed these works we know not, but it is to be hoped that if the effect can be quickly obviated by expedition in the construction, every measure will be taken to press it on. If there is any probability of the present state of things becoming permanent it will be disastrous to the passenger traffic, not only between England and France, but between England and all parts of the Continent, and even India.

LAST Monday the Great Central Railway Company ran their first through passenger train from Manchester to London. Thus, the dream of many a long year becomes an accomplished fact, and another trunk line is added to the list of those serving the metropolis. As the "Manchester, Sheffield, and Lincolnshire," this line has had the reputation of being a very unfortunate one, and anything but a remunerative one for the ordinary shareholders. But it has been in the hands of directors of indomitable pluck and perseverance, as this bold extension abundantly proves. Monday's journey was in the nature of an experimental trip, only the genial and energetic General Manager (Mr. Pollitt) and a few other officials of the company being on board. It is understood that they were thoroughly satisfied, and that the train ran into the Marylebone terminus "punctually to schedule time." We may express a hope that this may be the case when ordinary individuals come into town by the Great Central, and that certain other lines that could be named would endeavour to follow so commendable an example.

FOUR correspondents have sent us copies of the Instructions to Architects issued by the Highworth and Swindon Union, for a competition for extension of their workhouse. The instructions demand that each competing architect should furnish drawings to  $\frac{1}{4}$  in. scale, "to be accompanied by a complete specification, priced quantities, and estimate of the total cost of the works," and in the case of the selected design the drawings, specifications, quantities, and estimate, are to become "the absolute property of the guardians." The drawings and specification are to show the exact means of ventilation and heating proposed. The following conditions are added:—

"The selected architect's charge for drawings, attendance at Local Government Inquiry, furnishing all particulars, necessary plans, specifications, and information required by the Local Government Board or their Inspector, all sets of tracings for working, all detailed drawings and general superintendence of the works, to be 5 per cent. on the amount of the building contract, provided that if the lowest tender received exceeds the said sum of 3,000*l.*, the architect's commission shall be reckoned and paid on that amount only. The commission to include all travelling and other expenses. No percentage to be paid upon the cost of any works charged by the contractor as extras, unless such extras are of the nature of additional works

especially approved and ordered by the Guardians. A clerk of works will be employed, but the architect will be required to take a general superintendence, and to visit the works at least once a fortnight during the progress.

A plan of the completed buildings showing all drains, water and gas pipes, suitable for mounting and hanging in the Board-room of the Workhouse, to be furnished without any extra charge. . . .

The Guardians do not bind themselves to accept any or either of the plans which may be sent in."

What kind of architects do the Guardians suppose will compete on such terms? We may add that the cost is not to exceed "about 3,000*l.*" (*sic*), for which there are to be provided fifty additional beds to the men's hospital, including separate ward for special cases, and a boys' ward; a new women's ward for eighty beds, including separate ward for special cases, girls' ward, and lying-in ward; and provision for the accommodation of four nurses and a small dispensary. Assuming the nurses' accommodation and dispensary at the modest sum of 500*l.*, that leaves 130 beds at 2,500*l.*, or about 19*l.* per bed! Now the average cost for a plainly built hospital may be reckoned at 200*l.* to 250*l.* per bed. Is the "3,000*l.*" a misprint for "30,000*l.*"? If not, the whole thing is absurd from first to last.

We learn that the property in Finsbury-circus and London Wall, described in our "Note" of October 29, realised a rental of 17,200*l.* per annum, which is estimated to represent a freehold value of about half a million per acre. Between the site in question and Finsbury-pavement lies another property, also appertaining to the Bridge House Estates, and covering about 15,700 ft. superficial, which was purchased in June last by the Eastern Telegraph Company on a building lease of eighty years, at a ground rent of 7,100*l.* per annum. The latter property comprises a range of long-established livery stables, which some identify with the "Swan and Hoop" livery stables where Keats's father was foreman to Jennings, the proprietor. Some uncertainty, however, exists as to this. In their "Recollections of Writers," Charles and Mary Cowden Clarke speak of the "Swan and Hoop" as being "on the Pavement in Moorfields, opposite the entrance into Finsbury-circus"—that is, on the west side of the present Pavement; and in Lockie's "Topography," 1810, the Pavement, Moorfields, is described as "the west side of Moorfields, extending from Moorgate to Finsbury-place." Thirty-three years ago there was a "Swan and Hoop" public-house (perhaps the old livery stables) at "No. 28, Finsbury-pavement;" the "Finsbury-pavement" of 1865 fronted the Southern part of Finsbury-place, South; whilst since 1865, Finsbury-pavement has been extended (by name) northwards to include (old) Finsbury-place, and thus to reach as far as Finsbury-square, and the houses have been renumbered. The confusion arises from the neglect of the fact that the "Pavement" of Jennings's and Keats's day was but a part of the present "Finsbury-pavement," which does not appear, by name, in the maps until about twenty-five years after Keats's death in 1821.

THE paper by Professor Silvanus Thompson on "Rotatory Converters," which was read at the opening meeting of the Institution of Electrical Engineers, is a very valuable and

Peterborough Cathedral.

Manchester to Marylebone.

Topography of Finsbury-pavement.

Making the best of the Eiffel Tower.

Highworth Workhouse Competition.

Rotatory Converters.

The Dover Harbour Work.



timely one. By rotatory converters Dr. Thompson means that class of electric machine where an alternating current enters the revolving part by two collecting brushes, and leaves it by another pair of brushes after having been converted into a continuous current, or *vice versa*. Many of these machines are in every-day use for the transmission and distribution of power for motive and railway work, as well as for lighting purposes. At Niagara, for example, they are used to convert the alternating current generated at the Falls into continuous current for the manufacture of caustic soda and aluminium, whilst at Dublin and Rome they are used for traction purposes. There will be four of these machines on the new Central London Railway, each of more than twelve hundred horse-power. Naturally, therefore, electricians are curious as to their theory and working. Dr. Thompson's paper will satisfy this curiosity to a great extent, and we can congratulate him on having filled up this gap in our electrical literature. He has given very simple graphical explanations of many difficult points in the theory. Although there is not a single formula in algebraical symbols given in the paper, yet all the necessary formulae are shown in graphical form by geometrical diagrams. Shown in this form his mathematical theorems appear almost self-evident, and only those who have been recently attempting to solve those problems can fully appreciate his excellent solutions. His graphical method of superposing currents is a novel one, and will be most useful for teaching purposes. By its means he shows very simply why the various coils of the armature of a converter are unequally heated. It also shows clearly the variable armature reaction, and hence is of use in explaining why converters do not run well in parallel.

A SUM of 200,000*l.* has been recently offered for this church, its site being required for other purposes, and the Temporal Council of the Westminster arch-diocese have asked for the Pope's consent to the disposal of the fabric and its site. Cardinal Wiseman chose St. Mary's for his pro-cathedral in 1852. It stands at the corner of East-street, Finsbury-circus, and was built in 1817-20 from John Newman's plans and designs at a cost of 26,000*l.*; it is illustrated in Britton and Pugin's "London." The church, 125 ft. by 98 ft., and 52 ft. high, has three aisles, each of which terminates in a chapel. On the rounded wall, behind a screen of marble columns, is Aglio's mezzo-fresco (begun upon wet plaster and finished in tempera) which he repainted in 1837\*; he painted also the ceiling frescoes. Forty years ago the interior was altered, repaired, and redecorated, and a sanctuary was added. It is estimated that in the adjoining burial-ground and in the vaults as many as 5,500 persons were interred; in the catacombs lie Bishops Poynter, Bramstone, and Gradwell. The remains of Weber, laid in the vaults on June 21, 1826, were removed, in 1844, to the churchyard in the Friederichstadt, Dresden. The "No Popery" rioters of 1780 destroyed the earlier Roman Catholic chapel and presbytery in Little Moorfields, which stood in Ropemaker-street; the congregation migrated to a house in White-street, close

by, where they remained until the opening of St. Mary's in 1820.

THE letters "R.E." after Mr. Oliver Hall's name on the catalogue of his works do not signify that he is a member of the corps of Royal Engineers, but of the Royal Society of Painter Etchers, who ought however to adopt the form "R.S.E." or "R.S.P.E.," since "R.E." by common use and consent belongs to the distinguished corps referred to. The exhibits are not etchings in this case, but a number of broad, fine, and bold landscape studies in oil and water-colour, on a small scale but showing remarkable power; and a series of lithographs which are just as good in their very different way, showing that Mr. Hall fully understands the value of reserve, of not overworking, in this form of artistic production. An admirable example of this is the small lithograph of "King's Lynn" (49), like an etcher's work done into lithograph; but all the lithographs are excellent as examples of this class of art. Among the other works those that are exceptionally fine are "Broughton Moor" (16), which is like David Cox over again; "Torver Fell" (17); "Bridgenorth" (26), and "Bringing Home the Sheep" (36), the last quite a poem in landscape. It is an unexpected and a delightful surprise to go into a gallery and find such work as this from an artist one had only before known as an etcher.

Drawings by Mr. H. Brabazon.

THIS exhibition of a set of impressionist sketches by an amateur, at Messrs. Boussoad & Valadon's gallery, is introduced to the public by an extravagantly laudatory notice by Mr. J. S. Sargent, prefixed to the catalogue. We have the greatest respect for Mr. Sargent's gifts as an artist, but we decline to have his opinions thrust upon us; and a comparison between his expressions in the catalogue, and the works exhibited on the wall, leaves the visitor in doubt whether a trick is not being tried on his credulity. Mr. Brabazon's drawings are simply brush-smears with a feeling for colour. In some cases it would be impossible without the catalogue to say what the drawing (?) was meant for at all. Let the reader look at "Sunset on the Riviera" (20), "In Rome" (30), "Sunset after Rain" (47), "On a Scotch Moor" (88), and ask whether such painter's smudges have any claim to be called art. Buildings, where inserted, are all tumbling about instead of upright. The one called "A Rose" (53), a still-life sketch, is an admirable bit of colour; but the so-called landscapes are little better than a pretence. Almost any one could be a landscape artist at this rate.

The Boadicea Statue.

AT the meeting of the London County Council on Tuesday the Report of the Highways Committee recommending the expenditure of 1,000*l.* in making the necessary alterations to enable the Boadicea group to be placed in position was formally withdrawn, in consequence of the receipt of a letter from the Office of Works asking for particulars in regard to the work, and pointing out that, under statute, it was necessary for the Office of Works to give their sanction before any statue could be erected in London. The Office of Works would do us, artistically, a public service if

they would refuse their consent to the erection of a group of sculpture which is very unsuitable for the proposed position, and which represents a standard of English sculpture much below that of the present moment.

## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

### OPENING MEETING OF THE NEW SESSION.

THE first general meeting of Session 1898-99 of the Royal Institute of British Architects was held at the meeting room of the Institute, 9, Conduit-street, W., on Monday evening, Professor Aitchison, R.A., the President, occupied the chair.

The Hon. Secretary (Mr. William Emerson) announced the decease since the last meeting of the following members: Major Alfred Heales, Hon. Associate, elected in 1882; Henry Hewitt Bridgman, elected Associate 1871, Fellow 1883; and John Gillett Livesay, elected Associate 1882.

Mr. Emerson further announced that Mr. William Nicholson Cumming, of Edinburgh, had been reinstated an Associate. He also stated that a statutory examination of candidates for the office of District Surveyor under the London Building Act, 1894, was held on October 27 and 28. Three candidates were examined, and the following gentlemen passed and had been granted a certificate of competency to act as District Surveyor in London, namely: George Henry Blagrove, of 7, Mornington-crescent, Regent's Park.

### The late M. Charles Garnier.

The President thanked the members for the courtesy and kindness with which they had supported him during the past year, and said he felt highly flattered at the thought that they considered that he had done his duty in the position of dignity and honour. The President went on to remark that since their last meeting the profession had, by the death of M. Chas. Garnier, sustained a great loss, about which it behoved him to say a word or two. The Institute did the late M. Garnier the honour to confer upon him the gold medal at their disposal. Of him it certainly might be said that he gave fresh expression to French architecture—an expression which never before had been seen. French architecture had peculiarities of its own, but the late M. Garnier added a new leaf to its laurels, and they all felt extremely sorry for the misfortune of his being taken away—not at an early age, it was true, but still long before they could spare the light that he could give to the whole civilised world. When they thought that the architect of the great Library at Venice lived to the age of ninety-three and had not taken to spectacles, they might well have hoped that M. Garnier would have been spared longer. But he was a man of nervous temperament, and his health could not survive the arduous work. He was sure they would pass a vote of condolence with France and with the French Academy on their great loss.

### President's Address.

The President then read the following address—

Brother Architects, Ladies and Gentlemen.—I think we may be congratulated on the improvement that is taking place in the appearance of London. It is a great triumph for architects to think that they are converting a rather dull city, mostly composed of brick walls with holes in them, into a town almost as picturesque and varied as the old towns of France or Flanders.

I think it was in the forties that Professor Cockerell, at the Royal Academy, gave the approximate number of the new churches and public buildings that had been erected in the preceding thirty years; but that list, astonishing as it was, would dwindle into insignificance beside the new buildings that have been erected in and around London within the same lapse of time.

Of very important buildings in the centre of London there have necessarily not been very many, but in the outskirts numberless town-halls, technical schools, and other municipal buildings have sprung into existence; and, though I am afraid we can hardly claim for most of them that they have rivalled the picked examples of the world's architecture, they mostly have some stateliness, picturesqueness, or originality.

\* Vide Eugenio Latilla's work on Fresco, 1842.



I regretted to read the remarks of Mr. Norman Shaw, who has been acting as one of the assessors on the designs for the buildings of the Californian University. He said that "The competition had been held in the hopes of discovering some architectural genius, but in this it had failed," and he felt "a twinge of national regret when no English name appeared among the selected eleven;" the plans selected were without exception of the French school. "Architecture," said Mr. Shaw, "is more thoroughly taught in France than in England;" "at the same time French teaching destroys individuality." It is a matter for regret that an English-speaking race should have to go to our neighbours for their architecture, but that may be because there is more architectural genius among our neighbours across the Channel than amongst the English-speaking countries on both sides of the Atlantic and in the Pacific; yet it is peculiarly unpleasant that a celebrated English architect can justly speak of a more thorough teaching being given in France. One naturally asks, Why is this? For one would think that what is teachable could and ought to be as well taught in England, America, and Australia as it is in France; at any rate the first thing that the English architects should do is to see that this inefficiency is corrected. I can hardly believe that teaching, if not carried far enough to stifle independent thought, can extinguish individuality, for certainly some of our great poets were the best educated men of their day. As far as we know we cannot give ourselves genius, but it is most probable that, if a large number of persons will acquire that which a good architectural education can give them, there will be a genius among them; and surely a well-taught genius is better than an ill-taught one.

There is a most interesting book written by Mr. Edmond Desmoulins, who says that the education given to the English has peculiarly fitted them to be successful colonists. Whether this method of education was deliberately chosen, or whether it was stumbled into through the natural bent of the people, does not appear: but we can only hope that, either by accident or design, we may find as successful a method of teaching architecture; for every English-speaking man in the world must wish that we could produce buildings that would vie with those produced in the most brilliant epochs of Greece and Rome, of France and Italy, and with the best Saracen buildings, and with the Gothic ones that pervaded Europe during the Middle Ages. We cannot hope, however, to equal the excellence of monuments that sprang into existence after stirring times, in nations where there was an adoration of the beautiful, particularly when some of these nations are believed by some philosophers to have possessed faculties as superior to those of the nations of Europe as the faculties of European nations are superior to those of the negro.

Architecture is the poetry of construction, and the noblest poetry is naturally found in buildings that are applied to the highest transcendental uses. A certain amount of comeliness is necessary to every building, except such buildings as are required to create fear, horror, or a sense of ignominy, such as castles, gaols, gallows, and pillories.

A building is an organism created by man for his own needs, which should emulate the organisms of nature. To take man as the highest organism, we may say that the man of the most striking appearance is not a perfect organism if he has some incurable internal defect; and so in a building no beauty will wholly compensate for its want of answering the purpose for which it was built; and even if it answer the purpose, and has a beauty that is quite incongruous with its use, it becomes as ridiculous in the eyes of judges as a man in a State dress acting as a scavenger. In some of the modern buildings that at first sight affect us strongly, from their size, mass, or ornamentation, if we see that this size and this massiveness are not necessary, that these embellishments are not consistent with the uses of the building, we merely despise the factitious effects.

As our knowledge of the strength of materials, of the strains and stresses that result from the different forms of building, becomes more accurate, it will naturally affect the shapes of the different parts of the building, and I think we must look very much to this for future advancement in architecture.

We want to mark those portions of buildings

that have special duties to perform with that architectural emphasis which is given by mouldings, and these mouldings have to produce the effect we want in our own climate. To use mouldings that were designed for climates different from our own, and consequently do not properly answer their purpose, is really to declare ourselves indolent or incompetent. We have plenty of plausible excuses, *i.e.*, that the Romans used the same mouldings whenever they built, and that their Renaissance imitators did the same, and that the archaeologists, our masters, would be shocked at any architect who attempted to think; but neither excuses nor bad examples will avail us, if our sole object is to advance our art. We have, too, to consider the purposes to which our buildings are to be put, the ratio of strength we must allow when a building is merely for a temporary purpose, or to last as a record for future ages.

According to the uses which the building is to subserve we must consider the ornaments that are to be given to it by the sculptor, and whether their forms are to be taken from vegetable life only, or are to include animals or man. Where buildings are to be used for the highest intellectual or moral ends it is perhaps difficult to find even figure sculpture that will sufficiently express their high use. In classic and mediæval times at least, sculptors employed for this purpose mythical or symbolic figures. In the present day we have almost given up all symbolic and emblematic forms, and have trusted purely to words, which do not strike the multitude and have not, in the bare form in which they are mostly given, the same effect on the mind as symbolic forms. Sculpture is wanted on all buildings, but its use should be imperatively called for by the people for all public buildings, for the sculpture, if properly designed, would more completely show the use of the building, and surely the public who pays for these buildings should be informed of their use; and this is particularly called for when the buildings are for benevolent purposes, such as hospitals, asylums, workhouses, rests, refuges, and homes. The speaking arts of sculpture and painting are particularly wanted for enlightening the people on the advantages of living in a free and advancing country. It is for statesmen to consider how much more contented the population of this country would be if the fine arts were used to proclaim the advantages the people enjoyed.

The subject of colour is one that has of late years fallen greatly into disuse, but, as far as I can comprehend, very unnecessarily; for as Nature colours all her works, and produces every sort of emotion from the combination of form, light and shade, and colour, it can hardly be inappropriate for man to do the same; and all architects know that monumental colouring may be as well marked as monumental form.

Hitherto the proportions used, or, as the ancients more properly called them, symmetry, which forms so important an element in architecture, has been almost confined to those taken from the highest transcendental buildings of the past; but we see in Nature every conceivable proportion, and most of these are good; consequently it is only from want of observation and want of skill that we confine ourselves to the proportions of Greek, Roman, or mediæval work; for Egyptian, Assyrian, Arabic, or Indian architecture has found no great favour in Europe.

The thing we want most is the advancement of architecture. But who is to show us the way? A deceased architect of marked ability said we must wait for another irruption of barbarians, and probably if they were barbarians of improvable quality they might solve the problem; but it would be a drastic measure that most of us at least would pray might not occur in our time. I think the greatest obstacle to the advancement of architecture is the fact that the bulk of Englishmen do not care about it in the least, and as far as I can judge, the fine arts are not likely to improve if no one cares for them. So every architect should be ready to point out what architecture does for a nation, and so help to create the want.

Architecture—and by that I mean good architecture—must even from the size and importance of its monuments create some sort of emotion in the beholder; and the least reflection will show him the vast army of various men that have been employed to get all those materials, and to bring them together, the thousands of craftsmen wanted to fashion them and put them in their places;

and according to the stateliness, the impressiveness, or the beauty of these buildings will the power, wealth, and grandeur of the nation that has erected them be brought before his mind. If these buildings are for the highest purposes and clearly express their character, deep emotion will be excited in him, and he will also think of the science that these buildings presuppose, the artistic skill of the architect and artists employed, and of the artistic tastes of the nation at the time in which they were built. As the late Charles Garnier said, "Architecture is an obtrusive art." Its masterpieces thrust themselves upon you and cannot be hid in a corner, and as long as they remain they call from the people who wish to see them a journey to the land of their creation; so if we want a good account of our time to be given to posterity, we must pick out good architects, encourage them to do their best in erecting important, well built, and æsthetic structures; at any rate, if this is neglected the age in which we live will be lampooned.

The painters and sculptors laugh at us when we say we want the public to show us what they like and what they want, and say, "We struck out a new type of woman never before painted, and new methods of treatment, and the public appreciated it and asked for more;" but their case is quite different from ours. It is not pleasant, I confess, for a painter to paint a picture or a sculptor to model a statue that does not sell, but an architect cannot put up a monumental building in the hopes that the public will approve of it and pay the expense. The most he can do is to show a drawing or a model in public, and persuade men in power, or of immense wealth, that he is both capable and original, and will be able to charm the public by his work. How did the architect of the Erechtheum persuade the State to employ him? So small a monument as that of Lysikrates could well have been shown by a model.

To get the proper teaching is not so easy as to say we want it; but I think in architectural education, as in general education, we must endeavour not to teach that which is dead nor that which is useless, but confine ourselves to the necessary and the useful. I think it is obvious that architecture is the poetry of construction, and consequently the very first thing to be taught is construction, and it is not the mere rough knowledge of the main principles, but that exact and accurate knowledge which was possessed by the late Romanesque architects of the properties of stone. They got this knowledge mostly by the failure of their buildings, but they reasoned on the causes of the failure—they observed, they thought, and they dared; while we have most accurate means of testing the strength of every material that falls to our hand, and if we be mathematicians we can solve every stress and strain, as the engineers have done. We have many new materials that our predecessors had not, and some of extraordinary strength and of a capacity for taking nearly every form with ease; I speak here particularly of cast iron. This is not without dangerous qualities when exposed to fire, but we ought not on that account to neglect it. With wrought iron we have other difficulties to contend with besides the danger of fire, for it is very difficult, and still more expensive, to make this in any agreeable or beautiful shape and to ornament it; but we cannot believe that the mediæval architects would not have largely used both materials if they had possessed them. We have, too, practically a new material in concrete, but this material also is not without its difficulties and its drawbacks, and we have besides the whole of what I may call old-world materials to our hand to deal with structurally in a more perfect way than they could ever have been dealt with before, and the whole category of old shapes to use, and new forms to adopt that have never been used before. If the dictum of Sir Joshua Reynolds be true, that by becoming familiar with the invention of others we learn to invent, the great knowledge that we possess of past architecture should make us more ready to invent; but, in fact, the gift of invention, so far as architectural forms are concerned, seems almost extinct. We have only this to say in excuse, that from the fifteenth century to the middle of the last century, European architects had nothing but Roman architecture, or its Renaissance imitation, to study and use; since then we have had Greek and Gothic. Neither of these styles, however, was used to stimulate invention, but merely to copy, and even in the present day it is doubtful whether the invention



of a new form, unless it were surpassingly beautiful, would be tolerated, for antiquarianism has usurped the place of architecture.

We must of course study the expressive and beautiful buildings of the past to learn how their effects were produced; but, having learnt that, our object should be to invent other proportions and other shapes, whose effects shall be equal or superior to those of the past, and when I speak of invention it is merely the adaptation of some of the innumerable forms of Nature. In the present day we should say that there was even less invention amongst architects than there was amongst the Romans, for the Romans at least started a new method of adornment when they carved the shafts of their columns or covered their pilasters with running foliage; but of course it is to the Gothic architects that we must look for those rapid adaptations that we now call inventions. Gothic architecture from the time that it emerged from Romanesque passed rapidly through what we call Geometrical and Decorated, till it fell into the mechanical stiffness of Perpendicular. Were these men blessed with greater powers of invention or adaptation than we are? or is it that the gift has become atrophied for want of use? At any rate, the substitution of archaeology for architecture must tend to this result, for if the wing of the apteryx dwindled to the size of your thumb-nail for want of use, it is probable that our powers of invention will do the same. I think that we are not so destitute of invention as we appear to be, for in out-of-the-way places in the country you see the elements of new Gothic and new Classic, where the architects have not been very learned, and have not had the fear of the archaeologist before their eyes.

When one speaks of invention, good invention is meant, and if we have the gift of invention it is only by the constant exercise of it, and by comparing our inventions with the excellence of the past, that we are likely to progress. I feel sure that the architecture of one century, or perhaps even of one quarter of a century, should not exactly resemble that which went before it, for besides our proclivities and aspirations not being exactly those of our fathers' time, if our knowledge and invention were progressive we should want the one for use and the other for emulation. In poetry we do not want the poets of our own time to portray again the character of times long past, for in that we can take but small interest; but to portray our advancing knowledge and the good, striking, and dramatic characteristics of our own time, as Tennyson so transcendently did; and we must never forget the labour and study he undertook to perfect himself, for he learnt Hebrew to see how the Hebrew poets arrived at sublimity. I do not speak about ornament, whether carved or painted, for that is the business of the sculptor or the painter. I by no means wish to discourage architects from being painters, sculptors, and ornamentalists, so long as they are good architects as well; but it is absurd to give up the advancement of our own art for the sake of being dabbblers in the arts of others. I have said nothing about the art of planning, although that is a most important art, and in these days, where convenience is thought of more importance than anything else, it is the art by which most competitions are gained. No one can deny that it is a useful art, and may be a very impressive one, and I am sorry to say that in its highest form it is not sufficiently studied.

I must say something on the results of our own examinations, for they have had a very stimulating effect on the students. The examinations let them know some of the things they ought to study, and give them an object to aim at. Examinations, however, have certain shortcomings like everything human; they test insufficiently. Besides, a parasitic growth clings to them; they lend themselves to cramming, whilst to cram is the last thing we should wish any architectural student to do, for it is a pure effort of memory to recollect what has been before written or said and repeat it at a given time, while the great object of instruction is to teach people to think and act properly. The sort of memory architects want is for the thing to be remembered to be firmly and permanently fixed; while anything crammed, when it has once answered its purpose, is almost immediately forgotten, and leaves scarcely a trace behind. Architecture in every one of its three branches requires accurate thinking to the end in view, and no cramming is of the slightest use in that direction. The only use I ever heard claimed

for it is that it enables a man to seem to know what he does not know, which may be useful on occasions.

The plan or arrangement of a building requires to be made perfectly suitable for its purpose, and in the cases when the building is not for common use it should have a certain effect, and if for high purposes the forms require to evoke feelings of dignity, stateliness, sublimity, or awe. I cannot refer to more perfect examples than the Parthenon and the inside of the Pantheon. Plans embody not only the general conception of the building and its supports, but should roughly inform a skilled person of the whole scheme of the completed building. We judge of the constructional skill of the architect by the smallness of the ratio of supports to the total enclosed area.

Every one of the three branches of architecture is not only sufficiently difficult, but may be considered transcendental, e.g., when we look through many plans we see that some are not only more convenient and more striking than others, but sometimes it seems as if the great planner were first and the rest nowhere. As buildings are meant to stand, it has always struck me as rather a paltry trick to arrest attention to make a building look unsafe, or to put in a piece of construction which forces us to ask how the architect has managed to make it stand. We want everything to look stable, so that our whole attention may be given to the æsthetic effect; but at the same time skill in construction will enable us to give great variety in the different parts of the building, some parts being slight or slender as compared with the important members of support, which must necessarily be bulky. No building should be put up that has not some evidence of the intention to make it comely, unless it be those buildings that are intended to convey horror or antipathy, of which I spoke before. Every building wants character, and that character should show its use; and when buildings are for the purposes of dignity, reverence, or awe, it is most important that their proportions should excite these feelings, and that any sculpture or painting that is put on them should heighten their effect in the same direction. Although it may seem a paradox to say so, the special convenience that should attach to every building is not so important in the highest sort of monuments, as for the monument to excite a feeling of sublimity, and for this reason, that high thought clothed with beauty is much more lasting than ordinary wants. If we could call to life the High Priest of the Parthenon, he might tell us that Iktinus and Kalikrates made the Temple very inconvenient for the service, but for more than fifteen hundred years that service has been abolished, and we are still enamoured of the sublimity of the Temple.

The principal things that want teaching when construction and the art of planning have been mastered are the proportions that have raised the various emotions in existing buildings, the art of moulding, and the exercise of the inventive faculties, for it is doubtful if invention is denied to any average human being, although some have it in such a profusion that it is easy to them to invent, and you probably recollect Plato's saying that those entrusted with public duties should find them easy. As I have so often said before, the construction should be the best that is known and practised, and any construction that is used merely because it is old is mere pedantry.

In every new building we arrange, difficulties arise in giving the necessary parts that æsthetic expression that we wish them to have. It is comparatively easy to mask the construction so that we may use the æsthetic solutions of deceased architecture, and so long as we pursue this course, architecture can never advance. What should be done is to encourage the student to solve the difficulty in his own way, and that is why ironwork is so serviceable, because in that the student has nothing to copy from, and he must use his inventive powers. Very long columns and stanchions, for instance, have junctions that must be kept together by ugly lugs and bolts or some other cumbersome addition, and these have to be made graceful or beautified. There are difficulties about moulding in iron, and in trying to solve these difficult problems the student should be recommended to aim at simplicity and elegance. If after many trials he cannot do anything towards a solution of these problems, he should abandon architecture.

As regards the practice of some of the younger members, there is too much straining

after effect; too much recourse to easy means of arresting attention, such as by rustication; too much partiality for curious and incongruous forms; the sewer-arch or water-opening is too much adopted for entrance doorways and attic windows—anything for a novelty! corners of square openings are rounded off, and projecting members are slightly curved or belled out. Now there is, in my opinion, nothing like straight lines for dignity, and the rounded corners and belled door and window heads mostly produce meanness. Another device is to make columns like those barrels that are used to fill in the odd spaces in ships, where the middle diameter is nearly double that at the base and necking, a gross and vulgar caricature of the entasis of the Greek columns. This device truly arrests attention, but only to make the judicious observer note the absence of any feeling but for vulgarity. Architecture is a very difficult fine art, and these attempts to attract attention easily merely show want of proper training and laudable ambition. Horace's maxim is as true now as it was then, that "you should study Greek examples by day and by night." The simplicity, grace, and restraint of Greek work cannot be too much studied, and that profusion of ornament that is now so common is not only opposed to Greek practice, but to good taste, for, as it has been truly observed, nothing great is obtained without simplicity.

There is one feature we want badly, and that is a well-designed large window, for there is great demand for these in the new public buildings, and we have nothing but the huge Roman semicircular window of the Baths, and the west end Perpendicular windows, which have little claim to beauty.

There is a great want of study of lighting; half the effect of large complex interiors is got by concentrated light against "a mighty continuity of shade," while most of our buildings are spotted all over with windows. One of the architectural devices the student should study is to get harmonious grouping of immense windows with those of ordinary and small size, and another is how to treat the problem of the seventeen-story building; for though we have not yet adopted this American device, the increasing scarcity of ground and price of land in large cities tend to produce it.

The only use of these addresses is to correct mistakes in teaching; to point out, if one can, where the defects in our practice lie, and to stimulate each other to greater exertion, and, if possible, to find out the way to the advance of our art. The chief things that act as incentives to mankind are the hope of wealth, the hope of honours, and the hope of immortality; and I certainly think that we might well increase one incentive by insisting on being paid for our work, for we are not paid now. I think the powers that he might well make another incentive more common by bestowing honours on the profession, which is now hardly recognised, although it does so much to raise the reputation of the nation by designing monuments which persons from all parts come to see. I can only hope that the prospects of immortality may induce those with congenial genius and the highest ambition to devote themselves to architecture, and to spare no thought and no labour in perfecting their work, so that it may vie with the best Greek work in grace, and with the Mediæval in impressiveness. We all wish that a great architectural genius may arise, for the sake of our art and of our country; and it is good for every one but the genius, for his highest traits are mostly brought out by misery. As Shelley says, "We learn in suffering what we teach in song."

I think, or at least hope, that with all the present teaching, striving, and devotion, we shall find the true path of progress, and that in the near future architecture may realise the transformation of the dragon-fly:—

"To-day I saw the dragon-fly  
Come from the wells where he did lie.  
An inner impulse rent the veil  
Of his old husk; from head to tail  
Came out clear plates of sapphire mail.  
He dried his wings—like gauze they grew;  
Through crofts and pastures, wet with dew,  
A living flash of light he flew."

Colonel Prendergast said he had been requested to move a vote of thanks to the President for his suggestive and interesting address. His first duty was to congratulate the President upon the honours which were showered upon him last year. He had not only gained the Blue Ribbon of the Royal



Academy, but what to them was a more striking circumstance—he had again been elected to the Presidential chair of the Royal Institute. But like many great positions, these were not without their drawbacks. He had often thought that on occasions of this kind it would be very desirable if they could carry out their old national trait and, perhaps, take sides and have a debate on the address. Could they not have a debate on the President's address? There was no doubt that the suggestiveness of what the address contained would afford ample field for such on debate. He (the speaker) had the profoundest admiration for the system which had been introduced in Paris into the profession to which they belonged. People were always talking about originality. He would like to know what originality was worth unless they knew the science and grammar of their profession. It was those who were doing the greatest mischief who were telling the young men—who, after all, were like young men and would like to shirk the difficulties of life—that they could at once start a style of their own and ignore those who had gone before and had made architecture what it was. The public wanted to be educated upon this subject, but he did not see how it could be done if architects were not educated themselves. *Architecture nascitur non fit*; and he was perfectly convinced that he was the greatest enemy of the young men rising among them who told them that they should start life with something different to what they had done. In France, too, there was the clique who had started this hare of originality. Only within the past few days there was in that well known French publication, *L'Illustration*, evidence that the most refined and the most artistic of European peoples had got this cancer growing amongst them. Anything more ludicrous, anything more detestable, it was impossible to conceive than the results shown by the pictures. The writer also charged full tilt at the architects, saying they were tied and bound to their worn-out doctrines, while the new school were the valiant pioneers of the ideal, who pushed forth manfully and who produced work which proved more eloquently than words what the future had in store. The President had called their attention to the use of iron construction. This was, indeed, a field for discussion. He happened in his daily walks to pass through St. James's-square where for eighteen months or two years a large building had been erecting. It was an object lesson to follow that building. It was fiction founded on fact. He asked the meeting to record a vote of thanks to the President for his very suggestive address.

Professor Roger Smith said he rose with pleasure to second the motion. It seemed to him that the phrase which more than one occurred in the address—the advancement of architecture—might well be the text of it, as it had been the text of more than one address he had heard at the Royal Academy. The President's desire had been to put before them several ways in which advancement could be made. There could be no question that novelty had a sort of fascination, especially if the new thing be good, not to say better than that which went before. He did not believe in the present day in the possibility of new styles being invented, except at the suggestion of new materials and new wants that might arise. These might modify their mode of building to a greater extent than they could foresee at present. But it was impossible for them to forget the forms which had been the outcome of all the years of civilisation, and which had covered Europe. It was impossible for them, too, to build without remembering that it was out of the question that the public should admire buildings without thinking of the forms which had been wrought out with the utmost care and skill during the different periods; and he believed that for some time to come originality must mean, not new features, but some new modification of existing features and certainly new combinations. About new proportions which the President had suggested, he (the speaker) felt a little misgiving. New combinations were possible in almost endless variety, and the words in which the President opened—pointing, as they did, to the transformation which was being made in London and to interesting buildings to be found in different parts of the country where architects were freer from the fear of critics—showed that some such a change was taking place. The large number of illustrations which appeared

week by week in the technical journals showed, too, what large sums were being expended and what progress was being made. They had only to compare the contents of one of these journals of to-day with that of, say, twenty or twenty-five years ago, to see what great advance had been made. This advance they must recognise, and he felt full of hope that in future it was going on. If the examinations and the Institute assisted in inducing men thoroughly and substantially to train themselves, that advance might be accelerated and might be a healthy one.

The vote of thanks was carried, and the proceedings shortly afterwards concluded with the announcement that the next meeting will be held on the 21st inst., when Mr. F. Bond will read a paper entitled, "The Comparative Value of Documentary and Architectural Evidence of English Cathedrals."

#### SINGAPORE TOWN HALL AND THEATRE COMPETITION.

In the middle of 1897 a committee was appointed to collect money for a permanent memorial in commemoration of the Queen's Diamond Jubilee, and to decide upon the form such memorial should take. About \$420,000 was raised, and with this it was decided to build a new Town Hall and Theatre. A difficulty then arose in selecting a site. Singapore land, in the town and for a distance of 1½ miles outside the town is, generally speaking, bad for building upon, inasmuch as it is swampy, and in many instances solid ground is not reached at less than from 60 to 80 ft. This is, of course, a serious matter even with an ordinary building, as so much money has to be spent in piling and in cement work, a very expensive item where all cement is imported, but in the case of a building such as was proposed to be erected it is even more so, as in some parts very great loads would have to be carried.

The committee after inspecting various sites finally decided upon the worst, and, without taking any professional advice as to the suitability of the site, called for designs for the new building, the advertisement appearing in the local papers—Colombo, India, Hong Kong, Shanghai, and Java, as well as the home papers, a premium of 200l. being offered for the first, and 100l. for the second premiated design, but with no guarantee that the successful architect would be appointed to carry out the work. When architects applied for particulars there were none to be had except the plan of the site (there were no levels given), the proposed amount to be spent, and some misleading data to calculate the cost of the building upon. Later on the Municipal Engineer made a few tests of the ground, and then with a few photographs of the surrounding buildings (none of which were worth the cost of photographing) these were sent to the competitors, but still no particulars as to the accommodation required; these followed about two months later, with a notice that the time for sending in had been extended one month.

On August 31, this year, eighteen sets of plans were received, one from Singapore, one from Hong Kong, Colombo, and Java, two each from India and Australia, the rest from England and Scotland. In August the committee made their award, Messrs. Franken & Sills, of London, being placed first; Mr. Tunstall, of Colombo, second; and Messrs. Swan & Maclaren, of Singapore, third. The drawings were last month publicly exhibited for a few days.

Messrs. Franken & Sills' design, which was placed first, had a fairly good workable plan, but it had one very weak point. The two buildings had been planned to be built one on each side of the principal entrance hall, the stage of the theatre adjoining the hall, thus placing the most dangerous part of the building, as far as fire is concerned, right in the centre of a large block of buildings; besides which, there would be a difficulty in getting in scenery; in fact, one could not see that any provision had been made for it. In other respects the theatre plan was very good. The style of work adopted was Indian, the proposed material being granite and red brick, with tile roof. The design was illustrated by a set of very highly-coloured elevations and a water-colour perspective; the colouring, however, did not agree with the materials specified. The roof

shown, too, was one which could never be used here, as it was so much cut up with dormers, minarets, small domes, &c., and could never be made water-tight in this land of tropical storms.

Mr. Tunstall's design, which was placed second, was somewhat similar to the last in plan, but lacking the good points. The design, which was illustrated by a poorly-drawn set of plans and elevations, was for a stucco building of severe Roman style.

Messrs. Swan & Maclaren sent in two designs, their plan being entirely different to the others, inasmuch as they had kept the two buildings separate—at least, they were only connected by an arcade. Their Scheme A, which was on the lines laid down by the Committee, was a two-storied one, while Scheme B was for a one-storied building, a design the authors considered more suitable for the site on account of its lightness. In this case the theatre was placed at the back, the main entrance of the hall doing service for the theatre also. In the other scheme the theatre was quite isolated except for the slight connexion before referred to. The plan of the theatre was an excellent one, well adapted to the requirements of the place.

"Butterfly" (Australia) sent in a very fine design, illustrated by a very good set of drawings. The design was far away the best submitted, but the plan was not so good as that of the first and third designs, and more extravagant; but with very slight modification it could have been made a very good one. The author explained that he was handicapped by not receiving the particulars as to accommodation until after his plans were completed.

Mr. J. A. Barr (Sydney) also sent in a most artistic design in a set of beautifully-executed drawings. The plan was simple, but a good one as far as the Town Hall was concerned, though the theatre was rather weak.

The remainder of the designs were very poor, with, perhaps, one exception, that of Messrs. Laville & Sevenoaks (India), which was commended by the Committee. The Committee, which consisted of three lawyers, two Civil servants, a banker, and an engineer, did their work fairly well considering that they had no professional advice.

Nothing has so far been decided with regard to the building.

#### ENGINEERING SOCIETIES.

**SOCIETY OF ENGINEERS.**—At the meeting of this Society on the 7th inst., Mr. W. Worby Beaumont, President, in the chair, a paper was read by Mr. Perry F. Nursey on "The Preparation of Rhea Fibre for Textile Purposes." After referring to the amount of time, trouble, and money that had been expended in developing the practical application of rhea fibre, which was the longest and strongest in nature for textile purposes, the author observed that the history of the endeavours to utilise its fibre extended back to the beginning of the present century. It was introduced into Calcutta in 1803, and was brought to England in 1814 by Capt. J. Cotton, to whom the Society of Arts awarded a gold medal. The paper went on to describe the various processes which had been successively employed, concluding with the observation that the preparation of rhea fibre for the spinner had advanced somewhat, albeit very slowly, and he expressed the opinion that the solution of the problem would be found in a combination of mechanical and chemical processes, chemistry stepping in as the handmaid of mechanics.

**PRESENTATION TO A CHESHIRE SURVEYOR.**—A presentation has just taken place in Chester to Mr. William Holland, late surveyor to the No. 1 district of the Cheshire County Council, from the foremen and workmen of his district. The presentation consisted of a black marble clock. On a gilt plate on the clock was engraved the following inscription: "Presented to Mr. William Holland, District Surveyor of the No. 1 District (Cheshire County Council), on his promotion, by the foremen and workmen of his district, as a mark of respect and esteem. October 29, 1898."

**CHURCH-ROW, HAMPSHIRE.**—Despite the protests that were raised by many residents in the locality, as well as by writers in the Press, the old houses Nos. 2, 3, and 4, on the north side of Church-row, have been demolished for the building of a block of five-story residential flats, to abut in the rear upon the lane turning out of Heath-street. The architect is Mr. G. Sherrin.





Design for Stained Glass: "St. Cecilia" By Mr. Edward J. Procter.

"ST. CECILIA": DESIGN FOR STAINED GLASS.

THIS design, which was exhibited at the last Royal Academy, is by Mr. Edward J. Procter, and is intended to fill a panel in one of the folding doors leading to a music-room.

MAGAZINES AND REVIEWS.

THE *Quarterly Review* contains a well-written article on Burne-Jones, in which, however, as in almost all the critical notices of him which have appeared since his decease, we find the same one-sided enthusiasm for the great qualities of Burne-Jones's art, with apparently an entire blindness to his weaknesses—the restricted nature of his powers; the mannerism of his figures, in which all personages, ancient or modern, allegorical or real, male or female, had the same physiognomy and the same expression; and the often rather puerile character of his intellectual conception of a subject. Lofty aims, consistency of style, and splendid colour, count indeed for much, but they cannot make us blind to such shortcomings as these; and so far from thinking, with the reviewer, that Burne-Jones's fame will grow and the value of his work increase in the coming years, we are persuaded that the present enthusiasm for his works will before long undergo some revision. In the article on "The Setting of a Greek Play," which is only very partially concerned with the architectural setting, Dr. Dorpfeld's "heresy," as we call it, of the absence of a stage and the mingling of the principal actors with the chorus, is dismissed as perfectly untenable and resting on no constructional evidence; though a suggestion is made, and we think a not improbable one, that in the fifth (B.C.) century the stage was of less height than it afterwards became, so that an occasional closer relation between the chorus and the principal actors is thus more easy to imagine than with the later more lofty stage. The *Quarterly* also includes an article on "Wireless Telegraphy." The writer would prefer to call it "Ethereic Telegraphy," and would apparently include under it signalling by rays of light. A fairly accurate and popular description of this system of telegraphy is given, but its drawbacks are barely touched on, and no mention is made of the recent improvements introduced by Dr. Lodge and described to the Physical Society this year. Too much credit is given to Signor Marconi. However much "his youth, his nationality, and the unworthy attempts made to belittle his success," may attract "the attention of the Press," these claims cannot be taken into consideration when apportioning due credit to the various pioneers of wireless telegraphy. Dr. Lodge exhibited to the British Association in 1894 a system of telegraphy substantially the same as that claimed two years later by Marconi in his patent. A well-known expert has stated that this patent cannot even be described as "a novel combination of old instrumentalities." We would submit that this is a more probable explanation of the check to Signor Marconi's progress than "certain financial considerations which the Limited Liability Act has done so much to create in this country."

The *Gazette des Beaux-Arts* contains an article by M. Eugène Müntz, on "Les Dernières Années de Léonard de Vinci," referring mainly to his rather unfortunate career as a military engineer, and with illustrations (most of them pretty well known) of his fantastic and impracticable designs for new engines of war, which M. Müntz rightly characterises as "inane." M. Gustave Frizzoni contributes an article on the recent exhibition of pictures of the Lombard school in London. There is also a short article by M. Roger Marx, on the etchings and lithographs of Paris by Eugène Béjot, accompanied by an illustration of a charming little upright etching of a Paris scene, taken from near the Pont Neuf, with the Sainte Chapelle in the distance.

The *Art Journal* leads off with an article on Rodin the sculptor, who is just at present thrust upon us everywhere, though we are glad to say there is nothing more here about that absurd Balzac block. Rodin is an original genius who is going the wrong way, and whose injudicious friends are encouraging him in it. When he did the "Age d'Airain" he was a great sculptor; he is now losing himself in eccentricity. What does the writer mean by saying that this work has "never been repro-



duced in England?" It was exhibited at the Academy a good many years ago, standing on the left hand of the entrance door to the octagon hall; and we are pretty certain it was also illustrated. "Maternité," an illustration of which heads the article, is also a really fine work. Among the other articles is one by Mr. Ashbee on his own designs for "table service," one on that rather over-rated artist Robert Scott Lauder, and one by Mr. Fred. Miller on Gesso work.

The Christmas number of the *Art Journal* is devoted to the life and works of Lady Butler, who well deserves this honour. The letter-press is by Mr. Wilfrid Meynell, who says truly that this artist has done for the English soldier in art what Mr. Kipling has done for him in literature. The illustrations include, besides some of the well-known works, a good many interesting sketches and studies.

In the *Magazine of Art* Mr. Spielmann has taken up the subject of "Coincidences and Resemblances in Works of Art," of which some illustrations are given. The "Money-changers" of Marinus van Romerswale is an obviously intentional imitation of Matsys' "Misers," to our thinking; on the other hand, the similarity of attitude in Reynolds's "Mrs. Lloyd" and Fragonard's "Chiffre d'Amour" is probably a pure accident, and the resemblance is not so very close either, only that both figures are writing on a tree. An article on "A New Symbolist" introduces us to some of the works of Sascha Schneider, a kind of German Blake, whose designs are striking and original, but do not constitute a very healthy form of art. We have more pleasure in welcoming a new artistic humourist in the person of M. Ronner, son of Mme. Ronner of cat fame; his four silhouette subjects, "An Address of Congratulation" are delightful. M. Ronner has started a new method of treating silhouette, in very close cross-hatching instead of solid black; this enables him to slightly modify the tone for a background figure, without departing from the pure silhouette treatment in each separate figure. "The Quaint and Grotesque in Cotton Designing," by Mr. Dolman, treats a new subject, and contains some interesting and novel designs.

The most important article in the *Architectural Record* (New York, quarterly), and a very important one, is that by Mr. J. Beverley Robinson, on "Principles of Architectural Composition," illustrated by a number of sketches and views of actual buildings. This is an attempt to find out and illustrate the influences which govern the relation of parts to the whole in the masses of a building. Whether we should agree with all the writer's views is one question, but we recommend the article to the attention of architectural students, as a thoughtful and original study. Mr. Ferree continues his articles on "French Cathedrals" (we presume these will ultimately appear in a permanent form), and Professor Goodyear, in an article on "Unknown Italy," we are glad to find quitting his untenable theories on the distortion of buildings to do his readers a real service by describing and illustrating buildings in Italy which are out of the beaten track of architectural illustration, and well deserve attention.

The *Artist* includes among its contents an illustrated article on the Bayeux tapestry; illustrations of repoussé work by Mr. Edgar Simpson, and a paper on Furniture Design read by Mr. Edwin Foley before the "Society of Designers," a body of which we have not before heard.

The *Engineering Magazine* includes articles on "The Great Railway Stations of England," considered in regard to plan and construction, by Mr. Cargill; the latest improvements in the French lighthouse system, by Mr. Jacques Boyer, and "Sanitary Principles in the Construction of Isolation Hospitals," by Mr. G. A. T. Middleton.

The *Studio* (October 15) devotes a long illustrated article to Burne-Jones's "Cupid and Psyche" frieze at No. 1 Palace Green. "The Renaissance of the Medal in France" is illustrated by many examples, but the title is rather behind the day; if the medalist's art had died out in France, its "renaissance" at all events took place a good while ago. We only wish a similar renaissance would follow in England.

The only article in the *Century* of special interest to our readers is "The building up of a World's Fair in Paris" by Baron Pierre de Coubertin; a sketch of the progress of the Paris Exhibition. The sketch of "the Ferris wheel," with the Eiffel Tower looming behind

it, suggests what may well be called "a queer landscape."

The American magazines are all full of their late war at present; *Scribner*, for example, merely touches on artistic topics in a few words on "Photography and the Stage" at the end of the number, an inquiry into the cause of the ugliness of many photographic representations of stage groups which are pleasing enough in the life. The simple explanation, we take it, is that photography sees too much and sees it too instantaneously, missing the transition from one phase of action to another. *Harper* is entirely apart from artistic subjects this month.

The *Antiquary*, among its "Notes of the Month," contains a sectional drawing of a curious underground chamber found at Penfai, in Glamorganshire. The chamber is circular, constructed of unworked stones and plastered internally; 5 ft. high, 6 ft. 6 in. wide at the bottom, and 8 ft. 9 in. wide at the top, with an outlet through the roof, reached by two projecting stones or steps in the side. Various explanations are offered as to its original use; our contemporary is inclined to the opinion that it was an old charcoal oven. Can any of our readers offer a suggestion, or confirm this one?

The *Essex Review* (quarterly) contains an article on "Wanstead, its Manor and Palace" with an illustration of Tyney House, Wanstead.

We have received also the *Révue Générale*, the *Genealogical Magazine*, the *Gentleman's Magazine*, the *English Illustrated Knowledge*, and *The Quarry*.

#### ARCHITECTURAL SOCIETIES.

GLASGOW ARCHITECTURAL ASSOCIATION.—A paper by Mr. Austin Woodeson, Association Travelling Student, was read at the usual monthly meeting of this Association, held in the Rooms, 187, Pitt-street, on the 1st inst., Mr. George S. Hill, President, in the chair. Mr. Andrew Rolls, in Mr. Woodeson's absence, read the paper, which was a description of a sketching tour of a fortnight's duration made by him this summer in Berkshire and the surrounding counties. The paper was illustrated fully with about thirty-five drawings executed by himself during his stay. The drawings, which showed buildings in Reading, Bray, Mapledurham, Abingdon, &c., comprised illustrations of churches, almshouses, &c. Many of the buildings were further illustrated by large scale details and measured drawings. Mr. Woodeson referred to the southern counties of England as offering to the architectural student an excellent sketching ground. All types of building in styles ranging from Norman to Elizabethan were to be constantly met with.

EDINBURGH ARCHITECTURAL SOCIETY.—The Edinburgh Architectural Society met on the 2nd inst., when Mr. John Kinross gave an address as hon. President of the Society. Mr. P. E. Nobbs presided. Mr. Kinross confined his remarks to the architecture of the city and suburbs of Edinburgh, and contrasted the munificence of men, such as Mr. Usher, Mr. Findlay, and Mr. M'Ewan in beautifying the city by the erection of handsome buildings, with that of the landowning and speculative classes, who were doing their utmost to destroy its amenity. He insisted on wide streets, with ample light, being necessary for the health of the community.

LIVERPOOL ARCHITECTURAL SOCIETY.—"The Construction of Hospitals for Consumptives" was the subject of a paper read by Dr. J. W. Hayward before the members of the Liverpool Architectural Society, on the 7th inst., at the New Law Library, 41, Castle-street. Mr. W. E. Willink, President of the Society, was in the chair. Dr. Hayward said the site for hospitals for consumptives ought to be elevated, and, if possible, on the southern slope of a hill, so that it would face the mid-day sunshine; as far out of town as convenient, and with as much ground space as could be afforded. He dwelt with emphasis upon the importance of abundance of sunshine and fresh air, and strongly recommended the pavilion plan as the most desirable form a hospital should take, with both sides exposed to the sunshine. Speaking of the interior arrangements, he recommended a central corridor, with wards on both sides. As a precaution against infection, he urged the desirability of the interior walls being composed of glazed bricks, with no right angles, and as few corners or crevices as possible, or anything

that might serve as lurking-places for dust or germs. In regard to ventilation, the air should be changed three times every hour, day and night, summer and winter. He recommended that fresh air should be taken into a warming, drying, and disinfecting chamber in the basement of the pavilion, through inlets in the walls on each side, and thence allowed to pass through gratings into the corridors above, and so into the wards either through the doors or special inlets. To abstract the foul air an outlet should be provided in each ward near the ceiling, conveying the bad air into a glazed earthenware pipe direct up the building, and out above the roof. With properly-proportioned outlets and inlets, the ventilation could be efficiently controlled.

SYDNEY INSTITUTE OF ARCHITECTS.—At a monthly meeting of the Sydney Institute of Architects on September 21, the President (Mr. J. B. Barlow) occupied the chair. A letter was directed to be sent to the hon. secretary, Royal Institute of British Architects, asking that examinations for the Associateship of the Royal Institute of British Architects might be conducted in New South Wales as well as in England. Professional practice and charges were discussed, and in the matter of reform in this direction it was left with the council to draw up proposals to be submitted to the next meeting. In the matter of the Fellowship of the Royal Institute of British Architects, the secretary was directed to have printed and circulated the letter lately received, which intimates that, according to the amended by-laws, any practising architects may, on the recommendation of the council of any allied society, be elected to the Fellowship by the council of the Royal Institute of British Architects without further ballot.

#### ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting of this Institute on the 2nd inst., Judge Baylis, Vice-President, in the chair, Professor T. McKenny Hughes read a paper on "Amber," and in illustration of his remarks exhibited a collection of amber which he had made, chiefly in the Mediterranean and North Sea. He referred to some early notices of amber, described its composition and mode of occurrence, and pointed out that it could be made plastic or worked into new compounds which would pass for amber, suggesting in this way a possible explanation of some of the exceptionally large vessels said to have been made of amber, and some of the unexpected inclusions said to have been found in it. He then gave a short sketch of the history of its discovery, described the differences of colour, and discussed the distribution of the several varieties and the question whether the darker and especially the ruby colour was due to original difference of origin and composition or was a superinduced character due to the mode of preservation. If due to the various species of tree which yielded the resin, then it might depend upon climate and other geographical conditions, and thus be a more or less reliable indication of trade routes; but if it was due to difference in the mode of preservation, then the colour and the differences of composition which accompanied the colour could not be depended upon as evidence of the district in which it was produced. Among the specimens which he exhibited were some of dark ruby red, both from Sicily and from the North Sea; also from both districts specimens of honey and dark sherry-coloured amber. He explained that the proportion of ruby red to the yellow amber was very small in the North Sea and very large in Sicily, but pointed out that most of that found in Catania was carried down the river Simeto from beds on the flanks of Etna, whereas that found in the Baltic and North Sea was washed out of marine silt and had therefore been long subjected to very different conditions. He then adduced evidence to prove that the red colour was produced by the mode of preservation, exhibiting specimens in which the different colours were seen on one fragment; also beads from a Saxon grave, which were presumably from the northern area, in which the yellow had been more or less changed to a dark red; and a series of amber ornaments from an Etruscan tomb where all that were sufficiently well preserved to be examined were of a ruby red. He thought that there was a considerable original difference in the colour of amber, in some cases depending upon the varieties of tree and climate; that



there is commonly a change of colour due to the mode of preservation; but that colour and accompanying difference of composition can not be relied upon to determine the region from which isolated specimens have been derived.

**BRITISH ARCHÆOLOGICAL ASSOCIATION.**—The first meeting of the session 1898-9 was held at the rooms in Sackville-street, Piccadilly, on Wednesday, the 2nd inst., Mr. C. H. Compton, Vice-President, in the chair. Many objects of mediæval religious art were exhibited by Mr. Andrew Oliver, consisting of several crucifixes and one processional cross with reliquary; also four paxes and an ivory figure of St. Michael and the Dragon, of Spanish workmanship; and a figure of Our Lord, with movable head of ivory—this also is Spanish of the sixteenth century; the hands and feet are lost; they were, doubtless, also of ivory. The most interesting exhibit was a hanging lamp of rough terra cotta, in the form of a fish, of early Christian date. Mr. Patrick, Hon. Secretary, reported the discovery, early last month, at Paul's Wharf, Upper Thames-street, of a portion of an ancient wall, 4 or 5 ft. in height, composed of massive random built Kentish ragstone, resting on a grille of squared timbers. The wall apparently had no squared face. It was found at a depth of 12 ft. or 13 ft. below the present ground line, in excavating for new buildings under the superintendence of Messrs. Stock, Page, & Stock, who thoughtfully communicated these particulars. The Rev. H. J. D. Ostley, Hon. Secretary, reported further discoveries at Dumbarton, where the *Cranog* was recently found, as described in the last September number of the Journal of the Association, from which it appears that the place where the canoe was unearthed was actually a rock; a curious ladder was here found, the rungs of which were cut out of the solid wood. All the relics have been placed in the museum at Glasgow. They appear to belong to the Neolithic age, no metal of any kind being discovered, the objects being of bone, stag horn, jet, chert, and cannel coal; some querns were also found. The first paper of the evening was by the Rev. Cesar Craine, the subject being "Our Cities Sketched Five Hundred Years Ago," and was read by Mr. Astley in the absence of the author. The subject of the paper was a description of a most interesting fourteenth-century transcript by an unknown scribe of Geoffrey Monmouth's "History of the Britons," now in the British Museum, and numbered *Bib. Reg.* 13, A. iii. A characteristic feature of this manuscript is the addition to the text of many drawings of persons and places. The scribe would seem to have travelled much and to have been well acquainted with the places of importance on the road from London to Edinburgh, and has embellished the margins of the vellum pages with sketches of the chief buildings; thus we have the Tower of London, the Castle of Edinburgh, the walled border town of Carlisle, and York Minster, all delineated with some skill and clearly recognisable. The abbey churches of Bath, Gloucester, Winchester, with many others, and innumerable coats of arms and banners, added very great interest to this little old-world volume, which may have served the draughtsman as a guide-book or traveller's companion. The paper was illustrated with photographic representations of many of the pages of the manuscript. Mr. Patrick, Hon. Secretary, exhibited on behalf of Mr. J. T. Irvine some very carefully measured drawings of the beautiful seventeenth-century oak pulpit which, until recently, adorned the church of Yaxley, Hunts.

#### THE METROPOLITAN ASYLUMS BOARD.

At a meeting of the Metropolitan Asylums Board on Saturday last week, the Works Committee submitted the following draft clause for insertion in future contracts:—  
"The contractor shall on all work executed for the managers pay the rates of wages and observe the hours of labour agreed upon by the Association of Employers and the representative trades of the workmen, but in the case of any trade where no such agreement exists then the rate of wages and the hours of labour must be those current in the district where the work is executed."

Mr. Street, who moved the original resolution, protested against the evasion of all reference to trades-unions in the recommendation, and urged that the Board had practically by the resolution arrived at pledged itself to the

recognition of trades-union rate of wages. The word "representative" was misleading, and he moved to use the phrase "trades-unions" in its place.

This was seconded by Mr. Lile, but was lost, and the recommendations of the Committee were agreed to.

#### THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The second meeting of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, W., on the 4th inst., Mr. H. J. Leaning, Chairman of the Section, in the chair. A debate on "Modern Architectural Tendencies as illustrated by Contemporary Work," was opened by Mr. C. H. Strange, Sen. Sec., who read some notes contributed by Mr. F. M. Elgood, who was unable to be present at the meeting as announced.

Mr. Elgood said he would confine himself to one tendency only, which seemed to him to have a distinct bearing upon the architecture of the present time, as it would, if persevered in, on that of the future. This tendency was the assimilation of styles, shown not only in domestic but in public and ecclesiastical buildings. How a style was to be picked up at the point it was dropped and further developed it was impossible to say, but it appeared to him that it could only be done gradually and apparently undesignedly. The author drew attention to the present day revival of the Queen Anne and the early Georgian, and to the increasing number of buildings of all sizes which were characterised by features derived from those periods. He thought it natural that architects should hark back to the time when architecture in England was on the progressive wane, and attempt to start afresh from the time when invention gave way to copyism; this seemed to be at the period soon after the Renaissance architecture of Europe became incorporated with English tendencies. We appeared to have done with Greek porticoes and Gothic street fronts, and to be making the buildings represent what they were. The architect most prominent in leading to the desired goal, he thought, was Mr. Norman Shaw. A notable feature in the revived style was the constant use of the horizontal cornice—often boldly crowning a building where the roof rose. With the use of this feature the broken skyline had to a great extent died away, the gables when used being made into steep pediments with the cornice running up them. Another feature was the employment of rustications, in quoins, columns and in windows and door dressings frequently to an exaggerated extent. He wondered whether any one would be bold enough to rusticate a cornice. A house built by Mr. Wade for Lord Windsor was a capital example of the modern tendency. In it were found forms and details of the Queen Anne and Georgian types, originally and effectively employed. The author thought that the possibilities of the style seemed infinite and adaptable to all methods of treatment and materials in large or small buildings. In the modern instances of the style there was little or no evidence of copyism, but a wonderful originality is apparent. Instances might be noted in the work of Mr. Norman Shaw at Queen's Gate, Scotland Yard, and at Liverpool, and also in that of Mr. R. T. Blomfield, and Mr. H. Ricardo. Perhaps a growing enthusiasm for and a striving after truth and simplicity, had a marked influence on modern tendencies. Another tendency was to be seen in the revival by the architects of the formal garden. The author asked if the apparent tendency towards uniformity of style was not a mere theory of his own but a real one. Who could say that it might not lead to the formulating of a truly English twentieth century progressive architecture?

Mr. Lanchester said they could hardly look forward to any prospect of forming an accurate view as to the future without taking some retrospective glances to obtain their bearings. Up to about sixty years ago, our architecture was running on lines, more or less parallel, with that of the Continent; then we broke away, leaving a few, such as the Cockerells, Pennethorne, and some of the best of the provincial men, to carry on the previous traditions, while others, such as Burges, Street, Devey, and Norman Shaw, struck off, with the object of securing a more distinct personal touch. They had many followers, but the

leaders were far beyond the capacity of most, and while the first three were fortunate in leaving us before the great downfall, the last named was now expiating his sins by the adoption of a severe classicism. While one would feel it hard to lose the work of such men, one could well wish that their influence over their weaker brethren had been abated. No one would have dared, prior to the advent of their heroic individualism, to have inflicted upon us such blatant puerilities as those which composed the bulk of modern architectural work. Then the lesser minds took refuge in the unexciting and inoffensive commonplace conventionalities of the period; now they unhesitatingly put forth whatever form of foolishness happened to present itself first. On the Continent they had kept closely to the Classic tradition which, although it suffered from a tendency to sink the individual, more than compensated for doing so by the way its insistent demands on a thorough training in proportion welded together the whole body of its votaries, and made possible a definite and deliberate progression—which could only be compared to the gradual evolution of mediæval architecture. The irregular course which we had pursued had precluded us from working in the same manner; nor was it practicable for us to take up a foreign style and base our work upon it. Our national sympathies would prevent such a course being satisfactory. The work of the foreign schools, which was practically all French, seemed to lack what we consider essential to a happy result, in that their designs were too self-contained—they did not suit them to their natural surroundings. We had a strong tendency towards simplicity and severity, and our utilitarian spirit kept a powerful check upon any inclination towards superfluous exuberance. Our weaknesses were due to an almost entire lack of technical skill in design, but he was inclined to think that we were awaking to a perception of our deficiencies in this respect, and to see that a severer mental training in architectural design was necessary before we could hope to produce work for lasting appreciation.

Mr. Jemmett said we should have a reason for all that we did. He thought that individualism or vanity was the leading principle of modern work, and that eccentricity was adopted for its own sake. Fashion appeared to rule architecture at present, and we were working on no definite single principle, though we had in England a tendency to treat materials in a logical manner. We were so thoroughly insular in character that we disregarded and were ignorant of what was being done abroad. To evolve a new style we must first become all of one trend of thought.

Mr. Hopkins thought that the last two speakers were Job's comforters; they said we had thrown over traditions, but would it not be more correct to say we had thrown over antiquarianism? He thought that the best of our modern work would be as much appreciated in two or three hundred years time as it was at present.

Mr. Strange said that the buildings now being erected were influencing the tendency of the times. A general tendency in life was that the knowledge of the *savants* and the scientific man was disseminated amongst the populace—the architectural tendencies were of a similar character—a great mind influenced the rest. We saw a general feeling for the fitness of things was running over the whole country, even on the part of the speculative builder. The tendency was in two directions—one was shown by the desire for ostentatious ornamentation and splendour, which was an outcome of the general prosperity, and one which we must appreciate as a desire for fine building. The other tendency was towards a simplicity of treatment. Simplicity was the last resource of complexity. Symmetry was a result of the desire for simplicity.

The debate was continued by Messrs. H. V. C. Smith, G. Lucas, Humphrey-Jones, and A. S. Taylor.

The Chairman summed up, and a vote of thanks to the openers of the debate—Messrs. Elgood, Jemmett, and Lanchester—was put to the meeting and carried unanimously. Those gentlemen then briefly replied, after which the meeting terminated.

**FENCHURCH-STREET.**—Mr. T. E. Colclutt has prepared plans and designs for premises for Lloyd's Register of British and Foreign Shipping, with frontages in Fenchurch-street and the proposed new thoroughfare, Lloyd's-avenue, leading from that street to Crutched Friars.



## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday afternoon at the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Hampstead Vestry 10,400*l.* for electric lighting purposes, the Islington Vestry 6,780*l.* for similar purposes, the St. Martin's Vestry 5,000*l.* for sewerage works, and the St. Pancras Vestry 10,110*l.* for paving works.

**Compounding Engines, Crossness Outfall.**—The Main Drainage Committee recommended, and it was agreed, (a) That the estimate of 10,342*l.*, submitted by the Finance Committee in substitution for that for 8,450*l.*, adopted by the Council on July 20, 1898, be approved, and that the Council do sanction a further expenditure of 3,784*l.* in connection with the compounding of the engines at the Crossness outfall; (b) That the tender of Mr. Benjamin Goldfellow, amounting to 20,684*l.* for compounding the engines at the Crossness outfall be accepted.

**The Works Department: Jobbing Work.**—The same committee reported as follows, the recommendation being agreed to.

"We have to report that the cost of the following jobbing works, carried out under the direction of the Council by the Works Department, has largely exceeded the several amounts authorised by the Council, and that it becomes necessary for us to obtain the Council's sanction to the additional expenditure incurred:—

	Work ordered.	Expenditure authorised.	Cost.	Schedule value.
	£	£	s. d.	£ s. d.
(a)	Side-entrance in St. George's-circus, Southwark	12/10/97 85	121 9 0	89 8 10
(b)	Side-entrance in South-end-road, Hampstead	12/10/97 75	166 8 2	101 0 11
(c)	Repairs to Stamford Brook sewer near Willesden	1/6/97 150	203 4 11	160 16 6
(d)	Formation of shafts in Holloway-road	19/5/96 800	1,583 17 10	964 13 5

The manager of works has called our attention to the low prices allowed in the schedule in respect of excavation, timbering, and brickwork in sinking shafts, and he points out that the prices in the schedule are accepted as a whole, some being remunerative and others exceedingly low, but that taking the accumulated results of the whole of the engineer's jobbing works, a considerable saving is shown upon the schedule value. The statement is borne out by the fact that during the three years ended March 31 last the schedule value of all main drainage jobbing works amounted to 28,589*l.* 5*s.* 8*d.*, while the actual cost was only 25,645*l.* 8*s.* 2*d.*, showing a saving of 2,943*l.* 17*s.* 6*d.* After conferring with the manager and engineer, we are satisfied that the prices allowed for sinking shafts do not represent the actual value of the work executed, and that the excess of the cost over the schedule value does not show that the Council had been the loser to that extent, and it would appear to us that, if similar cases are not to occur in the future, the jobbing works schedule might with advantage be modified in this particular. It may be mentioned that the price allowed for excavation, viz. 1*s.* 10*s.* per cubic yard, is the same for all depths, and that though the sewer in Holloway-road, above referred to, is 15 ft. 5 in. to 90 ft. below the surface of the road, no extra allowance is made under the schedule by reason of the additional labour and expenditure involved. We recommend—that the Council do sanction the additional expenditure incurred in carrying out the following works:—(a) Side-entrance in St. George's-circus, 38*l.* 9*s.* 9*d.*; (b) Side entrance in South-end-road, 91*l.* 8*s.* 2*d.*; (c) Repairs to Stamford Brook sewer, 53*l.* 4*s.* 11*d.*; (d) Shafts in Holloway-road, 783*l.* 17*s.* 10*d.*

**Slade Ravine, Plumstead Common.**—On the recommendation of the Parks and Open Spaces Committee, the following was agreed to:—

"That the Council do offer no objection to the proposal of the Plumstead Vestry for the completion of a dam with penstock at the Slade Ravine on Plumstead Common, at the head of Roydene-road, conditionally upon the Vestry undertaking to carry out the whole of the work to the satisfaction of the chief engineer, and the chief officer of the Parks department; to the maintenance and management of the dam and penstock being undertaken entirely by the vestry, subject to the condition that the penstock shall only be drawn up very gradually, and on no account during rainfall, and also to such other conditions as the chief engineer may deem desirable; and, further, upon condition that the Plum-

stead Vestry give an undertaking, in terms to be approved by the solicitor, to pay to the Council, as owners of Plumstead Common, compensation for any damage which may be done to the common on account of the proposed works, and also to indemnify the Council against any claims for compensation whatsoever which may be made by owners or occupiers of adjoining property, or any other bodies or persons in respect of damage caused by or on account of the proposed works, or by the War Office in respect of interference with the rights of that Department."

**Small Open Spaces and Churchyards.**—It was also agreed to invite representatives of the Vestries and District Boards in London to meet the Parks and Open Spaces Committee in conference, with a view to determining upon some general scheme for the maintenance of the small open spaces in the country; and that the Local Authorities be invited to send one representative each to the conference.

**Boadicea Statuary Group, Victoria Embankment.**—The following report was submitted by the Highways Committee:—

"The Council on March 29 last, on the recommendation of the General Purposes Committee, approved as a site for the Boadicea statuary group by the late Mr. Thomas Thornycroft, which Mr. J. I. Thornycroft desired to present to the Council, the extreme end of the Victoria Embankment wall, by the corner of Westminster Bridge; and the Council on the same day authorised us to make the necessary alterations to the Victoria Embankment wall to enable the group to be placed in that position. We may point out that, by Section 60 of the Council's General Powers Act, 1898, the Council is authorised 'to erect and maintain, or contribute towards the provision, erection, and maintenance of works of art in London; and under this authority the expenditure necessary for altering the wall can be incurred. Mr. T. G. Jackson, R.A., with whom the Architect has been in communication, has submitted a sketch, which we have approved, of a pedestal for the group. The height of the base of the group is shown upon this sketch as to be about 11 ft. 6 in. above the top of the embankment steps, i.e., 5 ft. higher than the temporary platform upon which, in order that the general effect might be seen, a plaster model of the group was placed, and remained for some time. We have received a joint report from the Engineer and the Architect, suggesting that the inner portion of the pedestal should be constructed of brickwork, and the upper part faced with Portland stone and the lower with granite—as this mode of construction would be less expensive than the use of granite throughout—and that the cover of the pedestal, upon which the group will stand, should be of bronze. They estimate that the cost of the work if carried out in the way suggested, and inclusive of the cost of making the interior of the structure available for the storage of tools, would be about 1,000*l.*; and, having fully considered the matter, we think that this is a fair estimate. The expense incurred by the Works department in putting up and removing the temporary platform above referred to has amounted to about 93*l.*; and to this expenditure we have to add the Council's sanction. We have requested the Finance Committee to submit a special maintenance estimate for 1,100*l.*, to cover both these items of expenditure, and we recommend that the Council do approve the special maintenance estimate for 1,100*l.*, submitted by the Finance Committee in respect of expenditure incurred and to be incurred, under the resolution of the Council of March 29, 1898, authorising the Highways Committee to make the necessary alterations to the Victoria Embankment wall to enable the Boadicea statuary group, presented by Mr. J. I. Thornycroft, to be placed in the position indicated in that resolution."

Mr. Benn, Chairman of the Committee, asked leave to withdraw the recommendation.

Lord Hardwicke said he was about to move that the recommendation be referred back, on the ground that the sum asked for was much in excess of the value of the statue.

Mr. Benn said that her Majesty's Office of Works required that particulars should be furnished to them, and their statutory consent obtained, before any statue could be erected in London. That had been overlooked by the Committee until they were reminded of the statute by a communication from the Office of Works.

The report was then withdrawn.

**Housing of the Working Classes.**—The Housing of the Working Classes Committee recommended:—"That it be the policy of the Council to proceed from time to time, as opportunity shall offer, with the acquisition, under Part III. of the Housing of the Working Classes Act, 1890, of sites available for the erection of working-class dwellings within the County of London; that all clearances which involve rehousing be done at the sole cost of the Council; that housing accommodation should be provided for a number of persons equal to that of

the working classes displaced by any scheme under the Housing of the Working Classes Act, 1890, or under the provisions of any Improvement Act; that housing accommodation for persons displaced be provided within the County of London, but not necessarily in the immediate neighbourhood of the displacement, due consideration being given to the needs of those living on any particular area."

Mr. Dickinson moved as an amendment to the first recommendation, that the matter be referred back to the Committee.

The Chairman of the Committee having agreed, after discussion, to take the recommendations back,

Lord Onslow moved that it be an instruction to the Committee to report further not later than that day three weeks. There seemed to be a disposition among some members of the Council to shelve the question.

Mr. Cornwall seconded the amendment, which was agreed to after some discussion.

**Cinematograph Entertainments.**—The Committee of the Theatres and Music Halls reported that they had considered the question of revising the regulations respecting the use of cinematograph lanterns in premises licensed by the Council for public entertainments. The regulations referred to were approved on January 25, and the Committee found from the experience which had been gained since then by the enormous development of these exhibitions as a means of popular entertainment that some revision was necessary. The Council's chemist had, therefore, after conferring with the Chief Officer of the Fire Brigade, the Superintending Architect of the Council, and some of the principal makers and operators of cinematograph lanterns in London, drawn up certain revised regulations which they thought the Council would do well to adopt. Among the regulations is the following:—"The cinematograph shall stand in a suitable fire-proof room, which shall be entirely enclosed; the floor also being fire-proof. The door shall open outwards and be self-closing. One of the firemen of the establishment shall be in attendance near the apparatus with a wet blanket and two buckets of water. No inflammable material shall be within two yards' distance from the enclosure. The audience and seats shall at no point be less than 8 ft. distant from the lantern; the audience being prevented from approaching by a suitable rail or barrier."

The regulations were all adopted.

**Holborn to the Strand Street and Clare Market Scheme.**—The Improvements and Housing of the Working Classes Committees recommended:—

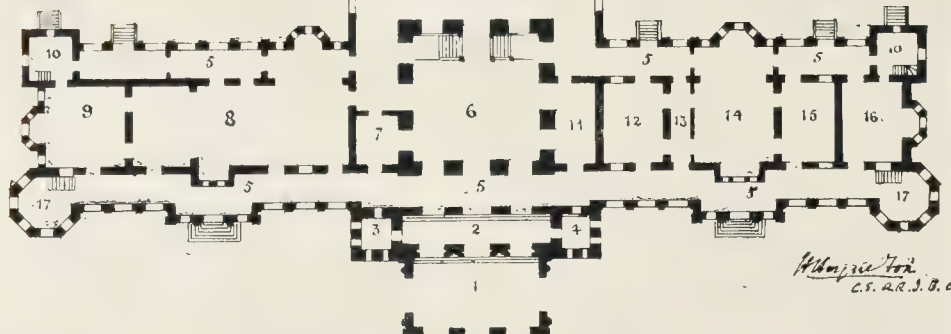
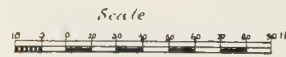
(a) "That, having regard to the nature, extent, and importance of the Holborn to Strand improvements, and to the special circumstances connected with the case, the Improvements Committee shall, notwithstanding existing references to the Committee, be charged with the clearance and laying out of all property comprised in the Clare Market scheme, and of the whole area between Holborn and the Strand, the sites agreed by the two Committees to set apart for working-class dwellings being subsequently handed over to the Housing Committee. (b) That the Housing Committee do supply information to the Improvements Committee as to any negotiations now on foot for the purchase of any property on the Clare Market area. (c) That it be referred to the Finance Committee to make any necessary re-arrangement of the accounts between the two Committees. (d) That the Improvements Committee do consult the Housing Committee when formulating any street improvement which would appear to involve a scheme for rehousing the persons of the labouring class to be displaced, or when preparing for submission to the Home Secretary any rehousing scheme in connexion with a street improvement sanctioned by Parliament and undertaken by the Council."

The recommendations were agreed to, and the Council soon after adjourned.

**PUBLIC IMPROVEMENTS, SHEFFIELD.**—On the 3rd inst. Mr. Frederick H. Tulloch, M.Inst.C.E., Inspector to the Local Government Board, held an inquiry respecting the application of the City Council of Sheffield for sanction to borrow various sums of money for various purposes. Mr. Sayer (Town Clerk) explained that the Town Council had applied to the Local Government Board for sanction to borrow 30,638*l.*, for the provision of a refuse destructor in Penistone-road; 9,750*l.* for additional works at the Lumley-street refuse destructor; and 12,000*l.* for the completion of the Town Hall. Evidence was given by Mr. C. F. Wike (City Surveyor), who produced plans and estimates of the work to be dealt with.



# GOVERNMENT HOUSE RANGOON



## References to Plan.

1. Carriage Porch.
2. Vestibule.
3. Visitors' Register.
4. Hydraulic Lift.
5. Verandah.
6. Central Hall, with Grand Staircase.
7. Gentlemen's Cloak Room.

8. Dining Room and State Banqueting Room.
9. Billiard Room.
10. Servants' Stairs, with Lavatory and Water-closet under.
11. Ladies' Cloak Room.
12. Corridor.
13. Passage.

14. Lieutenant Governor's Office.
15. Library and Aide-de-Camp's Office.
16. Private Secretary's Office.
17. Stairs.
18. Ball Room and State Durbar Room.
19. Ambulatory.
20. Ante-room and Stairs to Card Room.

## Illustrations.

### THE GOVERNMENT HOUSE, RANGOON.

**T**HIS palatial building has been erected at Rangoon from the designs of Mr. H. Hoynes Fox, Executive Engineer of the Public Works Department in Burma (and also an Associate of the Institute of Architects), as an official residence for the Lieutenant Governor.

The site of the building is a fine piece of undulating and well wooded ground of over seventy acres in extent, in what was formerly known as Windsor Park. The plan is in the form of a cross, the head of which is the portico, which is 47 ft. in length, one story in height, and which is an indispensable adjunct to a house in Burma, and especially so in Rangoon, which has an annual rainfall of about 100 in., 90 per cent. of which falls between the months of May and October. The roof of this portico is flat and laid with Minton tiles, and thus forms a terrace to sit out on and enjoy the cool evening breeze during the warm months of the year.

The entrance-hall is 42 ft. square, and is carried up through the three floors and lighted from the top. It contains the grand staircase of solid teak wood, carved by Chinese and Burmese workpeople under the superintendence of a German woodcarver.

The labour required for the interior decorations of this and all the other rooms in the building had to be imported from Madras and from the Punjab, some two thousand miles away, as the class of work attempted here was entirely new to the province.

The arm of the cross contains the reception and living-rooms, which are planned on the Indian barrack principle. All the rooms are arranged in line side by side, with verandahs front and back. The left wing on entering contains, on the ground floor, the banqueting hall, a room 70 ft. by 26 ft., with a recess and

bay used as a private dining-room for every day. The walls and ceiling are hand-painted in oils. Beyond the banqueting hall is the billiard-room. The back verandah space is utilised for the pantry and serving-room. The kitchen, scullery, larder, &c., are placed in a separate building, 60 ft. away from the main building, and connected with it by a covered passage leading into the serving-room.

Above the dining-room is the State reception or drawing-room, 70 ft. by 26 ft., and 26 ft. in height. The ceiling is covered and hand-painted in oils, as are also the walls. This room is decorated in the Louis XV. style; and is cooled by means of electric fans dotted about on the window sills. The back verandah is converted into a conservatory, and contains some of the rarest and choicest varieties of ferns and orchids. The room over the billiard-room is the boudoir. The floor above contains nothing but spare bedrooms, each of which has its own bath-room.

The right wing on the ground floor is used entirely for the Lieutenant-Governor's offices. It contains a room for the clerks, and a room each for the private secretary and aide-de-camp, in addition to the Lieutenant-Governor's own study, 38 ft. by 26 ft., exclusive of large bay windows front and rear. The first floor of this wing contains the Lieutenant-Governor's bedroom, with two dressing-rooms and two bath-rooms *en suite*; also a similar suite of rooms known as "the State Rooms," and which are reserved for the Viceregal visits and for distinguished visitors. The floor above contains spare bedrooms, and the rooms occupied by the private secretary and the aide-de-camp. The loftiness of the floors permits of dividing up the back verandah into intermediate floors, thus giving a mezzanine between ground and first floor, and another between first and second floors. These intermediate floors are used as box-rooms, store-rooms, and linen-closets.

The ball-room, which is the principal room in the house, forms the foot of the cross. It measures 80 ft. by 40 ft., and is 40 ft. high in the centre of the ceiling. It is surrounded on

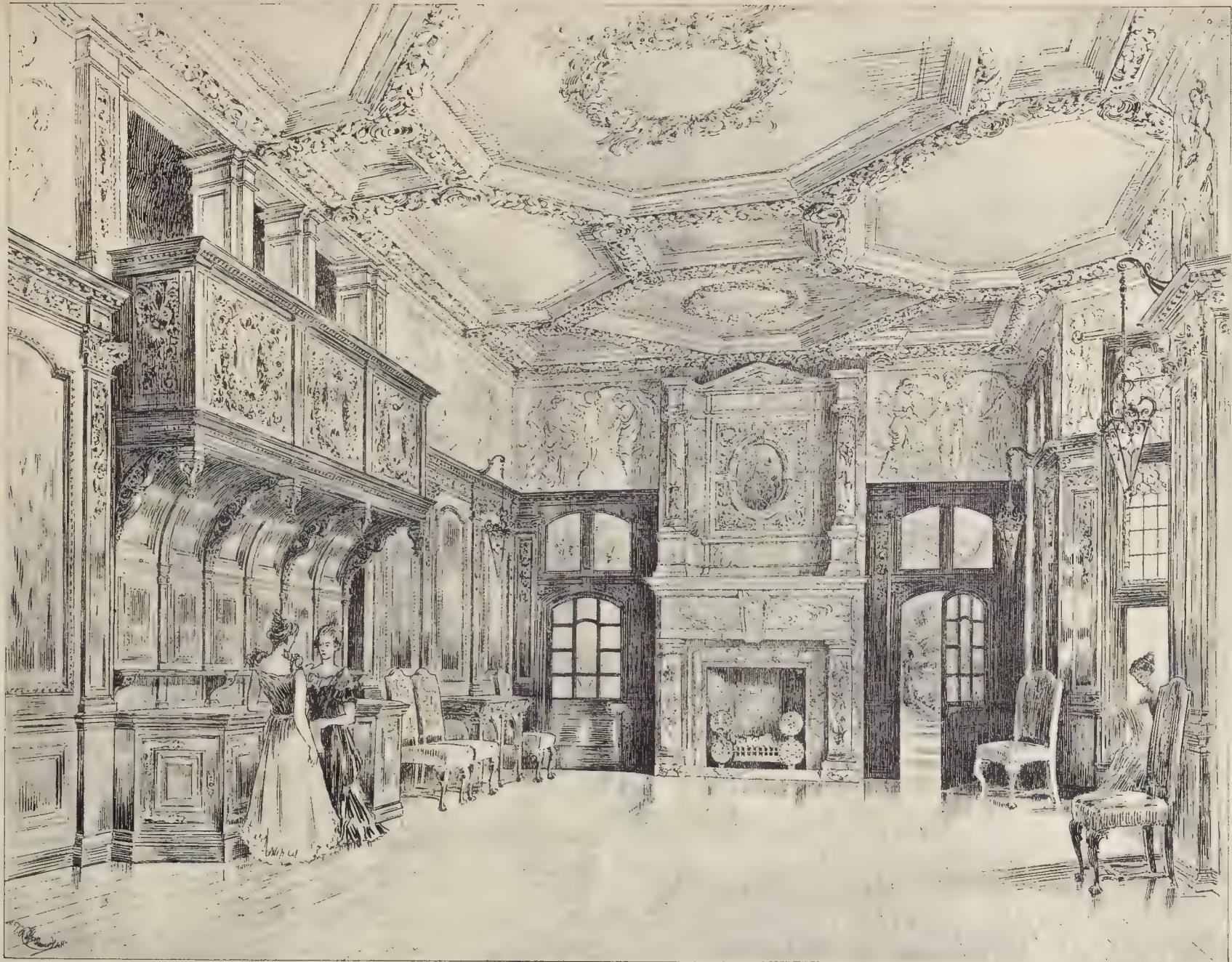
three sides by a corridor and gallery 14 ft. wide. Columns and pilasters of the Corinthian order are arranged in pairs round the room, and carry a cornice and the coved fibrous plaster ceiling manufactured by Messrs. Geo. Jackson & Sons, of London.

The materials are red brick and terra-cotta, manufactured by Messrs. James Stiff & Sons, of Lambeth; who had no ordinary task to perform in supplying about 30,000 cubic feet of terra-cotta, manufactured from drawings made some 7,000 miles away, and sending them out ready for placing. This, however, was all successfully done; the terra-cotta arrived in regular consignments every three weeks, and the architect states that "each piece fitted exactly into the place intended for it, and no trouble was experienced either from crooked pieces or bad joints." This happy result, we may add, speaks also for the care with which the detail drawings must have been made; and architect and manufacturer may share the credit.

The entire building is lighted by electricity, having an installation of its own consisting of duplicate boilers, engines, and dynamos capable of working over 500 lights and storage batteries for 100 lights. The entire plant was supplied by Messrs. H. F. Joel & Co., of London. The steam is used for pumping up water from the well to the water towers on the two sides of the central gable, the water being lifted over 120 ft. The condensed steam is used for supplying hot water throughout the house.

In regard to sanitary arrangements, the whole of the water-closets (some twenty in number) and the bath-wastes flow into two large iron tanks placed in the lowest part of the grounds, and two hundred yards away from the building. These tanks are supported on brick pillars, and are sufficiently high to allow the municipal night soil-carts to get under them. The valve is then opened and the contents of the tanks let into the carts in which they are taken away. The tanks are moreover ventilated, and provided with man-holes, and as they are emptied every night, there is



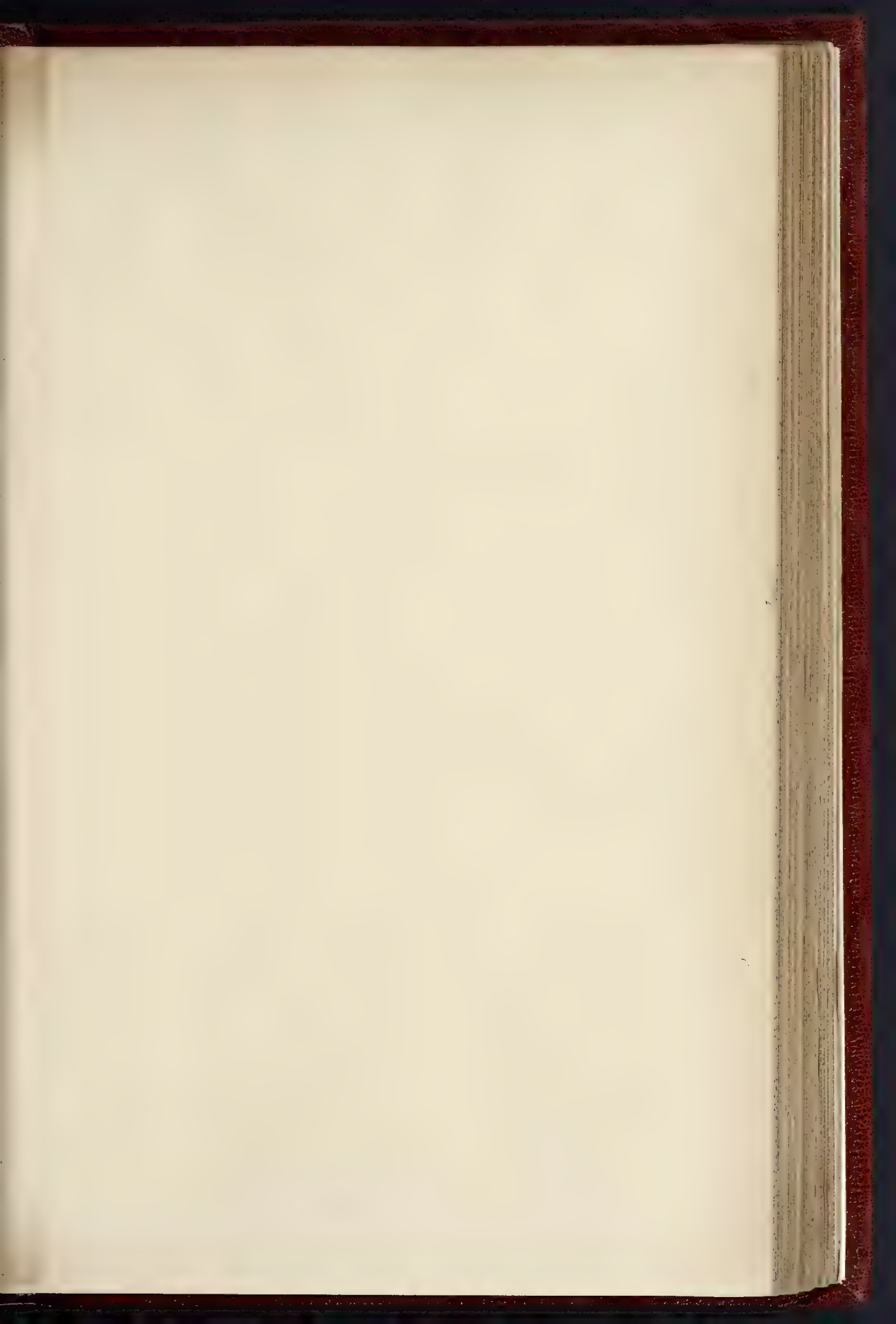


MR. PHOT. SPRADLEY & CO. 4 & 5 EAST HARCING STREET, LONDON, E.C.

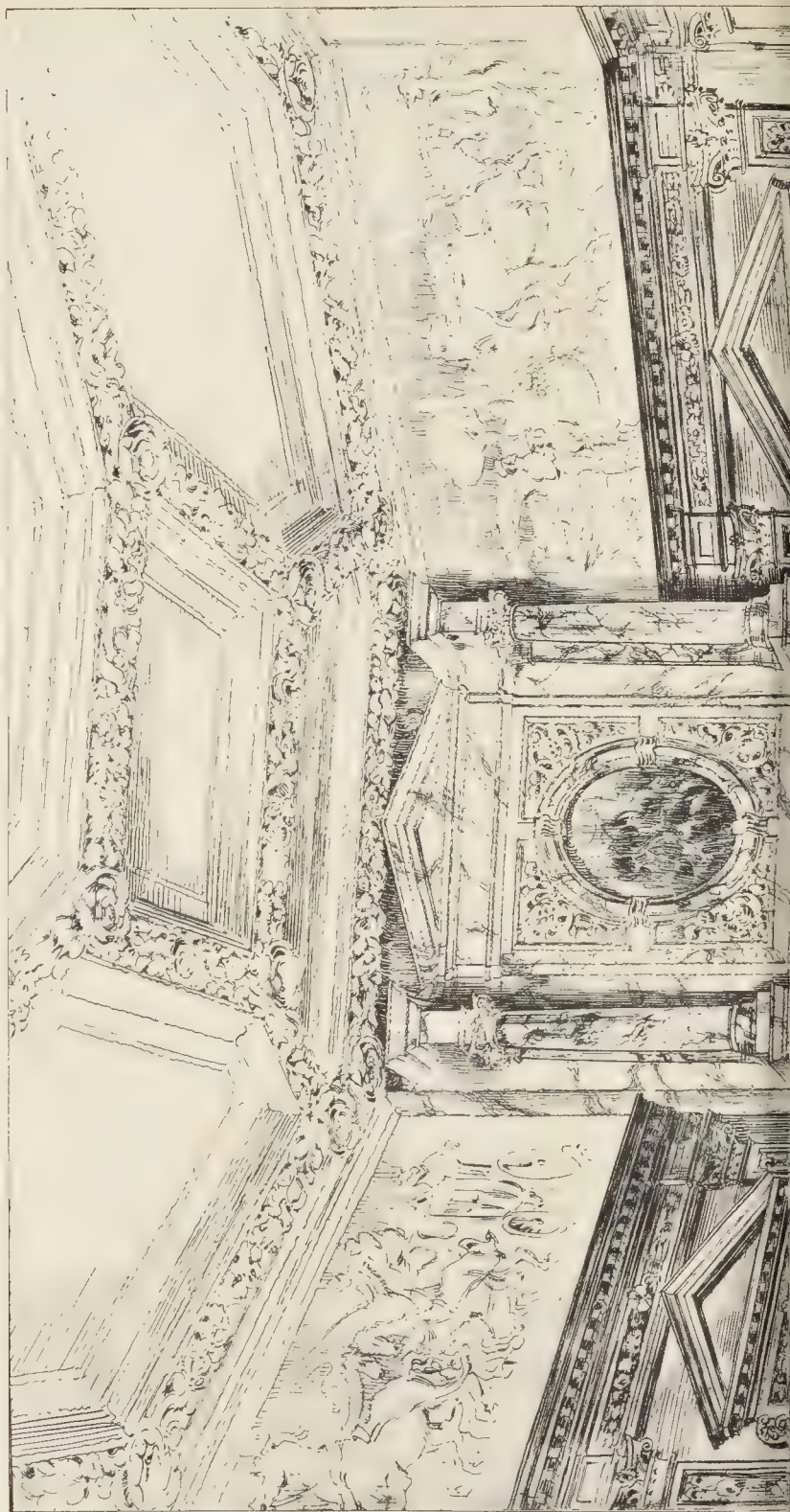
THE DINING-ROOM, PADDOCKHURST.—MR. ASTON WEBB, F.R.I.B.A., ARCHITECT



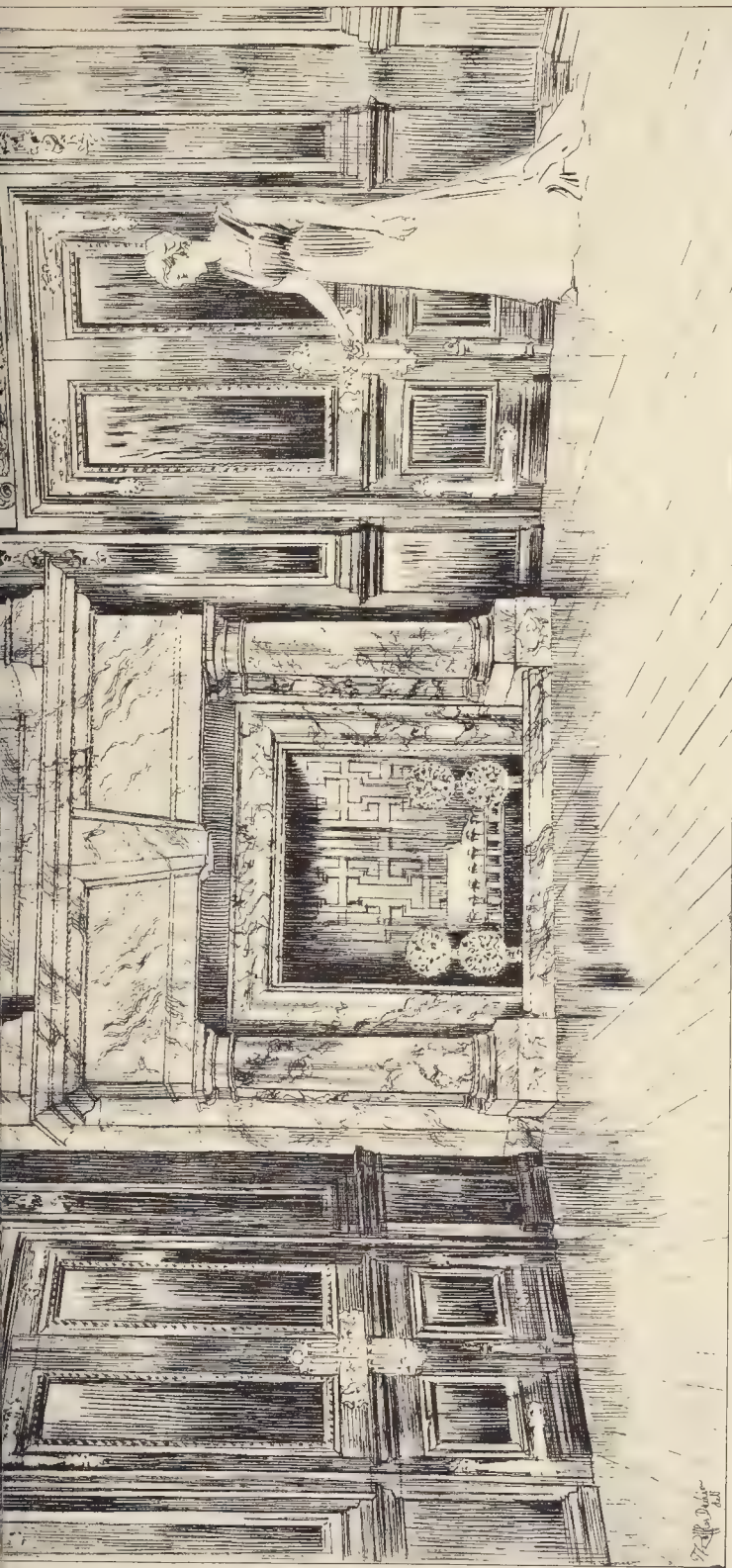




THE BUILDER, NOVEMBER 12, 1898.







NO. PHOTO SKETCHES A.C. L. 4 & 5 EAST HARDING STREET LETTER JANE E.C.

DETAIL OF END OF DINING-ROOM, PADDOCKHURST—MR. ASTON WEBB, F.R.I.B.A., ARCHITECT

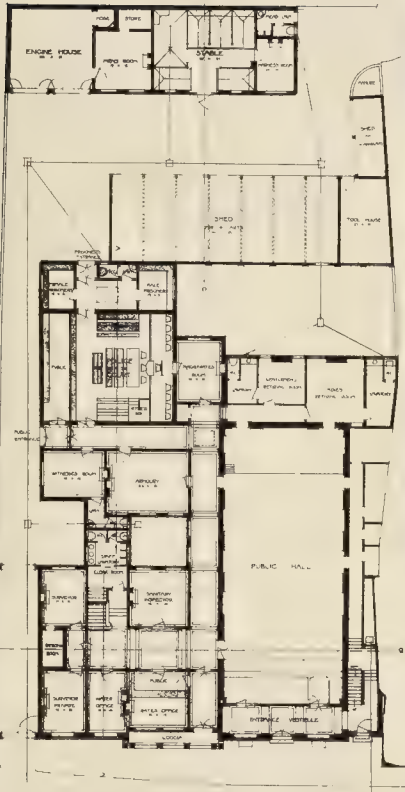






PROPOSED TOWN HALL, GODALMING.  
SELECTED DESIGN.

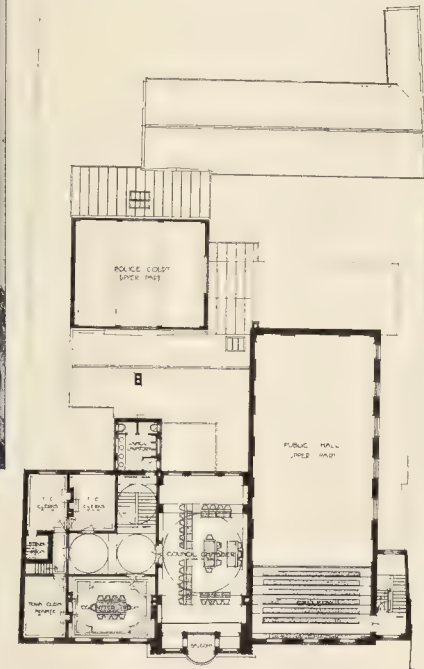
MESSRS. LANCHESTER, STEWART, AND RICKARDS,  
ARCHITECTS.



GROUND FLOOR



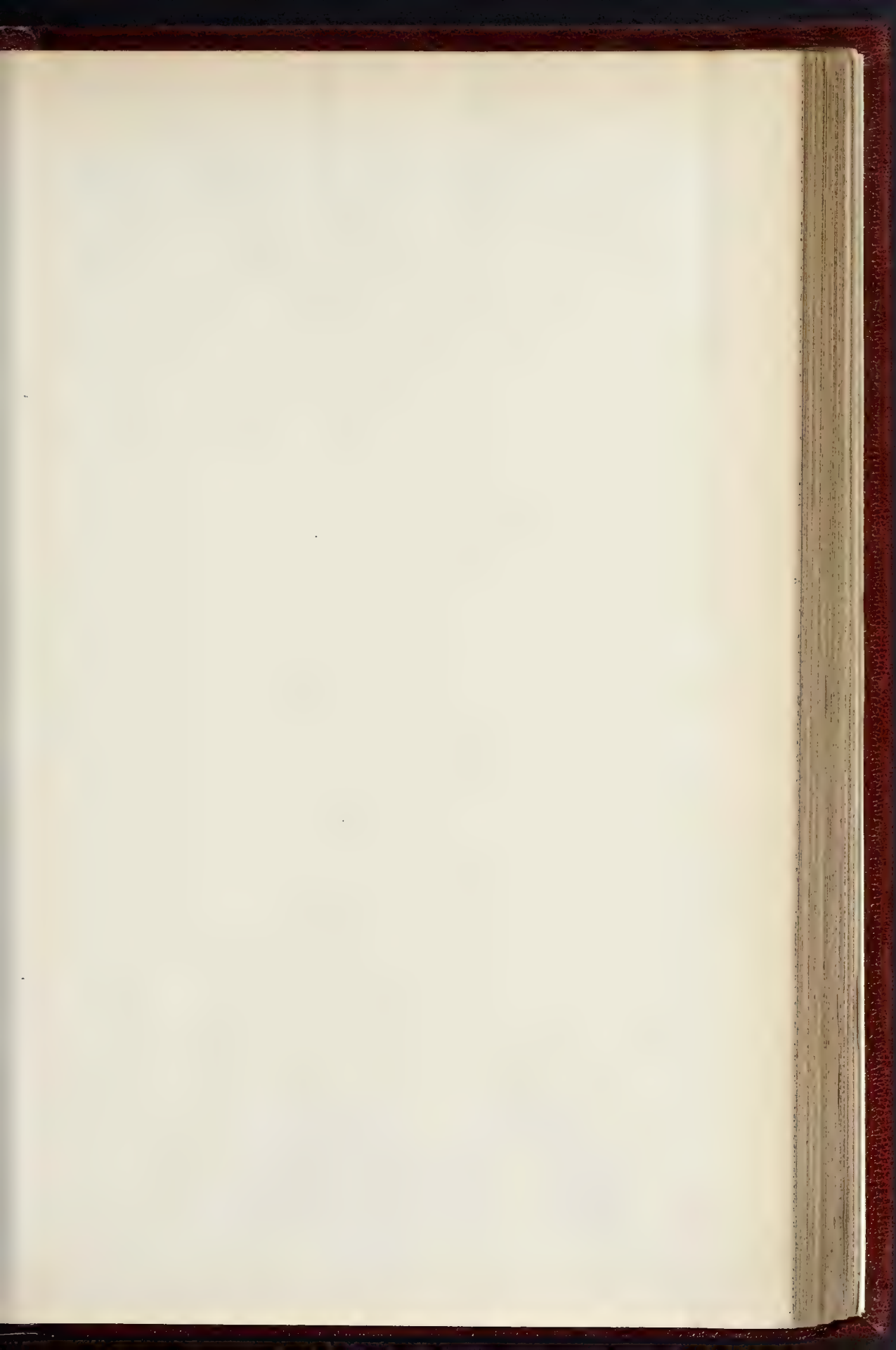
FRONT ELEVATION



FIRST FLOOR







THE BUILDER, NOVEMBER 12, 1898.



THE GOVERNMENT HOUSE, RANGOON.—MR. H. HONEY FOX, A.R.I.B.A., ARCHITECT.





THE GOVERNMENT HOUSE, RANGOON—MR. H. HOVNE FOX, A.R.I.B.A., ARCHITECT  
DETAIL OF CENTRAL FEATURE.





absolutely no possibility of any gases being generated in the pipes. This sanitary system, as designed by Mr. Hoyne Fox, was successfully carried out by Mr. A. Forbes, the manager of the Hygienic Plumbing Co., of Rangoon, who supplied all baths, lavatories, fittings, &c.

As far as style goes the building is rather a curious medley; whether its general design and character serve to emphasise the remarks we made the other day on the state of Anglo-Indian architecture, and on the result of leaving all important buildings to be carried out under the Public Works Department, is a point on which we will leave our readers to form their own opinion.

#### DINING-ROOM, PADDOCKHURST.

The exterior of this portion of the house was shown in the Academy last year and published in the *Builder* of September 11, 1897, with a plan. The room is 43 ft. 6 in. long and 22 ft. 6 in. wide and 15 ft. 6 in. high. The walls are panelled for part of their height with the finest solid Spanish mahogany, and above that is a plaster frieze representing the history of locomotion, designed and modelled by Mr. Walter Crane. The plaster ceiling was executed by Mr. Priestly, the chimney-pieces at either end of the room are executed in Pavonazzo marble and alabaster.

The mahogany panelling was executed by Messrs. Gillow, and the furniture for the room was also made by them; the carving was executed by Mr. W. Aumonier. The door furniture, in German silver, was executed by Messrs. Singer, of Frome. Mr. Aston Webb is the architect.

#### NEW TOWN HALL, GODALMING.

PREMIATED DESIGN.

In this design the Council Chamber forms the dominating feature towards the street, giving the façade a certain dignity and importance, while the general treatment is an unassuming one, suited to a small country town. It will be noticed that some attempt has been made to keep the character of the building on similar lines to the indigenous style of this part of the country.

The centre of the front would be executed in plaster on columns of Douling stone, and the roofs covered with Westmoreland green slates.

With regard to the general arrangement, the municipal offices have been placed in the front block and the court and its accessories behind; the latter being so arranged that it can be disconnected from the offices if necessary.

The public hall is an existing structure.  
LANCHESTER, STEWART, & RICKARDS.

#### SANITARY INSPECTORS' ASSOCIATION.

An extraordinary general meeting of this Association was held on Saturday last at Carpenters' Hall, London Wall. After the election of seven new members, including one from Neath, in South Wales, and two from Belfast, the first Irish members enrolled, the new Chairman of Council, Mr. T. J. Moss Flower, C.E., Surveyor and Inspector of Portishead (Bristol) Urban District Council, delivered his inaugural address. Setting aside technical subjects such as those frequently treated of in the addresses of his predecessors, the Chairman, mainly for the benefit of the younger members, briefly sketched the history of the Association from its origin in 1883, adding some suggestions tending towards the further development of its usefulness. The zeal of its early promoters Mr. Jerram (Walthamstow), Mr. Legg (Hackney), the first honorary secretary, Mr. Hugh Alexander (Shoreditch), Mr. Lukes (Gravesend) and other inspectors had won the support of the Sanitary Institute, and many of its foremost members, including the late Mr. E. C. Robins, Chairman of the first meeting, Sir Edwin Chadwick and Sir B. W. Richardson, the first and second Presidents of the Association. Its prosperity had continued under its third President, Sir John Hutton, L.C.C., until the forty inspectors on the first roll of membership had now expanded to 668. A desirable object to keep in view was an amalgamation with other similar Associations in England and Wales: the Midland and North Western with 340 members, and South Wales and Monmouthshire with 130 members, as well as with Inspectors' Associations in Scotland and Ireland. It could no longer be said that the affairs of the Association were entirely

managed by Metropolitan members, for a large proportion of the Council represented provincial districts, including its present Chairman, whose district was 140 miles from London. This nationalisation of the Association had brought with it increased cost of administration, although only the bare travelling expenses of country members of the Council were paid, and it had become necessary to consider whether the annual subscription of 10s., which included their excellent monthly journal, should be increased. The suggestion which had been made in one or two places that they were nearing bankruptcy was absurd in the face of the fact that they had upwards of 3,000*l.* invested, but the Chairman thought the income from the "Berridge Bequest" should be devoted to the special objects for which, as he believed, it was intended, instead of being applied to the payment of the current working expenses of the Association. Among such special objects might be included medals or prizes for the best papers read during the year. In the course of this short career 200 papers and addresses had been presented, and meetings had been held in a large number of towns. These addresses, together with the publication of their proceedings, and the interest awakened in public bodies in the towns visited, had done much to enlist public sympathy in the work of sanitary inspectors, but satisfactory as their progress had been, there was still much left to do. They had made no effort to bring in the young, and he thought they might with advantage organise a students' section. They ought also to try to build up a decent reserve fund, and, if possible, an emergency fund, and perhaps a benevolent fund. He had been thinking, too, that they might create a fellowship, to be granted to all members of from six to ten years' standing who chose to pay a higher subscription, which he suggested should not be less than one guinea and a half. In order that they might see themselves as others, who were competent to judge, saw them, the Chairman quoted from an article which appeared in the *Builder* of October 15, to which he thought the greatest publicity possible should be given. After giving the quotation, the Chairman added: "We should feel deeply indebted to the *Builder* for these sympathetic remarks, as it puts a part of our case in a way calculated to do us considerable service. It is very gratifying to receive recognition of this kind, and it shows the estimation with which our splendid work is being viewed." After referring at some length to the importance of two of the objects of the Association, superannuation of Sanitary Inspectors and security of tenure in office, the paper concluded with references to defects in, and the need for a consolidation of, the Public Health Acts, and to the decision of a judge of the High Court in a case recently given against the Walthamstow Urban District Council. In giving judgment, Justice Channell remarked, "If a public body comes to a person and either commences or threatens proceedings, such a person is no longer a volunteer. A person in such a position is under an obligation to do the work. It is immaterial whether the notice given to the plaintiff was a statutory notice or not. The law implies practical compulsion. In the present case there was no legal compulsion, but a more indirect compulsion is sufficient." If this decision should be upheld, perhaps the various public bodies would be more inclined to favour an alteration in the law upon the lines desired by Sanitary Inspectors.

An animated discussion followed on the motion of a vote of thanks, which was proposed by Mr. Dee, seconded by Mr. Grigg, and supported by Messrs. Alexander, West, Young, Foote, Thomas, and other members. The vote was carried by acclamation, Mr. Moss Flower replying to the observations made and returning thanks for the compliment.

A members' conference followed, when the balance-sheet and accounts were further discussed.

CHURCH INSTITUTE, CHESTERFIELD.—A Church Institute has been erected in the parish of Holy Trinity, Chesterfield. The building is situated in Newbold-road. There is provided accommodation for 350 persons, and the building comprises a large main hall and four class-rooms, which, can, if required, be turned into one large second hall. Kitchen accommodation is provided on the basement. Messrs. Rollinson & Son were the architects, and Mr. W. Forrest, Chesterfield, was the contractor.

#### LIABILITIES AND RIGHTS OF OWNERS IN RESPECT OF THE DRAINAGE OF BUILDINGS.

THE session of 1898-9 of the Auctioneers' Institute was opened on Tuesday at the Lecture-hall, Chancery-lane, with the reading of a paper by Mr. Alex. Macmorran, Q.C., upon "The Effect of Recent Decisions on the Liabilities and Rights of Owners in Respect of the Drainage of Buildings." Mr. E. Dobson, the new President of the Institute, occupied the chair.

The lecturer began by defining the terms drain, sewer, and cutirage, an important preliminary, because the duty of repairing and keeping in good order the drain devolved upon owners or occupiers, while the duty of repairing, ventilating, and cleansing the sewer devolved upon the Local Authority. The owner had the right to connect his drain with the sewer on condition of giving notice to the Local Authority, provided the connection could be made without trespass. A channel for receiving drainage, if it received such drainage from more than one building, was a sewer vested in the Local Authority, and it was none the less a sewer if it was laid in private ground. The decision in the case of *Travis v. Utley* in 1894 had opened the eyes at once of Local Authorities and the public to the importance of the distinction between the two terms. In that case a number of houses in a street which belonged to the same owner had, for each group of three houses, a drain common to each group, the drain from the third house in the group being connected with the main sewer laid in the street. The Local Authority having found defects in one of these common drains, ordered the owner to repair the defects. The owner refused to comply with the order, and his refusal was justified by the decisions, first of a magistrate and subsequently of the High Court, it being held that the common drain was a sewer vested in the Local Authority, which they were bound to repair. The drawback to this situation, from the owner's point of view, was that he must give free access to the authorities to his premises at all times and must not himself interfere with, and in Urban Districts he must not build over, the drain without the consent of the Local Authority. Several legal decisions had established the curious fact that, if a drain was secretly or even wrongfully connected with what would otherwise be a drain, this would be converted into a sewer and the Local Authority must perforce accept it and take charge of it as such.

It was also curious to find that in a case where a drain which was common to three houses, had once become a sewer, it was still a sewer even if two of the houses were cut off, and the drain only served for the single house remaining. Other legal decisions showed that in certain circumstances even an open water-course might become a sewer, and a pipe or conduit which merely drained off surface or rain water collected from different premises or different feeders into one main drain would constitute that drain a sewer, within the meaning of the Act. The importance of this was obvious in places where the separate system of drainage prevailed. Sewers made for profit formed a statutory exception, and remained private property, but a decision of Mr. Justice Romer in 1894 (*Minchard Local Board v. Luttrill*) was, in the words of the lecturer, "calculated to make the hair of the Local Government Board stand on end."

In that case a landowner, for the purpose of draining a town, the greater part of which stood on his own land, made sewers, and for the use of those sewers he levied and was paid a sewer rate by all persons whose houses were connected with his sewers. It was held that the sewers were made for profit, and were not vested in the local authority. A knowledge of the rights and liabilities of local authorities with regard to sewers was of evident importance to the owners of property. The owner might have a notice served upon him to abate a nuisance consisting of an alleged defective drain; but if he could show that that drain was in fact a sewer, he was clearly under no liability to comply with the notice, for the nuisance existed by reason of the act or default of the local authority in failing to perform their statutory duty.

In some cases notices were given in the belief that the defective drains notified were really drains and not sewers, but there was a widely spread suspicion that in other cases sanitary officers applied for such notices on



the chance of the owner being induced to do the work. In this connexion it was important to note the decision of Mr. Justice Channell in the case of North & Hillhouse v. Walthamstow Urban District Council, tried last month. In Section 10, Public Health Act, 1890, they had an attempt to amend the law with regard to the liability to repair defective drains by making the term "drain" include drains used for the drainage of more than one building; but this was "legislation by reference," a method that made references to numerous other cases necessary for a proper interpretation. In two recent cases, *Bradford v. Mayor, &c., of Eastbourne, 1896*, and *Seal v. Merthyr Tydvil, 1897*, more satisfactory decisions were arrived at, and these agreed with the interpretation put upon the section by the Lord Chief Justice and Mr. Justice Wills, which practically decided that if a channel for drainage which would otherwise be a sewer was on private land to which there was no access except to the owners, it was a drain and not a sewer.

A cordial vote of thanks to the lecturer was proposed by Mr. Field (ex-President) and seconded by Mr. Everill. A discussion followed, in which Mr. W. F. Noakes, Mr. H. Griffin, and Mr. Matthew Hale (Holborn Board of Works) took part. The vote was carried by acclamation, and Mr. Macmorran replied. A vote of thanks to the President brought the proceedings to a close.

#### THE LONDON BUILDING ACT, 1894 : THE TRIBUNAL OF APPEAL AND CONVERSION OF BUILDINGS.

THE Tribunal of Appeal sat at the Surveyors Institution on Wednesday to hear an appeal by Messrs. Potter, Sanford, & Kilyington, solicitors on behalf of Mr. James Cusack (under Section 79), against the decision of Mr. Edmund Woodthorpe, District Surveyor of the Northern Division of the City of London, by his letter to the appellant on July 7, in which he objected to the conversion of No. 12, Ropemaker-street, which was erected other than for a public purpose, unless staircases were built to comply entirely with Section 80 of the Act, and unless the roofs and floors were made fireproof throughout. The members of the Tribunal sitting were Messrs. Arthur Cates (Chairman), A. A. Hudson, and Penfold.

Mr. Coningham Glyn, barrister, appeared for the appellants, and Mr. Seager Berry, from the Building Act Department, for the London County Council and the District Surveyor.

Mr. Glyn explained that the premises in question were used by Mr. Cusack for educational purposes. As long ago as 1893, that gentleman extended his school, which was then at 2, Finsbury-street, so as to include 11, Ropemaker-street, which adjoined, and still later he conceived the scheme of converting No. 12 of the same street as part of his school. Thus the whole premises would be brought under one lease, and be used for tutorial purposes. Now, in regard to the "conversion or alteration" of the premises, he submitted that the conditions under which the scheme was being carried out did not admit of the conclusion that they were being "converted."

Mr. Seager Berry objected that, if such were the case, the appellants could not proceed with an appeal under Section 79.

The Chairman said it was clear that Section 79 clearly contemplated for the purposes of the appeal, a conversion or alteration. At the very outset Mr. Glyn submitted that there was no conversion or alteration; consequently the District Surveyor had no power, and there was no right of appeal to the Tribunal.

Mr. Berry pointed to certain rights the appellant had to magisterial proceedings.

Mr. Glyn said they were very reluctant to duplicate proceedings, and on further intimation from the Tribunal that they had no power to hear an appeal where one of the grounds was that there was no conversion or alteration the learned gentleman did not further press that argument, but enlarged upon the expensive nature of the work undertaken by Mr. Cusack and the adequacy of the staircase accommodation provided for. The building was, he remarked, only a public building through the inclusion of "places of instruction" in the definition clause of the Act, but not in fact. Mr. Cusack was perfectly willing to do what was reasonable, but he felt strongly that the District Surveyor was making upon him very stringent requirements, the necessity or propriety of which he left the Tribunal of Appeal to decide.

Two professional witnesses were called on behalf of the appellant. One of these, Mr. Collins, surveyor to Mr. Cusack, admitted that the whole building was, in the light of the Act of 1894, inadequate in its construction originally.

Mr. Seager Berry said the District Surveyor's requirements were stringent, but not more so than the circumstances of the case warranted. Criticising the character of the building, Mr. Berry dwelt upon the deficiency of staircases to the lecture rooms resorted to daily by 500 girls.

Mr. Edmund Woodthorpe, the District Surveyor, having given evidence.

The Chairman remarked that the Tribunal had formed a strong opinion upon the matter before them. They were not in favour of the appellant. They were quite content to leave it to the parties to withdraw the appeal, or to give their decision, or adjourn the case *sine die* with the view to some arrangement being come to.

Mr. Glyn said he for his part, would assent to the latter course.

The Chairman said they had not to forget that the building was daily visited by 500 young girls, and it was exceedingly desirable in the interest of an admirable institution that safety should be ensured. The members of the Tribunal had themselves visited and inspected the building, and several points occurred to them. They could not, however, embody these in a decision, nor could they be parties to a compromise as to the carrying out of the requirements.

Mr. Glyn assured the Tribunal that his client would make every endeavour to meet Mr. Woodthorpe's desires if that gentleman would also use his best endeavour to arrive at a compromise.

An order that the appeal be adjourned *sine die* was then made.

#### WEST OF ENGLAND BUILDING TRADE EMPLOYERS.

THE half-yearly meeting of the West of England and South Wales Federation of Building Trade Employers was held on Monday in the Council Chamber at Bridgewater. The President, Mr. H. W. Pollard (President of the local branch) presided.

Mr. H. W. Pollard (President of the local branch) welcomed the delegates, and the Mayor of Bridgewater (Mr. F. C. Forster) emphasised the welcome.

On the motion of the President of the Federation a vote of thanks was accorded to the Mayor and Corporation for the welcome they had extended them as well as for the use of the Council Chamber for their meeting.

The Secretary (Mr. H. J. Spear) read the half-yearly report. "The committee of the Federation," it stated, "strongly recommends members that, should any dispute arise in their district, the most speedy procedure towards a settlement is through the Board of Trade, provided the two parties consent to approach that tribunal, which can be done free of expense to the contending parties. Since the last meeting of the Federation, the Workmen's Compensation Act has come into operation, and has caused a considerable 'hue and cry' throughout the country. Many of the rates asked by the insurance offices were of a very extortionate character, but it is believed that the majority of builders have been treated in a very fair manner. Of course it is impossible, until the Act has been in operation for at least twelve months, to determine actually what risks and liabilities are covered by the policy, and what adequate premiums should be paid by the employers. It is pretty certain, however, that no giving satisfaction for even the legal profession, at its recent Congress at Swansea, passed a resolution condemnatory of its provisions. During the past six months the National Associations of Master Builders has been very actively engaged in the formation of a scheme for the federation of the United Kingdom, and the Act has no doubt this will be accomplished before the annual meeting of this Federation next May, and then, it is to be hoped, all the local associations will centre their strength upon the federation of their own locality, and thus further unity of action amongst all branches of the building trade. In conclusion, the committee cannot too strongly emphasise the importance of organisation in the building trade."

The Treasurer (Mr. J. Linton, of Newport) read the financial statement, which showed a small balance in hand.

The President, in moving the adoption of the reports, congratulated them on the freedom from disputes they had experienced in the last six months. Strikes and lock-outs were a disaster to the community. Speaking with regard to the Employers' Liability Act, he characterised it as a failure in a great many points, but they would have to bear with it, and he thought the chief difficulty would be to find the premium that would have to be paid to cover all risks incurred. With reference to the value of their federation, he thought it could not be over-estimated, and at the same time they should not only join themselves, but urge on their friends the desirability of their being members as well. He did not at all say that they should federate for the purpose of crushing their men. He did not believe in that. He believed in meeting them on a fair and common ground, and making a fair and equitable arrangement carrying on their business, so that they could hold their own in the future as in the past. He particularly condemned the class of employers who stood as free lances and then held aloof from disputes or joined in them when and where it suited their own selfish purposes. These were the black-legs of the trade amongst the masters, and he regretted also to the apprentice question, and suggested that they should endeavour to make their apprentice clauses as elastic as possible, and also to put on an apprentice whenever possible.

The meeting afterwards discussed a special form

of contract which had been agreed upon by the London Association with the Institute of Architects, and on the motion of Mr. W. Church, Bristol, seconded by Mr. E. Mudge, Exeter, it was decided that until a better form of contract emanates from the National Association that federation pledged itself to adopt this one wherever possible, or one based upon the conditions now in force by the National Association of Master Builders.

Mr. A. Krauss reported, as regards the federation scheme, that he was glad to say that since the West of England and South Wales Federation was started, a strong federation had been formed in the northern national centre, and also in the midland centre; the south-eastern was following, whilst the south-western, as far as he could see, had done good work. The National Association would shortly recommend the adoption of the Lancashire and Cheshire Federation rules as far as practicable in the formation of all federations. As to the apprenticeship deed, Mr. Krauss said the one drawn up and largely used could be had from the secretary for a few pence. Regarding the limitation of apprentices, that was a sore question all over the country; there was no time now to give them all the grounds, but that seven years in a fresh shop or going to "the unfair restriction imposed by the operatives, but he was glad to say they had none of that in Bristol. Their committee had gone fully into the question, and from information they found that limitation was very prevalent in the building trade. There was a scarcity of workmen in certain trades, and the limitation made it still worse. He had said before, and he said it now, that to meet that difficulty their present mode of apprenticeship was wrong towards the apprentice and wrong towards his parents. A lad fourteen or fifteen years of age should not be required to be kept to his apprenticeship until he reached the age of twenty-one. They would agree with him that it did not take seven years to make a lad an ordinary mason, bricklayer, plasterer, or even a carpenter and joiner. If anything was in an apprentice, and his employer or his foreman took an interest in the lad, in a very few years he was as good as most of their average workmen. If a lad was out of his apprenticeship at nineteen years of age, he could leave his employer, seek a fresh shop or go to another town, and on reaching the age of twenty-one he was a much better man in every respect than if he had been apprenticed for two years longer. He was sure it would raise the standard of workmen, and it would meet the scarcity of men in some trades.

The meeting subsequently discussed the limitations concerning apprentices, and it was decided to send round of a circular letter to certain associations on the subject.

Mr. A. Krauss then brought forward the subject of dividing the West of England and South Wales into three local associations—Bristol, Swindon, and Cardiff; but Mr. Blackburn, Newport, thought they were too young at present for that step. As they were now constituted, though their power was respected, if they were divided that might not be the case. Mr. W. Church, Bristol, agreed with this, and it was decided to leave matters as they are at present, but to try and stir up to fresh energy the smaller towns in the federation district.

It was decided to hold the annual meeting on the subject of "The Building Trade" at Exeter on May 14th next.

Votes of thanks concluded the proceedings.

The Conference, on rising, adjourned to the Bristol Arms, where they were the guests of the local Association at dinner. Mr. H. W. Pollard presided.

#### Books.

*Wells: The Cathedral and Sec.* By the Rev. P. DEARMER, M.A. London: George Bell & Sons, 1898.

THIS is another of the series of small books on the English cathedrals which Messrs. Bell & Sons are issuing. The author has produced a good account of one of the most interesting of our Cathedrals, and, in dealing with the large amount of material relating to its history, and the many points of interest in the building itself, he has wisely given the more prominent place to the latter. This method is the more desirable, as not only is the space necessarily limited in a book of this kind, which aims at providing a guide of a superior kind for visitors, but also because the history of the Cathedral, from its documents, has been already dealt with in more than one instance, and in recent times by the Rev. Canon Church, whose excellent work on the early history of the Cathedral we reviewed in the *Builder* of November, 1895. The work before us acknowledges and alludes to these authorities, and gives in a sufficiently condensed form the general points of the history of the building, adding in a final chapter a short history of the diocese and biographical notes on the bishops. Chapters I. and II. are devoted to a description of the exterior and



interior respectively, and throughout are admirably illustrated by a series of drawings and reproductions of photographs, the majority of which are excellent, and appear to have been taken expressly for the work—a great advance on the custom hitherto very often adopted in guide books of re-using blocks from other publications, often of questionable merit.

A plan of the cathedral and cloister is placed at the end of the work, and while it no doubt serves its purpose, it would have been rendered more valuable had a list of the monuments been given. They are shown on the plan, but no reference is given to them. We notice also that although the discoveries on the east side of the cloister are mentioned in the letterpress, the plan shows what was commonly supposed to have existed before these excavations had been made, and is, therefore, misleading. Another point in which an improvement might be made is in dealing with the exterior, not only of the cathedral, but also of the palace and other buildings surrounding it. In the hands of a visitor to the cathedral it would, we think, be found more useful to have the interior description of the cathedral itself following the account of the exterior, and the various points of interest in the palace and other buildings dealt with in a chapter to themselves.

Apart from these points, we can cordially recommend the book to those who in visiting the interesting City and Cathedral of Wells require a handy and trustworthy guide, brightly written and well illustrated, and at a price which brings it within reach of every one.

**Inspection of the Materials and Workmanship employed in Construction.** By AUSTIN T. BYRNE, Civil Engineer. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1898.

WRITTEN by an American, printed and published in New York, this book naturally deals with construction as practised in the United States, but nevertheless contains a great deal of information valuable to British constructors, and particularly to all who have to take the responsibility of determining the satisfactory nature or otherwise of building work. It is useful in giving tests for quality of materials as well as practical hints on the carrying out of building. In a book professing in a moderate compass to traverse the whole field of building construction, it is natural that some subjects will be better and more fully treated than others. In this respect, the book now before us may be specially commended for the very full and lucid explanation of asphalt in its various forms—its composition, its manufacture, and its use. Apart from the value of the work as a useful book of reference, it also possesses interest as giving us a comparison between British and American methods. Thus we are interested in noting that in the States there exists—what we are now trying to get—a standard size of brick, adopted by the National Brickmakers' Association and the National Traders' and Builders' Association, although the standard size appears to have been departed from in some localities. The size given by the author as the average of English bricks is not, however, that with which we are familiar in the metropolis and the South of England.

The grading or division into qualities of timber is also fairly placed on a better basis in the States than in England.

Useful tables of strength, weight, and other properties of material, as well as some of the more frequently needed mathematical tables, render the book valuable, not only to the student, but also to the practitioner, who may have passed the embryo stage.

**The Sanitation of Domestic Buildings.** By FRANK LATHAM, M.San.Inst. &c., Assistant-Engineer and Surveyor, Borough of Margate. With Introduction by BALDWIN LATHAM, M.Inst.C.E., F.San.Inst. London: The Sanitary Publishing Company.

IN the science of sanitary engineering the words of Mr. Baldwin Latham carry weight, and it was, therefore, with considerable anticipation of pleasure that we turned to a book prefaced by his warm commendation, "I can confidently recommend its perusal to all sanitary officers and others interested in domestic sanitation." Further reading, however, of the preface (not "introduction," passing under his name led us to wonder whether he must really be held responsible for anything

in it beyond the words of commendation and the signature. How else can we account for the following statements, that "Drainage and water supply arrangements . . . should be closely considered, so as to avoid on the one hand, the pollution of the water supply, and, on the other hand, the securing of a healthy habitation," and that drains "may have a difference of temperature within a very limited period of not less than 180 deg. Fah.?" Similar examples of carelessness are scattered throughout the book; on page 9 alone we have "Oates Green" instead of "Oates and Green," "Nalethrie" for "Nalethric," and a specimen of Queen's English which the proverbial schoolboy would find it hard to beat—"Messrs. Jennings' stone-wares pipes, judging from the large amount of work executed in this line by the firm all over the country with the most favourable results, is sufficient proof of the excellency of their manufacture." On p. 70 we are told that the *flth* in the pan of a pan-closet "holds water in the basin," but doubtless this is not what the author meant to say, nor did he mean to say (p. 71) that the D-trap under a pan-closet is "flushed through a fan spreader at the back," nor that a closet "upon being flushed is broken up and dashed . . . into the trap," but all these things he does say.

A writer who is so careless and inexact in his language can scarcely be accepted as a safe guide in other matters, and several examples could be quoted to show that this is the case. A few must suffice. On p. 10 it is said that 4-in. and 6-in. iron pipes with 8-in. crusts, and 9-in. pipes with 8-in. crusts, "should stand a test of between 400 ft. and 500 ft. of water." This would lead the reader to suppose that the three pipes are of the same strength, whereas a 9-in. iron pipe with a 4-in. crust is more than twice as strong as a 4-in. pipe of 8-in. metal, and more than three times as strong as a 6-in. pipe of 3-in. metal. It is better to coat with cement by exposing it to the air on a dry floor, rather than to mix it with water and then allow it "to stand awhile before use." It is a mistake to give less inclination to house-drains than is given by Maguire's well-known decimal rule; even these gradients are, in our opinion, too little, but gradients of 1 in 50 for 4 in. drains and 1 in 70 for 6 in. drains, as allowed by Mr. Latham on p. 21, while theoretically sufficient for drains flowing *not less than half full*, are in practice quite inadequate for house-drains, and especially for branch-drains from (say) water-closets, where the flow is intermittent and never large.

Other faults in the book might be mentioned, among them the omission of any mention of the boning-rod method of obtaining the required gradients of drains, but the game is not worth the candle. The book is interesting as a sign of the increasing attention which is now being given to domestic sanitation, and its preparation has doubtless been of service to the writer.

**Chemistry in Daily Life.** By DR. LASSAR-COHN. Translated by M. M. PATTON MUIR, M.A. Second Edition. London: H. Grevel & Co. 1899.

THIS book differs greatly from those elementary text books of chemistry with which we have become so familiar of late years. It is a book written in an unusually interesting manner, dealing principally with chemistry in its relation to the arts and manufactures. It embodies the substance of a course of popular lectures delivered by the author some years ago, but that it has been brought well up to date is evidenced by the fact that it discusses X-ray photography, and refers to the newly discovered substances, krypton, metargon, and neon.

The book is written in a style so simple and lucid that any one of ordinary intelligence can, without any previous scientific training, readily grasp its contents. It is not, however, of a description suitable for students studying for an examination; nor is it of any peculiar interest to builders, since the building materials, when mentioned at all, are necessarily treated in a very cursory manner.

As a readable elementary treatise on applied chemistry the book is unexcelled by any of the few similar publications.

**A Pocket Dictionary of Hygiene.** By C. T. KINGZETT, F.I.C., and D. HOMFRAY, B.Sc. London: Baillière, Tindal, & Co. 1898.

THIS is a very small book—really a "pocket"

\*The italics are ours.

book—containing, in alphabetical order, a short *résumé* of the heads of necessary information in regard to each subject named. For instance, under "Cubic space" we have notes on the requisite amount of cubic space for habitable rooms per individual; under "Cesspools," a summary of the requirements of the Local Government Board, with advice as to keeping them in a sanitary condition; "Duties of a Sanitary Inspector" are briefly summarised under letter D—(it should have been under S; "Sanitary Inspector—Duties of"); "Sewage," "Sewer-gas," "Slaughterhouses," &c., are each summarised in the same manner. A certain proportion of the contents, of course, is medical rather than constructional; but young architects will find the book useful, as a memorandum of what is required under each head, and where to look for it.

**Electrical Installation Rules. Special Risks Supplement.** Issued by the Liverpool and London and Globe Insurance Company.

THIS pamphlet is supplementary to the well-known electrical installation rules issued by the above company. These were necessarily very general, and the Company intend to issue from time to time supplementary rules dealing with special risks. In this issue the special precautions necessary in wiring corn, textile, and oil mills, theatres and music halls, and central stations, are considered. The rules, of course, confine themselves solely to fire risks, and they certainly should be read by all interested in the class of risk considered. Apparently fire insurance inspectors have a very poor opinion of the precautions taken against fire by the engineers at electric light stations.

**Guide to Round Timber Cubing Rule, and Round Timber Measurement Weight Tables for Railway Rates.** By E. A. P. BURT. London: Wm. Rider & Son.

THESE little volumes belong to that class of "labour saving" compilations which, when once made use of, seem quite indispensable.

When the railway companies published their new rates and charges in 1893 it was found that the timber trade, in common with most industries, had been hit very severely. The regulations governing the computation of the weight of timber were revised, and the alteration was strongly resisted. The representations made to the companies subsequently induced them to "generously meet the wishes of the timber trade," as Mr. Burt puts it, with regard to the system of measurement, though we believe that many of the rates themselves remain slightly advanced. Mr. Burt's tables show at a glance the weight of timber according to the different computations in general use. The author claims that by his arrangement of the tables "every tub is placed on its own bottom," and this probably explains a certain amount of apparently unnecessary repetition which is observable. The figures in tables 9, 14, and 15, for instance, are identical.

We have before had occasion to speak of the practical character of Mr. Burt's publications, and those under notice will certainly be found serviceable by the trade, the "Guide" containing much useful information in addition to that indicated by the title.

**Carpentry and Joinery.** By FREDERICK C. WEBBER. Methuen & Co. 1898.

OUR modern movement in favour of technical education is creating a literature which promises to be as voluminous as that of primary or secondary schools. The work now before us is one of a series of text-books of technology, edited by Professor Garnett and Professor Wertheimer, and is written with a view especially to the examinations of the City and Guilds of London Institute. It can, however, be with perfect confidence recommended as an admirable elementary text-book on the subject of which it treats, its especial value lying in the very admirable series of illustrations of wood construction which are given. The requirements of technical education as now understood cause the inclusion of some attempt to explain the methods of drawing and the more common problems of geometry and projection, as well as the mechanics of carpentry. These subjects are treated clearly and concisely; indeed, we may sum up by saying that lucidity and brevity are the chief characteristics of this book.



*Catalogue of Works Exhibited by Members of the Northern Art Workers' Guild, Manchester; with Chapters on the Crafts.* (Manchester: Chorlton & Knowles.)

THIS beautifully got-up "catalogue" has really a permanent value, the greater part of it being occupied by short and well written essays on various forms of artistic handicraft. Mr. Walter Crane contributes "Notes on Needle-work in the Present Century," Mr. Lewis F. Day writes on "Cotton Printing," Mr. W. Burton on "Pottery," Mr. H. Cadness on "The Craft of the Weaver"; there are several other such essays. Some of these, though short, contain a good deal of practical information on the subjects treated of; such as that by Mr. R. T. Hilton on "enamels," Mr. F. Foster, in treating on architecture within the compass of two pages, contrives to give a very good summary of the true functions of the art; and Mr. Edgar Wood, a Manchester architect who has taken much interest in the Guild, contributes some excellent remarks on the subject "From Nature to Design."

*King René's Honeymoon Cabinet.* By John P. Seddon, Architect. (London: B. T. Batsford, 1898.)

THIS is a book of description and illustration of a rather noteworthy piece of furniture, which is known to many architects in London, and which was exhibited at the 1862 exhibition, at the close of which application was made to purchase it by the South Kensington Museum authorities; it was, however, retained by the designer, Mr. J. P. Seddon, and last year was made over as a wedding gift to his daughter, Mrs. Birch, to whom it now belongs.

The general design of the cabinet is in the taste of one school of the Gothic revival, with much chamfering and inlay work in the stiff semi-French style which had then many admirers, Burges among the number. It would not in this sense appeal to the taste of the present generation of architects; but it is a powerful piece of work of its period. The panels were painted in oils by no less a trio of painters than Madox Brown, Rossetti, and Burne-Jones, with a series called "King René's Honeymoon"; photographs of each panel are given.

The cabinet was originally made simply as a piece of office furniture, to hold the owner's professional drawings, and to furnish an illustration of his theory "that in the unity and fellowship of the several arts lies their power." The present book is a kind of literary and artistic memorial of this interesting piece of work.

#### TRADE CATALOGUES.

"NOTES on Water Supply," by J. T. Rodda (King, Sell & Raiton), though a book form and not issued by any special trading firm, really comes under this heading rather than under that of "Books," as it consists merely of descriptions of various implements or patents connected with water supply, interleaved with advertisements and diagrams of the articles described and recommended. As a catalogue *raisonnée* of plant and inventions connected with water supply it is likely to be useful, especially as it is fully indexed.—Mr. W. Cassells (Kirkintilloch, Glasgow) sends us the illustrated catalogue of his patent "Clarifont" washing ranges. This is a contrivance to save time and, it is claimed, to economise water, in wash-basins for schools and public institutions. It consists of a range of earthenware basins each with a kind of second basin in the centre, somewhat like the crater of a lunar mountain; there are no taps, but when the basins are to be used the attendant turns on the water, which wells up from the bottom into the small centre basin, in which the hands are washed, and keeps overflowing into the outer channel or basin, whence it is carried off to the waste. The small basins are continuously full, and the water washed in is continuously carried away over the rim. There is no waiting to fill the basin, and it is stated that in this way each child in a school can wash his hands in thirty seconds and with the use of one quart of water. The economy of time is undeniable; we rather doubt the economy of water, but the "Clarifont" is quite worth the attention of architects employed on Board Schools and other lower and middle-class schools. It would hardly be accepted in high-class schools.—Mr. W. S. Merrikin (Hull) sends his catalogue of varnishes, paints, and

brushes, oil colours in collapsible tubes; "liquid jet" for coating stoves and other iron-work, which is stated to require no polishing and to be free from unpleasant smell; and "Duranium," a sanitary washable water paint made in all shades and tints, and suitable for either inside or outside work.—Mr. Archibald D. Dawney sends a convenient little pocket catalogue of sections and prices of steel and iron compound girders, with tables of safe distributed stationary loads in tons.—Mr. Frederic Barker (Wolverhampton) sends us an illustrated price list of his cabinet locks, for cabinets, cupboards, drawers, jewel-cases, &c.—The "Matchless" Gas Lighting Syndicate send us a description and illustrations of their automatic gas-lighter, which is intended to dispense not only with the use of matches or tapers for lighting gas, but also with the by-pass method. The description also with the aid of the sheet of the diagrams, is not very intelligibly given; but it seems a rather elaborate and delicate instrument, and we should hesitate to pronounce any decided opinion on it before having examined and made use of a specimen.—Messrs. Young & Co. (Westminster) send us a large and profusely illustrated catalogue of everything connected with stable fitting. The catalogue includes some excellent general rules and recommendations in regard to the planning and arrangement of stables, to which architects would do well to give attention. We can testify, from our own observation on stable plans, to the truth of the remark as to the frequent bad planning of loose-boxes in regard to facility in getting the horse in and out, from a desire to economise space. We are also entirely in agreement with them as to the sanitary improvement resulting from having wrought iron ventilating panels in the upper portion of the stall divisions, for the reasons given. The wall-lining for end stalls, so that the horse may not have a rough wall to rub against, is another good point. Other suggestions on the treatment of walls and ceilings in stables are worth attention; as also the means of ventilation proposed. The catalogue is a remarkably full one, and should be preserved by those who are likely to be carrying out stable buildings.—The United Asbestos Company send us their catalogue of "Salamander" decorations, illustrated from photographs of a number of modelled wall and ceiling coverings and other ornament, which show a variety of design and a fairly good artistic quality; but of course architects' own designs can also be carried out in this material, which has also important fire-resisting qualities. The same company also send us a catalogue of asbestos for use for practical purposes—fire-proof paint, mill board, packing for joints in pipes, &c.—the "Gladiator" packing for marine and land engines, piston packing, and for many other purposes.—The Bosted Pneumatic Tube Company (London, New York, and Chicago) send us a catalogue of pneumatic tubes for cash-carrying, &c., in substitution for and as an improvement on the "overhead railway" system used in some large establishments. That they are an improvement on that system we have little doubt, though the style of the catalogue has a little too much of the "spread-eagle" about it.

#### BOOKS RECEIVED.

REPORT OF THE CHIEF LABOUR CORRESPONDENT ON STRIKES AND LOCK-OUTS: Board of Trade Labour Department. (Eyre & Spottiswoode.)

THE STONES OF VENICE. By John Ruskin, LL.D., D.C.L. New Edition in small form. Vol. III. (George Allen.)

PUBLICATIONS OF THE BRITISH FIRE PREVENTION COMMITTEE.—Vol. I. (Published by the Committee.)

EGYPT EXPLORATION FUND: Archaeological Report 1897-1898. Edited by F. L. Griffith (Kegan Paul & Co.; Bernard Quaritch; Henry Frowde.)

EXHIBITION OF LITHOGRAPHS.—The Loan Exhibition of Lithographs which has been organised by the Department of Science and Art, at the suggestion of the Society of Arts, to commemorate the centenary of the invention of lithography by Alois Senefelder in 1798, will be opened on Monday, November 21, and will remain open until February 28 next. The exhibition has been arranged in a building adjoining the Machinery Section, Southern Galleries, South Kensington Museum (entrance on the west side of Exhibition-road). The public will be admitted, without payment, at all hours when the museum is open.

## Correspondence.

To the Editor of THE BUILDER.

### GODALMING TOWN HALL COMPETITION.

SIR,—In your last week's issue a letter appears in reference to the above, that, while purporting to quote the conditions of competition, in reality re-constructs them somewhat, thus (doubtless unintentionally) conveying a false impression. The clause referred to reads as follows:—

"A passage is required along the south side of the present Public Hall, as indicated on block plan, and if the fire-engine shed is built on the back land, this passage will be required to be at least 10 ft. in width, in order to allow of fire engines being got in and out. If, however, the engine house is erected facing Bridge-street, a passage 6 ft. in width will be sufficient."

Our design made this passage over 6 ft. wide, and provided in addition a 10-ft. way parallel to it for the engines. Surely to any one using common sense this fulfils the requirements of the above clause. Last week's communication suggests that our design omits to provide the way into Bridge-street for the engines.

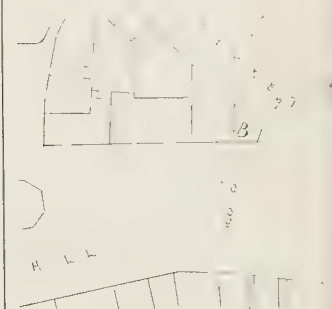
LANCHESTER, STEWART & RICKARDS.

\*\* What we said in our comment on the letter of "A Competitor" was that, according to the statement in the "Answers to Questions," the 10-ft. passage in the position referred to is obligatory on competitors. It unquestionably reads so. The Committee demanded a passage in the position coloured yellow on the plan, viz., through the centre of the site; the only thing that was optional was that it might be narrower than shown, if the engine house were not at the back of the site. According to all logical reading of the "Instructions," the central position of the passage was compulsory. If the Committee meant that the position of the passage was optional, so long as it was provided somewhere, they should have said so. They did not say so; and therefore that position was binding on the competitors. As a general rule we are by no means ready to print letters from unsuccessful competitors complaining of unfair treatment—such complaints are often made on very futile grounds; and in this case we declined to print the letter unless the printed Instructions and Plan were sent in for our inspection; but a consideration of them left us in no doubt whatever as to the sense in which the Instructions and Plan, taken together, which the Instructions and Plan, taken together, must have actually been chosen; but unfortunately its choice involves, under the circumstances, a technical injustice to the other competitors.—ED.

### MODEL BY-LAWS AND LOCAL REQUIREMENTS.

SIR,—Your comment in your issue of the 29th ult. on the inelasticity of the model by-laws raises a point on which considerable inequality and hardship exist in many old towns.

I send you a tracing of the centre block of this town, whereby it will be seen that the open spaces are very considerable and that the buildings at points A, B, and C have unlimited aid and light all round them, and yet, under the model by-laws, if they were burnt down, they could not be rebuilt. On the occasion of a visit of a Local Government Official, some years ago, I pointed out particularly the case of site B, and showed that, with its road of 100 ft. wide on the one side, 53 ft. on the



other, and unlimited space in front, it was a case not only of hardship to the owner, but of detriment to the town if this building would have to remain a ruin because of the impossibility of giving it the enclosed yard demanded by the by-law. The reply was to the effect that it was impossible to carry out hope was held out that a case like this could be dealt with on its merits. Many other sites in these blocks would, in case of a general conflagration, be rendered



quite useless, and while some of them would be the better for more air space, others, like that which I have mentioned at length, are well provided for in that respect, although they do not meet the requirements of the by-law.

When we consider that in the Metropolis these places could be again built upon, it does seem absurd that in a comparatively small country town the District Council would either have to break its own by-laws, or commit the absurdity of rejecting all the plans for rebuilding. If it is not considered desirable to entrust a District Council with discretionary powers, surely a County Council or Local Government Board official could deal with exceptional cases of this kind.

Alnwick.

GEORGE REAVELL.

## The Student's Column.

### SOUND, LIGHT, AND HEAT.—XIX.

#### LIGHT: REFLECTION.

**T**HE laws appertaining to the reflection of light are, practically, the same as those for heat. When a ray of light falls on a polished surface it is reflected as follows:—

1. The angle of reflection is equal to the angle of incidence.

2. The incident and the reflected ray are both in the same plane with the perpendicular to the reflecting surface.

In regard to multiple images formed by glass mirrors Ganot remarks (*Op. cit.*, p. 510) that whenever light is transmitted from one medium to another, only some of the rays get through; the remainder are reflected at the surface bounding the two media. The student will remember that almost the same effect results from the reflection of sound when a sonorous beam is passing through media of different densities. The multiplicity of images is objectionable in observations, and, accordingly, metal mirrors are much to be preferred for accurate scientific work.

In spite of the general laws of reflection, just enunciated, it is known that the light incident on an opaque body separates into three parts, viz., one part is regularly reflected according to those laws, another is reflected in all directions, whilst the third is absorbed by the body on which it falls. That part which is scattered in all directions is known as scattered or diffused light. Ganot observes, that the light which is reflected regularly, does not give us the image of the reflecting surface, but that of the body from which the light proceeds. If, for example, a beam of sunlight be incident on a well-polished mirror in a dark room, the more perfectly the light is reflected the less visible is the mirror in the different parts of the room. The eye does not perceive the image of the mirror, but that of the sun. If the reflecting power of the mirror be diminished by sprinkling on it a light powder, the sun's image becomes feebler, and the mirror is visible from all parts of the room. Perfectly smooth, polished reflecting surfaces, if such there were, would be invisible. The beam of light itself is only seen in the room owing to irregular reflections from the particles of dust, and the like, which are floating in the air. Tyndall has shown that when this floating matter in the air in an enclosed space is completely removed the beam of sunlight or the electric light is quite invisible. The atmosphere diffuses the light which falls on it from the sun in all directions, so that it is light in places which do not receive the direct rays of the sun.

From what has already been said, it is evident that the intensity of the light reflected is always less than that of the incident light; the intensity increases with the obliquity of the incident ray.

A practical application of reflection from the surface of a flat mirror is employed in the measurement of small angles. In one instrument for this purpose the mirror being carefully adjusted in position by means of a telescope is made to reflect a spot of light which is seen at one end of the object to be measured; the source of the spot is then caused to move with the mirror whilst the latter is slowly revolved until the light spot arrives at the other end of the object. By a simple contrivance the number of degrees through which the mirror has been turned, which also gives the measurement of the desired angle, is readily ascertained. Another practical application is the heliograph, for reflecting light to distant stations; the signal-glass can detect the mirror through a very

small angle either to the right or left, and the observer at the distant station sees corresponding flashes, so that a code being arranged messages may be flashed over long distances. In a similar manner the electric search light is also utilised for flashing signals either direct or by reflection from the clouds.

The reflection of light from curved surfaces is not quite so easy to understand—at any rate, at the first glance. Curved mirrors are of various kinds, but those most frequently used are either spherical or parabolic. One of the prime objects of the curved concave mirror is to collect the rays of reflected light into a single point, and to intensify the light at that point; or, a number of rays may be reflected to different foci, so that there shall be several points of "intensified light" from one mirror when the reflecting surfaces of the mirror shall be arranged accordingly.

In reference to parabolic mirrors reflecting on the concave surface, all rays parallel to the axis after reflection meet in the focus of the mirror, which is situated in the centre of, and near the surface of, the mirror. On the other hand, when a light is placed in that focus, the rays incident on the mirror are reflected parallel to the axis. Light thus reflected maintains its intensity for a great distance. Practical applications of the parabolic-reflector are in lighting dark staircases and passages. By an arrangement of two or more such reflectors the rays from a single light may be reflected in different directions, as required. This form of reflector is also used in carriage lamps, and for the head and tail lights of railway trains.

Perhaps the greatest use of the parabolic reflector is for lighthouse purposes, though in lighthouses of the first order the method is now largely superseded by lenses, as will hereafter be described. In 1867 the parabolic metallic reflector was used in 180 lighthouses in the United Kingdom, or about one-half of those erected at that date. The idea of its application to sea-lights, however, dates back to the year 1784, following on the discovery of the cylindrical burner with its double current of air. It was found that the chimney of that burner which was essential to perfect combustion, served likewise the indispensable purpose of carrying off the gaseous products, which, in previous forms of lamps, by tarnishing the surface of a reflector, rendered its adoption quite useless. Argand, about the year mentioned, perceived the applicability of the parabolic reflector for sea-lights. Quite independently, the engineer of the Northern Lights Board, made a parabolic reflector of facets of silvered glass fixed in a plaster mould, which was erected in 1787 at Kinnairdhead, in Aberdeenshire.

Brewster\* showed how much greater is the loss of power when rays are reflected from a metallic surface, especially if hammered into shape (as in the case of the ordinary parabolic reflectors then in vogue), than when transmitted through glass lenses or prisms of moderate thickness.

Mr. J. T. Chance, C.E., observes† that apart from these considerations the lighthouse reflector gives place to the dioptric instrument for two other reasons mainly. First, the parabolic mirror irremediably causes great waste of light, and therefore of oil, by useless divergence; secondly, it is only by an enormous multiplication of reflectors, far beyond what, in the presence of a better system, engineering principles would justify, that the power of dioptric sea-lights can be rivalled. Theory and experiment concur in this result.

Mr. Thomas Stevenson placed a lenticular front upon the parabolic mirror, so as to condense the cone of light which would otherwise pass off in its natural state of divergence; and in place of the corresponding back portion of the reflector, he substituted a spherical metallic mirror, which returned the flame upon itself though inverted. Let it be assumed that, with this modification of Mr. Stevenson, the proportion of the luminous sphere, which the parabolic mirror and its adjuncts condense, is equal to that which is embraced by a complete dioptric instrument; still the defect of wasteful divergence remains. Mr. Chance (*Op. cit.*, p. 495) remarks that there is a practical limit to the dimensions of the reflector; and perhaps it would be found inexpedient to extend the size beyond that of the Scotch instrument, the aperture of which had a diameter of 25 in. If, again, with a given maximum size of reflector the diameter of the burner be enlarged with

out the introduction of a further wick, there will be a corresponding increment in the divergence of the beam, but very little, if indeed any, addition to its mean intensity.

In order to obtain an intensity of illuminating power at all approaching that of a dioptric instrument of the higher orders, there was no resource but to multiply the number of the separate reflectors. For the purpose of estimating the exact multiplication of reflectors which would be required, recourse must be had to experiment. M. Fresnel drew up an elaborate account of the comparative advantages of the system of metallic reflectors and dioptric instruments for sea-lights; and a later author, M. Reynaud, made a very careful comparison, based upon actual photometrical observations. He showed that a Fresnel light of the fixed kind, even of the second order, can be equalled by reflectors only by multiplying them to the number of sixty, each giving about the same quantity of light in the horizontal plane as the English reflector; and that the consumption of oil would be seven times more in the employment of these reflectors than in the case of the dioptric apparatus. In England a fixed light of reflectors had them, generally, in the proportion of 24 to 27 in number for 360 deg. Yet, even with all this multiplying of reflectors, the perfection of uniformity in the distribution of light over the horizon, which accompanies the fixed dioptric light, cannot be imitated by parabolic mirrors.

From the foregoing estimate of the number of reflectors required for an apparatus which would be equal in power and general effect to a first order dioptric fixed light, it may be calculated, approximately, what arrangement of reflectors would be necessary in order to produce the effect of a first order (1867) dioptric revolving apparatus.

### GENERAL BUILDING NEWS.

**OLD GREYFRIARS CHURCH, ABERDEEN.**—The plans for the restoration of this structure, prepared by Mr. A. Marshall Mackenzie, A.R.S.A., architect, Aberdeen, have now been approved of by the authorities of the University of Aberdeen, the Greyfriars Kirk-session, and the Presbytery of Aberdeen, and will next be submitted to Aberdeen Town Council for their sanction as heritors. It is considered unlikely that such sanction will be obtained, as most of the Town Councillors would prefer that the old church be removed altogether and a new one built on a different site, in accordance with the scheme for the extension of Marischal College buildings ratified by Act of Parliament.

**ST. JOHN'S CHURCH, ABERDEEN.**—A new aisle at St. John's Episcopal Church, Aberdeen, erected from plans by Mr. A. Clyne, architect, Aberdeen, was opened and dedicated last week.

**CHURCH, BROMLEY.**—The consecration of the new Church of St. Mark, Bromley, which has been built on a site at the junction of Sandford and Westmoreland roads, took place on the 22nd ult. The church consists of chancel, having space for an organ, and choir and clergy vestries, with heating chamber below on the north; it is intended to build a side aisle, having accommodation for about sixty persons, at a future date on the south side of the chancel. The church has seating accommodation for 582 persons. The nave is of five bays, divided from the chancel by a chancel arch, and from the north and south aisles by arcades with clearstories above. At the west end of the nave is a gallery, having a stone screen, and approached by a stone staircase in the south-west lobby. The tower is placed at the north-west corner, and is separated from the nave by the north aisle; the lowest stage forming a porch. The main entrance is in the west face of the tower, with inner doors into the north aisle. Secondary entrances and exits are placed at the west end of the south aisle, and the east end of the same aisle. The latter entrance is intended more to serve the future chancel aisle than for present use. The external work is faced with red brick, Douling stone being used for tracery of windows, copings, &c. Internally the walls are plastered, the arcades and dressings being in Douling stone. Owing to the low level of the site, the nave floor has been kept some 4 ft. above the natural level of the ground. Messrs. Powell & Sons have, in conjunction with the architect, arranged a scheme of stained glass to fill the windows, to be put in hand as opportunity offers. The aisle windows of the nave will be filled with subjects representing the Life of our Lord. The first of these, "The Visit of the Shepherds and the Wise Men," is being given by Mrs. Aitken, and is now being painted. The tower window will not be carried at present beyond the lowest stage; when complete the parapet will be about 80 ft., and the vane about 114 ft. above the ground. Messrs. Crossley & Son, of Bromley, have been the general contractors for the work, and have also made the nave seats, sedilia for the clergy, &c. The carving has been done by Messrs. Farmer & Brindley, who also made the choir stalls, the lectern, and the font. The heating

\* Trans. Roy. Soc. Edin., vol. xi., 1831.

† Min. Proc. Inst. C.E., vol. xxvi., 1867, p. 494.



standards or lamps, and are surmounted by wrought-iron frames and electric lamps. At the foot of each angle of the tower are carved groups of horned animals suggested by the crest of the donor. On the north side is fixed the existing cattle trough, and on the south side another cattle trough, both executed in granite. On the east is placed the fountain for wayfarers, also of granite, and on the west side is the door for access to the tower. Above the troughs on three sides are moulded recesses corresponding with the opening of the fourth for the door, with hood moulds, ke-



stones and cornices over, richly carved. Over the new trough is the bronze commemoration tablet, which bears the following inscription:—"Erected in the sixtieth year of the glorious reign of Victoria, Empress Queen, to perpetuate the beneficent work of William Miles, Esq., of this city, on behalf of the animal creation, by his widow, 1867," with two bulls in bronze at the base containing the water issuing from the ejet pipe. On the opposite side of the monument the old trough Mr. Miles' coat of arms and his motto, "Ut Miles Obsta," has been carved in a large stone panel. Over the fountain for wayfarers is another carved panel with the text, "The fear of the Lord is a fountain of life," over; and at the base is a griffin in bronze from which the water issues. The clock chamber, at the top of the tower, is square on plan, and projects somewhat beyond the face of the shaft. The clock faces, of which there are four, are 4 ft. 6 in. in diameter, and have projecting hoods. The clock chamber is surmounted by an octagonal cupola, in which will be fixed the bell upon which the clock strikes, and the whole terminates with a wrought-iron and copper vane. The carving has been executed by Mr. F. J. Easton & Sons, generally has been carried out by Messrs. J. Easton & Sons, Exeter, from the design of Mr. T. A. Andrews, the architect.

**THEATRE ROYAL, PRESTON.**—The new Theatre Royal, at Preston, is built on the site of the old one, at Fishergate, by Mr. W. Johnson, from the designs and under the personal superintendence of Mr. John S. Briggs, architect, of London. Mr. S. King Sheldon has acted throughout as clerk of the works, the general foreman being Mr. F. Coward. The following are the names of the principal firms engaged in the construction and fitting up of the theatre:—General contractor, Mr. Charles Walker, Preston; artists and decorators, Mr. Beekinder, Preston; electric lighting, Mr. C. E. May, and subsequently the erection of a new administrative building, a ward pavilion, an isolation block, a discharge block, porter's lodge, and new disinfecting station, was commenced, the tender of Messrs. J. & Son, Horsham, for 10,775s. being accepted. The buildings are of red brick, relieved by Portland stone dressings. The exterior walls are built hollow. The isolation pavilion contains one large ward, 28 ft. long by 24 ft. wide, five small wards, each 24 ft. long by 14 ft. wide, and three nurses' rooms, while in the scarlet fever pavilion there are two large wards, each 60 ft. by 26 ft., two small wards, 15 ft. square, and one nurses' room. The administrative building contains store-rooms, sitting-rooms for matron and staff, kitchen, bed-rooms, &c., and apartments with separate entrance for the resident medical officer. A new disinfecting chamber has been erected in the rear of the administrative block, with two steam disinfecting apparatus. The ground works, roads, &c., were carried out by the Corporation, who were known under the highway inspector, Mr. Grant, and Mr. J. Wright was clerk of the works.

**THE COUNTY BUILDINGS, NORTHAMPTON.**—At a recent meeting of the Northamptonshire County Council, the Building Committee recommended the adoption of plans prepared by Mr. Aston Webb for alterations and enlargements of the existing County Buildings at Northampton. By these plans such parts of the existing buildings as have any architectural or historical interest will not be altered, nor will the façade be touched except for the interchange of a doorway and window on the ground floor. The Courts will remain as they are and so will the main wing, which contains the Grand Jury room, but the modern buildings at the back between the main buildings and the County Council Chamber will be pulled down. The main entrance will be removed to the western extremity of the wing. The alterations will provide more rooms and offices, all more conveniently placed, and accommodation will be given to the police department. The estimated cost of the alterations will be 15,000l., and the committee recommend that Messrs. Aston Webb and E. Ingress Bell be appointed architects for the erection of the buildings.—*Northampton Reporter.*

**MUNICIPAL LODGING HOUSE, ABERDEEN.**—The new Corporation lodging-house consists of three four-story blocks, the intermediate buildings being only one flat high. The architects, who were chosen in competition, are Messrs. Marshall & Dick, Newcastle-on-Tyne. The building has a frontage to East North-street (which has been widened about 20 ft. at the place) of 95 ft., is 112 ft. deep, and the height to the apex of the roof is 53 ft. 6 in. Access to the main corridor on the ground floor is gained by three steps. On the left hand on entering are the

superintendent's house and office, behind this are the kitchen and dining-room, measuring together 40 ft. square. To the rear of this are boiler-house, disinfecting store, covered ways, private washing-house, lodgers' wash-house, ironing-room, and foul-linen shoot. On the right of the main corridor on the ground floor is a combined reading and recreation room, 42 ft. by 36 ft. The reading-room has a concrete roof and is lighted by a cupola. Behind this are bath and lavatory accommodation, boot-room, and clothes-changing room, with open yard, beyond which are seven porcelain urinals and a range of seven of Shanks' patent closets. In the background is a workshop for the lodgers. There is also a detached building for storing vendors' carts, barrows, &c., or barrel organs. There are 252 cubicles altogether—87 on first floor, 87 on second floor, and 78 on third floor, where there is also a sick-room. Each cubicle measures 6 ft. 9 in. long by 4 ft. 6 in. wide. On each floor there are two water closets with urinal combined, warder's bedroom, scullery, linen store, access to foul linen shoot, and access to lift for receiving clean linen. All the lavatories are tiled. The walls of the kitchen and dining-hall with the scullery are also tiled. There is one of Kennedy's drinking fountains in each lavatory and one in each corridor at the different stair landings. There is also a heating coil at each stair landing. The staircases are of Abroath stone, the corridors are paved with concrete, and there are two hydrants in each flat. The cubicles are of St. Petersburg red wood, and the internal finishings, doors, &c., are of yellow pine. The total cost will be about 13,000l. Mr. John Ogilvie has acted as Inspector for the Town Council, and the contractors are:—Mason, Leslie Smith; carpenters, Leslie & Hay; plasterers, J. Bannochie & Son; plumber, A. B. Robertson; painters and glaziers, G. Donald & Sons; slater, G. Davidson, jun.; electric light (all through the building), J. C. Middleton & Co.; heating, R. Tindal; lift, J. M. Henderson; glazing, Mason & Son—all of Aberdeen.

**HUNTER-STREET, BLOOMSBURY.**—A block of residential flats is about to be built on the sites of Nos. 5 and 6, Hunter-street, and No. 8, Handel-street, Mr. A. Whitcombe being the architect. The contractors are Messrs. Perkins & Co., of No. 154, Great Titchfield-street, W.

**BUILDING IN LEEDS.**—The aspect of Briggate, the principal thoroughfare of Leeds, is about to be further improved. Some time ago the old commercial hotel, the "Bull and Mouth," and some adjoining property was purchased, and the estate is about to be developed by the City of Leeds Central Estates, Limited. The Briggate there will be a frontage of 120 ft., and to Kirkgate one of 121 ft. Backward from Briggate, the estate extends to within 40 ft. of New Market-street. The buildings upon the ground are very old, and at the rear consist of dilapidated cottages and sheds. The whole is to be swept away, and entirely new buildings erected. The promoters hope that in carrying out the scheme the Corporation will see their way to make a new street from Duncan-street to Kirkgate, 42 ft. wide—a continuation of the recently constructed thoroughfare known as Central-road. For this purpose no less than 1,000 yards of the ground is offered by the company, and negotiations with a sub-committee are now going on. This new thoroughfare, should an agreement be effected, will form an additional avenue to the markets. Plans of the new structures have already been prepared. The new buildings will comprise a hotel, a large emporium, and a number of shops and warehouses. The Briggate frontage will be in the French Renaissance style, and rise six stories. The main entrance to the hotel will be in Briggate. It will be approached through a colonnade 75 ft. long and 20 ft. wide. This will lead directly to a large central hall, 94 ft. long and 30 ft. wide, with a balcony running round the first floor level and a lantern roof. On the ground floor will be a buffet, 75 ft. by 25 ft. The ball-room will be 90 ft. long by 45 ft. wide, and 25 ft. high. In the basement will be situated a billiard saloon, 90 ft. by 45 ft. with six tables. The public bedrooms will number 130. The emporium will have a frontage to Briggate of 74 ft., an area of 95 ft. by 75 ft., and a large lantern roof. Four or five tiers of galleries will run round the interior. The basement will be constructed so that it can be flooded to a depth of 2 ft., and that gondolas may sail hither and thither. The establishment will be on the lines of Lewis's emporium in Liverpool. A promenade will overlook Briggate. The new shops and warehouses are to number twenty-one. Each will have a frontage of about 18 ft. At the rear the old Red Lion Hotel, now approached from Kirkgate, will be rebuilt. The architects are Messrs. J. Holmes Greaves & Co. of Leeds.—*Leeds Mercury.*

**THE NEW THEATRE, NORWICH.**—Tenders have been invited for pulling down the Norfolk Hotel and premises adjoining in St. Giles', preparatory to the work of building the New Theatre on the site. The architects are Messrs. Boardman, of Norwich.

**ASYLUM EXTENSION, UPTON, NEAR CHESTER.**—An addition to this building was opened on the 31st ult. The new wing, in addition to an administrative block for the whole institution and another block for attendants, affords accommodation for over 400 additional patients. The architects were Messrs. Grayson & Ould, of Liverpool, and the

builders Messrs. Jones & Sons, of Liverpool. The buildings are faced with Edwards's Ruabon bricks. The warming and ventilation is on the plenum system, and the work has been carried out by Messrs. Ashwell & Nesbit, of London. The electric plant and lighting has been supplied by the Liverpool Gas and Electric Fittings Company. Messrs. Cochran, of Liverpool, have fitted up the kitchen ranges and the steam cooking apparatus. Messrs. Doulton & Co. have supplied the sanitary fittings, and the Chester Waterworks Company have put in the fire hydrants. Mr. J. Beveridge acted as clerk of the works.

**LIBERAL CLUB, BIRKENHEAD.**—The new Town Liberal Club, Cloughton-road, Birkenhead, has just been opened. The elevation of the building in Cloughton-road is faced with red Ruabon bricks from the works of Mr. J. C. Edwards, Ruabon. The principal entrance from Cloughton-road opens into a hall, 15 ft. by 12 ft., the floor of which is laid with encaustic tiling, by Mr. Geo. Swift, of Liverpool. On the right are the secretary's office, the principal staircase, and the refreshment bar; on the left is the reading-room, 17 ft. by 13 ft., and at the end the billiard-room, 40 ft. by 25 ft. Beyond the billiard-room are situated the gentlemen's toilet-room, the committee-room (with separate entrance from Greenfield-street), and a secondary staircase giving access to the green rooms, &c. A mezzanine floor contains a ladies' toilet-room and a cooking kitchen. The entire first floor is occupied by the lecture hall, with its stage and two green-rooms. The lecture hall is capable of accommodating about 400 persons. The stage is 20 ft. by 12 ft., and the green-rooms communicate directly with the hall and with the secondary staircase, and are provided with fireproof floors. From the lecture hall access can be obtained to a small balcony. Adjoining the club premises, and communicating with the same at the rear, is a residence for the keeper. The buildings have been erected from the designs of Mr. Thomas Cook, architect, of Liverpool, the contractor being Mr. Peter Rothwell, of Birkenhead, and the sub-contractors as follows: masonry, Mr. W. H. Grice; plumbing, Mr. Robt. Robinson; slating and plastering, Messrs. Henry Johnson & Sons; glazing, Messrs. Lackland & Co. The premises are fitted throughout with the electric light by Messrs. New & Bird; ventilation apparatus by Messrs. J. R. Cooper & Sons; communication between the lecture hall, the cooking kitchen, and the refreshment bar is obtained by lifts.

**FREE LIBRARY, FLASHET, EAST HAM.**—The foundation stone of a free library was laid at Flashet on the 6th inst. Mr. Silvanus Trevelin, of London and Truro, is the architect.

**PUBLIC LIBRARY, ST. GEORGE'S-IN-THE-EAST.**—A new public library has just been opened at St. George's-in-the-East. The site has a frontage of 49 ft. to Cable-street, and a depth of 95 ft. The builders were Messrs. W. Johnson & Co., of Wandsworth, and the architect was Mr. Maurice B. Adams, of Chiswick.

**LIBERAL CLUB, NORTHAMPTON.**—On the 7th inst. the Marquis of Northampton opened the new Northampton Town and County Liberal and Radical Club in St. Giles'-street, Northampton. The frontage to St. Giles'-street is given up on the ground floor to three lock-up shops, above which is an assembly hall. The exterior of the building is of red bricks with yellow Weldon stone facings to openings and gables. The roofs are covered with Penryn green slates; and the dome on the tower, at the angle of the two frontages, is covered with lead. On the ground floor are the entrance and staircase halls and corridors, a reception-room, a dining-room, a library, buffet, &c. The halls are provided with panelled dados, with Fawkes' enriched mouldings. The first floor is reached by a stone staircase, lighted by the window which is a feature of the Castilian-street front. The reception-room is on the left of the entrance. The dining hall is in communication with the refreshment buffet. The library and the buffet look out to Castilian-street. On the first floor, at the head of the main stairs, is the entrance to the assembly hall: the hall is capable of seating 250 people. It is provided with a platform and stage entrance and retiring-rooms. There is an extra stair at the end running direct from the hall to St. Giles'-street. On the main landing is a card-room, and at the end a billiard-room and an annex for conversation, cards, &c. The upper story of the tower is utilised for an additional card and smoke room. The apartments for the caretaker are at the rear. The rapid fall in the level of Castilian-street has been taken advantage of by the architects in forming half-basement lavatories and cellars, and for the heating apparatus. All the corridors and halls are heated by American low-pressure radiators. The contractors were Messrs. Wilson & Alright, of Northampton, and the work has been carried out under the personal supervision of the architects, Messrs. Mosley & Anderson, of Northampton.

**ELECTRIC LIGHT AT LLANDUDNO.**—At Llandudno, on the 5th inst., a system of electric lighting for the town was switched on for the first time. Mr. A. H. Preece was the electrical engineer, and the scheme has been carried out at an outlay of 25,000l.



## SANITARY AND ENGINEERING NEWS.

**SEWAGE SCHEME, SHREWSBURY.**—The ceremony of laying the foundation-stone of the new pumping station in connexion with the scheme for the disposal of the sewage of Shrewsbury took place on the 28th ult. Messrs. John Taylor, Sons, & Santo Crimp are the engineers; and Mr. Henry Price is the contractor.

**ENLARGEMENT OF THE WATER WORKS, PORT GLASGOW.**—On the 20th ult. the last copstone was laid at the filters consisting of Partshill. The new works, which were designed by Mr. James Wilson, C.E., Edinburgh, and cost 4,000*l.*, are in close proximity to the filters and pure-water tank, which had proved inadequate for the increased and growing requirements of the burgh and district. The contractors were Messrs. D. Cunningham & Sons, Kilbarchan.

**BRIDGE, SOUTHWOLD.**—The new bridge over the river Blyth, Southwold, was opened on the 1st ult. The bridge has brick abutments and retaining walls, the superstructure being formed of steel trough girders. The parapets over the span are of wrought-iron lattice work; the width across the bridge is 26 ft., and the waterway 20 ft. There are brick piers at each end, the approaches being fenced with cast-iron standards and wrought-iron rails. The plans were prepared by Mr. Henry Miller, the County Surveyor.

**WATERWORKS, BEDWORTH.**—On the 5th inst. the foundation stones were laid of the water tower in connexion with Bedworth waterworks. The works have been entrusted to Mr. Amos Jenkins (Southwell), at a cost of 9,700*l.* Mr. H. B. Nichols (Birmingham) is the engineer to the scheme.

**Kew BRIDGE.**—The Surrey County Council at their quarterly meeting on the 8th inst. considered a report from the joint committee of Surrey and Middlesex similar in terms to that presented to the Middlesex Council on the previous day, stating that after careful reconsideration, the committee were unable to recommend any further reduction in the revised estimate of 149,000*l.* as the contract price for the rebuilding of Kew Bridge, and they repeated their recommendation that an Act should be obtained for fresh borrowing powers. Mr. J. Lawrence moved an amendment to refer the matter back to the committee, but this proposal was rejected, and the recommendations to seal the contract and proceed with the Bill were adopted.

## STAINED GLASS AND DECORATION.

**WINDOW, CHRIST CHURCH, BELPER.**—On the 30th ult. the stained glass window recently erected to the memory of the late Vicar of Christ Church, Belper, the Rev. E. A. Hillyard, was unveiled. The new window, erected by Mr. Kempe, is at the east end of the south wall. The window represents the martyred St. Laurence.

**NEW WINDOW, SUNDERLAND.**—A large stained glass window has just been placed in St. John's Wesleyan Church, Sunderland, containing subjects on the Nativity, the Baptism, Christ as the Good Shepherd, Bearing the Cross, and the Three Maries at the Tomb. Under these are smaller subjects; the whole being surrounded by suitable canopy work. The window is from the studio of Messrs. Powell Brothers, of Leeds.

**DECORATION OF ST. PAUL'S CATHEDRAL.**—Sir William Richmond's scheme of mosaic decoration, St. Paul's Cathedral, was further developed to the public last Saturday, when one of the concave spaces over the lectern was unveiled. It represents Christ reigning from the Tree, the world being represented by a field of wheat ready for the harvest, through which flows the River of Life.

**WINDOW, SCOTFORTH PARISH CHURCH, LANCA-SHIRE.**—At Scotforth Parish Church on the 3rd inst. a stained-glass window to the memory of the late Thomas and Julia Ripley was unveiled and dedicated. The work has been carried out by Messrs. A. Seward & Co. The window, which has been placed at the west end of the church, consists of three lights, the subject chosen typifying Charity.

## FOREIGN.

**FRANCE.**—The scaffoldings are being erected in the Pantheon in preparation for putting up the paintings of Puvis de Chavannes. The public are not to be permitted, however, to see them until the borders, which were left unfinished, have been completed by one of his pupils.—The Municipal Council are discussing a proposition for erecting a monument to the memory of Puvis de Chavannes in the Monceau quarter, where he died; and his name has been given to a street in Paris.

—M. Ferdinand Humbert, painter, has been elected Professor in the Ecole des Beaux-Arts in place of the late M. Lenoir.—M. Rodin, the sculptor, has been commissioned to execute a monument in honour of the poet, Charles Baudelaire. The monument to Chopin, erected by subscription, is shortly to be placed in the Parc Monceau.

It was at first entrusted to M. Froment-Maurice, but has been actually carried out by M. Henri Dubois. —A large fresco measuring eighty superficial metres has just been inaugurated in the Chapelle des Catéchismes at Montmartre. It is executed by MM. Paul Sieffert and Henri Rousseau.

—Barye's sculpture of "Le Lion au Serpent," and Carpeaux's group representing "Ugolin et ses Enfants," are to be removed from the Jardin des Tuileries and placed in the Louvre.—Important works are being undertaken for the restoration of the old and curious church of Villeneuve-Saint-Georges, built in the thirteenth century by the Abbots of Saint Germain des Prés, and partially rebuilt in the Renaissance period.—The tenth annual Fine Art Exhibition at Nantes will open on January 21 next, and close on March 5.—M. Lachenal's exhibition of "peintures, sculptures, céramiques, et grès flamands," has opened in the Georges Petit gallery, and will remain open till November 30.—The death of M. A. Lévêque at the age of seventy is announced. He was keeper of the Municipal Library of Poitiers, and the author of several remarkable archaeological works on Poitou and the two Charentes.—The death is also announced at the age of 48, of M. Marry-de-la-Parayre, an architectural "expert" in Paris.—Only a month after the death of Charles Garnier, his son Christian also died. Only a few days ago the Institute of France awarded the Prix Volney in his honour, for a learned study to which the young man had devoted the closing years of his life.

## MISCELLANEOUS.

**VOLUNTEER MEMORIAL, EXETER.**—At the annual distribution of prizes at the Drill Hall, Bedford Circus, Exeter, of the 1st R.V. on the 2nd inst. a presentation to the building was made. It consisted of a replica of the portrait bust in the Volunteer memorial on Northernhay, in front of the historic Castle of Exeter. It is of terra-cotta, of heroic size. It is the work of Mr. H. Turner Hems, of Exeter.

**WESTMINSTER IMPROVEMENTS.**—At the Surveyors' Institution, Savoy-street, on the 3rd inst. Mr. Arthur Cates, sitting as umpire, had before him a case in which Messrs. Levin, Gregory, & Anderson, Parliamentary agents and solicitors, claimed 4,643*l.* as compensation from the Crown for "disturbance of business" and leaseholds on the premises, Nos. 11 and 13, King-street, Whitehall, which are coming down under the Westminster Sites Improvement Act. Mr. Freeman represented the claimants, and the Solicitor-General, Sir Robert Finlay, appeared for the Crown. In his opening statement Mr. Freeman said that under the Improvements Act the tenants had been given notice to quit, and had acquired premises in Broad Sanctuary. Though the new premises were larger, their situation was by no means so good, in spite of the fact that the rent was 450*l.*—250*l.* more than the rent of the old place. Cost of removal, "disturbance of business," and so on, would, counsel held, bring the amount of compensation to 4,643*l.* Evidence in support of this having been called, the Solicitor-General held that the sum claimed for probable loss of business was absurd in the case of a firm so well known and so long established. The umpire should allow nothing whatever for this, though, of course, something should be allowed for cost of removal and repairs. The umpire reserved his award.

**SPEN VALLEY BUILDERS' ASSOCIATION.**—On the 3rd ult. the fifth annual dinner of The Spen Valley and Heavy Woollen District Contractors' and Builders' Association was held at the Black Bull Hotel, Mirfield. Mr. James Townsley (Vice-chairman of the Hull Master Builders' Association), in proposing the toast of the Association, said if they asked him for a motto he should have to modify the old one, "Do unto others as you would have them do unto you," and substitute "Do unto others as they do unto you," because those forces which were federated were reaping from them the benefits of their united efforts, and it was essential that they should be organised in self-defence. Contractors were often subjected by architects to arbitrary agreements, and this was an evil which could be uprooted by combination alone. Another difficulty they had to contend with was that of the incompetent clerk of works, who watched the contractor's every movement, harassed him with unreasonable requests, and this could only be altered by thorough organisation. Between the proprietor, the architect, and the clerk of works the better word was, "Whom did the contractor work for?" He had three masters, and in combination lay their only redress for the iniquitous wrongs they suffered. Perhaps their ancestors were in some measure responsible for the existence of the clerk of works, and the trade, he contended, should, by avoiding bad workmanship, cultivate the desire for better work, and render the office of "clerk of works" altogether unnecessary. The more they, as contractors, rubbed shoulders together, and the reader they exchanged ideas, the better. Some might contend that each contractor should tender openly, but they were entitled to fair and legitimate remuneration for the work they undertook. He did not think that the contractor was one of the worst enemies. Believing in the principles they believed in, workmen were combined, and were a power to be reckoned with; and he hoped the time would yet come when there would be an affiliation of masters and men—not on the part of the masters, by a peace-at-any-price convention, but, under

proper conditions, affiliations of masters and men would, he believed, result in benefit to both. Mr. W. R. Thompson, President of the Association, responded to the toast.

**PUBLIC IMPROVEMENTS, NEW FERRY.**—On the 2nd inst. at the Public Improvements New Ferry, Colonel W. R. Slacke, R.E., held an inquiry on behalf of the Local Government Board respecting an application by the Lower Bebbington District Council to borrow 10,000*l.* for a sewerage scheme, 5,000*l.* for new public offices, and 3,000*l.* for recreation grounds. Mr. T. Sproat (law clerk) stated that the sewerage scheme was that of taking all the drainage of the district direct to the Mersey, instead of discharging a large portion of it into Bromborough Pool as at present. The scheme selected was that of Messrs. Beloe & Priest, and provided for a population of 28,000. Messrs. Beloe & Priest explained the scheme.

**FIRE STATIONS AND MARKET EXTENSION, LIVERPOOL.**—On the 2nd inst. Colonel C. H. Luard, C.E., held at the Municipal Buildings, Dale-street, Liverpool, an inquiry on behalf of the Local Government Board into applications by the City Council with respect (1) to an increase of fire brigade stations, and (2) to the extension of the North Haymarket. Mr. T. Sproat, in reference to fire stations, said three new stations were still required to make the protection of the extended city from fire. Power was now sought to borrow 12,000*l.* in order to purchase three sites, namely, in Boundary-street, Kirkdale, for the north end and docks, 5,000*l.*; in Grafton-street, Toxteth Park, for the south end of the docks, 4,000*l.*; and in Harper-street, Kensington, adjacent to the Protector-street Police Station, 3,000*l.* for a central area. Mr. T. Sheldermid (City Surveyor) gave evidence as to the value and suitability of the sites.

**COLLAPSE OF A BUILDING, NEWCASTLE-ON-TYNE.**—A beerhouse at Byker Buildings, Newcastle-on-Tyne, which was undergoing alterations, collapsed on the 2nd inst., while the bricklayers and labourers were at work. All the men, however, succeeded in escaping, with the exception of a labourer named Matthew Fitzgerald, who was caught by the falling roof and killed.

**APPOINTMENT.**—Mr. Murdoch Macdonald, C.E., who was Resident Engineer on the Black Isle Railway in Ross-shire, and was recently in charge of doubling the Highway Railway at Blair Atholl, has been appointed Principal Assistant Engineer in charge of the great barrage works on the Nile at Assouan, which are being carried out by Sir Benjamin Baker, as Engineer-in-Chief to the Egyptian Government.—*Scotsman.*

**A NEW USE FOR PRISM GLASS.**—At St. Saviour's, Southwark, an important new application was made of Messrs. Hayward & Eckstein's "Luxur" prism glass, by using it to bring daylight to the exterior of a stained-glass window. This was the window by Mr. Kempe in the north transept, the interior effect of which was destroyed by the shutting out of the light by adjacent buildings; and it appears, on Mr. Kempe's own testimony, that the placing of the prisms outside the window has given it all the effect of a window exposed to full daylight. This may be a useful point to bear in mind in other cases of stained windows in ill-lighted positions.

**PUBLIC IMPROVEMENTS, HULL.**—An inquiry was held at the Hull Town Hall on the 1st inst. as to the application from the Corporation for permission to borrow 120,150*l.* for new streets and improvements, 26,000*l.* for electric lighting, 6,774*l.* for the site of a central Public Library, and 4,103*l.* for a refuse destructor. Mr. R. H. Bucknell, Local Government Inspector, conducted the inquiry. Evidence was given by the City Engineer (Mr. A. E. White) and others.

**ELECTRIC-LIGHT SCHEME, CHELTENHAM.**—An inquiry was held on the 4th inst. by Lieutenant-Colonel A. E. Smith, R.E., Inspector under the Local Government Board, into an application by the Town Council for sanction to a loan of 17,000*l.* for the purposes of electric lighting. The Town Clerk stated that the amount borrowed up to date was 68,152*l.* In consequence of the demand for the light further extensions were necessary, hence the present application. Mr. Hamilton Kilgour, Borough Electrician, gave other particulars, and there being no opposition, the inquiry closed.

**SOCIETY OF ARTS.**—The opening address of the Society's session will be delivered on Wednesday, November 16, by Sir John Wolfe Barry, K.C.B., L.L.D., F.R.S., the Chairman of the Society's Council. The topic which the Chairman proposes to deal with in his address is "The Internal Traffic of London."

**PROFESSOR LEWES ON FIREPROOF BUILDINGS.**—On Tuesday last Professor Vivian B. Lewes delivered a lecture in the London Institution upon "Fire and Fire Extinction," the chair being occupied by Sir Frederick Dixon-Hartland, M.P. The lecture consisted mainly of a popular discourse, well illustrated by experiments upon the chemistry of combustion. Reference was, however, made to one or two matters of practical interest to builders. In modern buildings, said Professor Lewes, there is a tendency to construct the front very largely of glass, and the floors and ceilings of fireproof materials. One of the first results of a conflagration of goods or furniture in buildings of this description was the destruction by heat of the large panes of glass, thus giving the ignited materials a



copious supply of air, converting the rooms into furnaces, and causing huge tongues of flame to burst out of the capacious windows. These flames were often of such dimensions that they licked the face of the buildings on the opposite side of the road, and meeting with more large glass windows, caused them to break, and thus the flames gained contact with the inflammable contents of the buildings. It is sufficient, added Professor Lewes, to obtain sufficient light and air without employing such an extremely large window area; and in a building with less window surface the inrush of air through broken windows would be limited, and the dimensions and fierceness of the flames be proportionately reduced. Professor Lewes advocated the provision of light steel shutters to large windows for use when fire occurred, although he stated that he was quite aware that many people would ridicule the suggestion, and say that it was impracticable, and that the windows were wanted for the escape of inmates thought, however, that the closing the shutters considered a simple method of closing the shutters from the outside could be devised, and that the exclusion of air in this manner would be found in certain cases to be of great value in checking the progress of a fire. Professor Lewes was warmly applauded by the firemen and others present when he deprecated the use of stone staircases, and said that a good oak or teak staircase painted on the surface with some fireproof stucco or paint, was less rapidly destroyed in a fire than a staircase of stone.

**KING'S COLLEGE, PLUMBERS' EXAMINATION.**—An examination of master and operative plumbers for registration under the National Registration of Plumbers was held on Saturday by the Worshipful Company of Plumbers at King's College. Twenty-one candidates presented themselves for examination from various parts of London, also from Cambridge, Carmarthen, Guildford, Maidstone, Ramsgate, Windsor, and Worthing. The tests in workmanship included lead bossing, pipe bending, and joint making, and the examination questions included the subjects of roof covering, contamination of drinking water from faulty connections, arrangement of bath, sink, and closet wastes, drainage of town houses, and disconnection with sewers. The examiners were:—Mr. Charles Hudson, chairman of the board of examiners; Mr. W. H. Webb, plumber; Mr. George Taylor, foreman plumber; and Messrs. W. C. and J. Johnson, operative plumbers. Nine succeeded in passing the examination in practical workmanship.

**QUATUOR CORONATI LODGE OF FREEMASONS.**—On Tuesday last, the 8th inst., Mr. C. Purdon Clarke, C.I.E., Fellow of the Institute of Architects, Director of the Art Museum, South Kensington, was installed as Master of the Quatuor Coronati Lodge, No. 2,076, in succession to Mr. S. T. Klein. Among the new officers for the year are Mr. E. S. Castle, Q.C., Vice-Admiral A. H. Markham, and Rev. J. W. Horsley. The lodge, which takes its name from the legendary saints of the building trades, whose festival occurs on November 8, was established in 1884 for the prosecution of masonic work. Sir Walter Besant was the first Master, and Sir Walter Besant the first (and only) treasurer. There are upwards of 2,700 subscribers to its printed "Transactions." Mr. C. Purdon Clarke is the second architect who has been elected to the chair, the first having been Professor T. Hayter Lewis, who was Master in 1891. The membership of the lodge is restricted to persons who possess either a literary or an artistic qualification.

**WATER PIPES FOR GLASGOW, AND AMERICAN COMPETITION.**—The end of the Glasgow water pipes contract difficulty has not yet arrived. The contract, it will be remembered, was divided between a Philadelphia firm and Messrs. MacLaren, of Glasgow, and on the local firm refusing to accept this division the whole contract was given to the Americans. At a meeting of the Water Committee on the 7th inst. it was reported that pipes were not being received as required, and it was decided to take what was necessary from Messrs. MacLaren, and intimate to the American firm that they would be held responsible for any difference in price paid for pipes while their contract remained unfulfilled.—*Glasgow Evening News.*

## CAPITAL AND LABOUR.

**LEEDS BRICKLAYERS AND THEIR WAGES.**—The Leeds bricklayers have served the masters with a notice which will expire on Monday, hence, demanding 1d. per hour advance of wages (the present rate being 0d. per hour), and also an alteration of the rule regarding apprentices. The labourers are not affected by the demand. The masters have issued a counter notice to reduce the wages 3d. per hour, and also that the rule regarding apprentices shall not be interfered with. As Monday is the last day to expire until the beginning of June next, it is anticipated that the Masters' Federation will take any decisive action for some little time yet.

**BUILDING TRADES OF BOSTON.**—On the 3rd inst. the master bricklayers and builders in Boston received notice from the men demanding an advance from 6d. to 7½d. per hour.

## LEGAL.

### THE COUNTY COUNCIL AND TEMPORARY STRUCTURES.

At the Lambeth Police-court, on the 3rd inst., Mr. G. J. Brown, of the "Walmer Castle," Peckham-road, appeared to answer two summonses taken out by the London County Council, one for setting up a wooden structure without having first obtained a licence from the Council, and the other for retaining the structure.—Mr. T. Chivers, from the solicitors department of the Council, appeared in support of the summonses, and said the defendant was the proprietor of the "Walmer Castle." He proposed to carry out certain alterations to his premises. They were commenced, and he then erected on his forecourt a wooden structure for the purpose of carrying on his business. After it had been set up an application was made to the Council for a licence, but the Council refused to grant one. Notwithstanding that, the structure was kept up.—Mr. Brown, the defendant, said he acted under the advice of his architect in the matter, and had no idea that he was doing wrong. There was now an amended application before the Council for the erection of another shanty during the time the house was being completed.—Mr. Chivers said he must ask for a penalty upon the summonses. The Court had power to make an order for the demolition of the structure, but he would not ask for that upon that occasion.—Mr. Hopkins ordered the defendant to pay a penalty of 20s. upon each of the two summonses, and also directed him to pay one guinea costs.—*Morning Advertiser.*

### WHAT IS A STREET?

On Monday, at the Highgate Police-court, Mr. A. W. Armstrong, of Broadhurst-gardens, West Hampstead, was charged on a summons taken out by the London County Council with having commenced to form and lay out a street for carriage traffic without having first obtained the sanction of the Council. Mr. Horace Avery represented the County Council, and Mr. Cunningham Glen appeared for Mr. Armstrong.

Mr. Avery said that for the purposes of this prosecution the persons laying out a street were deemed to have "commenced" to do so when they began to lay the kerb, &c. Mr. Glen said that he would admit that the formation had been "commenced." Mr. Avery said that the "street" in question had been commenced on the Cleveland estate between the Highgate-road and Parliament Hill Fields. It did not afford any communication with another street on the side furthest from Highgate-road, but was practically a square, with a gate at the private entrance in Highgate-road. The Council had refused to sanction a similar scheme, but Mr. Armstrong was now proceeding without the permission of the Council. The road was 750 ft. in length, and it was proposed to put up twenty blocks of buildings abutting on the street. The estate was 4 acres in extent. Mr. Glen submitted that this was not a "street," but was in the nature of a "court," and would not become a "street" until the entrance gates were removed. The Bench convicted the defendant, and fined him 20s. and 5s. costs. Notice of appeal was given.—*Daily Graphic.*

## MEETINGS.

FRIDAY, NOVEMBER 11.

*Architectural Association.*—Mr. H. Wilson on "Arts and Crafts," 8.30 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Professor Roger Smith on "Sanitary Building Construction," 8 p.m.

SATURDAY, NOVEMBER 12.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection at Richmond Main Drainage Works, Mortlake, 3 p.m.  
*Institution of Junior Engineers.*—Visit to the King William-street Station of the City and South London Railway extension works, 3 p.m.

MONDAY, NOVEMBER 14.

*Surveyors' Institution.*—First Ordinary General Meeting of Session 1898-99. The President, Mr. Robert Vigers, will deliver an Opening Address, 8 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Dr. G. Reid on "Sanitary Appliances," 8 p.m.

TUESDAY, NOVEMBER 15.

*Institution of Civil Engineers.*—Mr. W. Beedie Esson on "Electrical Transmission of Power in Mining," 8 p.m.  
*Northampton Institute, Clarendonwell (Lectures on Architecture).*—Mr. F. Bond on "Perpendicular and Tudor," 8 p.m.

*Sheffield Society of Architects and Surveyors.*—Mr. T. Swaffield Brown (Master of the Arts and Crafts Guild) on "Ecclesiastical and Art Metal Work," 8 p.m.

WEDNESDAY, NOVEMBER 16.

*British Archaeological Association.*—(1) Mr. Alfred C. Fryer, Ph.D., M.A., on "Wool Church, Dorset"; (2) Mr. G. H. Compton on "The Welsh Marches," 8 p.m.  
*Society of Arts.*—Opening meeting of Session. Address by the Chairman of the Council, Sir John Wolfe Barry, 8 p.m.

*Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).*—(1) Inspection in the Parish of St. George's, Hanover-square, 2 p.m.; (2) Mr. J. Wright Clarke on "Details of Plumbers' Work," 8 p.m.  
*Builders' Foremen and Clerks of Works' Institution.*—Ordinary meeting of the members, 8 p.m.

*Northern Architectural Association.*—Inaugural Address by the President, Mr. Frank W. Rich, 7.30 p.m.  
*Edinburgh Architectural Society.*—8 p.m.  
*Liverpool Engineering Society.*—8 p.m.

FRIDAY, NOVEMBER 18.

*Institution of Civil Engineers (Students' Meeting).*—Mr. C. Lightfoot on "The Production of Liquid Air and its Application to Chemical and Other Industries," 8 p.m.

*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. W. C. Tyndale on "House Drainage," 8 p.m.  
*Glasgow and West of Scotland Technical College: Architectural Craftsman's Society.*—Mr. James L. Little on "Conditions which Render Houses Unhealthy," 8 p.m.

*Dundee Institute of Architecture, Science, and Art.*—Dinner, Grand Hall of the Royal Hotel, Union-street, 6 p.m.

SATURDAY, NOVEMBER 19.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection at Harrison & Barker's Knacker Yard, Winthrop-street, Whitechapel, 3 p.m.

## RECENT PATENTS:

### ABSTRACTS OF ACCEPTED SPECIFICATIONS.

#### Open to opposition until December 19.

[1897] 23,932.—**JOINT-MAKING PACKING:** A. S. Morris.—A piece of fabric, coated on its side with a lubricating composition, is rolled up with the composition inside until it takes the shape of a cord or band; the free edge is then temporarily fixed by gold size or any other adhesive substance.

23,965.—**SOLDERING LAMPS:** M. Eulner.—A hollow brass cylinder contains a wick which easily absorbs spirits, the tube is closed at top and bottom; to its lower end is soldered another tube for a handle socket, on the exterior cylindrical side of the large cylinder is soldered a third tube containing a spirit-wick, having its lower end closed and its upper end open; the blowing action is automatically obtained by the escape into the flame of gas through an aperture in the cylinder owing to the heating of the spirit therein by the flame issuing from the third tube.

25,616.—**BALL VALVE FOR CISTERNS, BOILERS, AND OTHER PURPOSES:** W. Errington.—The chamber which carries the ball has an indiarubber seating to form a tight joint between the seat and the ball; the latter is raised by a lever where one end engages upon the ball's under side, and the other end is operated as may be required. The lever may pass through the pipe or tube, in which case the joint may be rendered tight with packing. It is claimed that the contrivance readily affords a supply of water, and that upon release of the lever the supply is at once stopped, owing to the weight of the water above forcing the ball into its seating, the ball's own weight aiding that operation.

27,051.—**COVERS, CAPS, AND LIDS FOR CLOSING THE ENTRANCES OF GAS, SEWER, TELEPHONE, AND ELECTRICAL SUPPLY SHAFTS AND HOLES, GULLIES, &c.:** J. Price & J. Johnson.—To facilitate their lifting for legitimate purposes, and to prevent such lifting under other circumstances, the inventors provide the lids, covers, &c., with an automatically locking device, which consists of a loosely jointed arm or latch attached to the hinged part so as to hang down from its under side when closed, and which has a hook-shaped part or catch, having a curved face, a lifting-piece upon its end, a stop or shoulder, and a lug upon the frame part of the cover, to and upon which the hinged part is jointed and carried. The jointed arm is adapted to engage the stop by its hook-shaped part or catch, and to work upon the shoulder or lug through a lifting-piece or projection, so as to hold the hinged part of the frame at one time and to disengage it and give it an initial lift at another.

27,727.—**BRIDGES OR BRACKETS FOR SUPPORTING LEVERS IN FLUSHING CISTERNS, &c.:** T. & J. H. Cloughlin.—The bridge has lugs or other suitable portions (both ends for attachment to the cistern walls, the lever being pivoted to the bridge) for supporting the lever for operating the discharge mechanism is mounted on a stud carried in bearings situated on the bridge's outside in such a manner that when it is required to remove the lever or other working portions of the apparatus for repair, the stud may be withdrawn from its bearings and the parts released without disturbance of the bridge; the length of the lever's stroke is regulated by stops placed upon the bridge, and set screws may be employed on the stops to adjust the amount of stroke, or the set screws may be placed on the lever instead of on the stops.

29,110.—**IGNITION OF GAS BY ITS OWN ACTION:** H. Schimmel.—Using an igniter of the well-known kind—e.g., that of Duke's patent 669,185—consisting of an igniting body which contains platinum black connected by a simple wire of platinum, the inventor treats the igniting wire with a solution of a salt of platinum or chloride of platinum, in such a way that one or two drops adhere to the wire near the igniting body, the solution adhering to the wire will evaporate and the remaining salt will be reduced to platinum in the form of platinum sponge fixed on the igniting wire or refractory thread: "the inventor takes advantage of the fact that platinum and other substances used for preparing self-igniters grow hot by their own action even in a stream of gas of a very low temperature, when they are in a very finely divided form, named platinum black or platinum mud, whilst platinum of a less finely divided form, named platinum sponge, heats itself only in a stream of warmed gas or when the platinum sponge is warmed itself."

28,609.—**WINDOW SASHES:** E. Duval.—These (a) comprise outer casing having inner pivots projecting from their sides, double-grooved pulleys to revolve on the pivots, an upper and lower sash with inner recessed edges passing the pulleys, with side stops and guides for the sashes; (b) consist of outer and inner casings, having projecting pivotal centres, with grooved pulleys therein; and (c) consist of adjustable and swinging sashes, having vertically recessed side edges for movement over grooved pulleys pivoted to the inner side of an outer frame or casing, an inner side casing between the pulleys and the side of the outer frame, with cables attached to the ends of the sashes.

29,020.—**CONSTRUCTION OF BRICKS AND OTHER MOULDED BUILDING MATERIALS:** F. S. Smith.—Each brick is tongued or grooved so that its cross section fits into the cross section of the brick above it, its top side is tongued or has a projection, the tongue of the underneath brick fitting into the groove of the upper brick.

29,063.—**FIRE-BRICKS, SLABS, OR TILES:** C. Hannay, director of the Caribbee Manufacturing Co.—These are



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premises.	Designs to be delivered.
*Public Library	Hull Corp.	507, 307, 201.	Jan. 1, 99
*Fire Brigade Station	Bradford Corp.	106/7, 604, and 307.	Jan. 2

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Fish Market and Offices, The Hayes.	Cardiff Corp.	W. Harper, C.E. Town Hall, Cardiff.	Nov. 15
Stabling, &c., Gordon street Dye Works, Bradford.	Margatroyd & Lister.	J. Robertshaw & Son, Archt. 55, Tyndal-street, Bradford.	do.
*Surface Water Drainage	Bradley U.D.C.	Barrow, Council Offices, Bradford.	do.
*Kerbing, Tar Paving, &c.	Lewisham Board of Works.	Sur. Dept. Board's Offices, Clifton, S.E.	do.
House, Bely, York.	N. & B. Co.	W. Bruce & Son, N.E. Station, York.	Nov. 16
Boundary Walls, &c.	Borlough (Lancs.) Parish Council.	William & Son, Owen, Archt. Warrington.	do.
Alterations at Victoria Rooms	Bedlington U.D.C.	C. Gray, Council's Offices, 3 Aldington.	do.
Factory, Foyle-road, Londonderry.		D. Conroy, Archt. 2, Bishop-street, Derry.	do.
Painting, &c., Holbrook (Suffolk) School.	Bucklow Union.	E. F. Bishop, Archt. 32, Museum-street, Ipswich.	do.
Hospital, Knutsford.		R. J. & B. Smith, Archt. Ruman House, Sale.	do.
Painting, &c., Offices.	Cardiff Corp.	W. Bruce & Son, N.E. Station, Cardiff.	do.
Villa, Bathan Hall-road, Longwood, near Bradford.		J. Berry, Archt. 2, Queen-street, Bradford.	do.
*Making up and Paving Road	Fulham Vestry.	C. Botterill, Town Hall, Fulham.	do.
*Fever Hospital at Workhouse	Bucklow Union.	R. J. & B. Smith, Brixton House, Sale.	do.
Additions to Schools	Monk Bretton Sch. Bd.	W. Ostry, Archt. 10, Pitt-st. Bursley.	Nov. 17
Four Houses, Fairfield-road, Morecambe.		J. Eardley, Archt. 10, Pitt-st. Bursley.	do.
Additions to Warehouse, Strathmilli Distillery, Kith.		C. C. Dolg, Archt. Elgin.	do.
Caveston, &c., Market-place.	Ripon Corp.	City Surv. Town Hall, Ripon.	do.
Additions to Schools, Barnard.		Arch. St. Grainger-st. West, Newcastle-on-Tyne.	Nov. 18
Block of Buildings, Lowleywood.	Lady Gordon Cumming.	A. & W. Reid & Willet, Archt. Elgin.	do.
Public Hall, Pittlebury, N.B.		J. Bruce & Son, Archt. Dundee.	do.
Cottages, Portland-road, Kingston upon Thames.		V. Davidson, C.E. New Malden.	Nov. 19
Hospital, Leicester Marsh Estate.	Lancaster Corp.	Borough Surv. Town Hall, Lancaster.	do.
Chapel, Armiter Lewis.		Branch-road, Batley.	do.
*Wood Blocks	Camberwell Vestry.	W. Ostry, Archt. 10, Pitt-st. Bursley.	Nov. 21

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
*Concrete Sea Wall and Esplanade	Boguer U.D.C.	O. A. Bridges, High-st. Boguer.	Nov. 21
School Additions	Hastings U.D. Sch. Bd.	A. Wells, Archt. Queen's Chambers, Hastings.	do.
Hotel, Rother, Eglon, N.B.		G. Sutherland, Archt. Eglon.	Nov. 22
*Alteration of Drainage at Schools, Metcham.	Wethers Union.	A. Baxton & Son, 22 South-lampoon-hill, W.C.	Nov. 21
*Enlargement of School	Bushy S.B.	W. H. Syme, 1, High-st. Clerk, Town Hall, Old.	do.
*Temporary Floorings at Swimming Baths	Shoreditch Vestry.	street, E.C. 4.	Nov. 23
*Vagrant Waives at Workhouse	Hartford Union.	street, Hartford.	Nov. 26
Workhouse Additions	Culfer, Ireland Union.	J. Parry, County Sur. Galway.	Nov. 28
*Road and Sewer, Tottenham		Tuck-It & Son, 2, Basing-street, E.C. 4.	do.
*Brick and Concrete Sewer, &c.	Lewisham B. of W.	The Surveyor, Town Hall.	Nov. 29
House, &c., Baldon		Edw. Adkin & Hill, Archt. Presidential buildings, Bradford.	Nov. 30
School, Rhylfaw, Glam.	Lianguicke Sch. Bd.	W. W. Williams, Archt. 63, Wind-street, Swansea.	do.
*Additions and Alterations (consolidation) to School Premises	Govera James Allen.	Oliver Scholes, Dulwich Admiralty.	Dec. 1
*Coastguard Buildings at Hastings		land-avenue, W.C.	Dec. 2
*School Buildings	West Hartlepool S.B.	Oliver Park-road, West Hartlepool.	do.
Public Conveniences, &c., Clarkson-st.	Sheffield Corp.	C. F. Wike, C.E. Town Hall.	Dec. 3
Business Premises	Lenton & Nottingham Co-operative Soc.	Ball & Lamb, Archt. 25, Kings-st. Nottingham.	No date
Nine Houses, Avenue, Lenton, Albion.	G. Reid	J. Miles, Archt. Eglon.	do.
Cottages, Moray-street		Allen-road, Alerton.	do.
Villa, Real tenor, Pool, York.	J. W. Foster.	W. A. Hubson, Archt. 32, York-st. Leeds.	do.
Two Shops, Romsey Park, Sale.		S. Smith, Archt. Sale.	do.
Five Houses, Beaumont-st., Cardiff.		Conner-road, Cardiff.	do.
*Pulling Down and Removing Church	Midland Central Estates	Essex, Nichol & Goodman, Newcastle-st., Birmingham.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in.
*Manager for Sewage Farm	Longton Corp.	1500. per annum and residence.	Nov. 19
*Clerk of Works	County Board of Sunderland.	3. 10s. per week.	Nov. 21
*Clerk of Works	London County Council.	5. 5s. per week.	Nov. 22
*Architectural Assistant	Walthamstow U.D.C.	10s. per week.	Nov. 23
	Poplar B. of W.	36. 3s. per week.	No date

Those marked with an asterisk (\*) are advertised in this Number. Competitions, pp. iv. Contracts, pp. vi. viii. & xix. Public Appointments, pp. xvii. & xix.

made from a mineral diatomaceous earth such as is found in the Island of Barbados. The inventors say they find from experiments that this earth is very applicable for the particular purpose, its chemical analysis being as follows: Silica, 82.20; alumina, 5.25; iron peroxide, 1.75; lime, 2.30; and volatile and organic matter, 9.57. In using the earth they prefer to mix a certain proportion of fire-clay, or asbestos, with it, say from 1 to 25 per cent, or may mix paper or other pulp, if a light brick is required, so that when the brick is fired the pulp is burned out leaving a porous and very light brick.

30,397.—COVERINGS FOR WALLS AND CEILINGS: *H. F. Taylor*.—To provide a cheap substitute for wooden panels, &c., is used a sheet of plastic material, such as paper pulp, with or without binding substance and colouring matter, the grain of wood is imitated thereon by passing the sheet between embossing rollers, or pressing it between moulds, which are engraved so as to produce on the plastic sheet an imitation of wood fibre or grain in relief.

15,981.—234. —WATER WASTE PREVENTERS: *T. Cange, jun.*—To effect a noiseless discharge and to dispense with valves, is provided, beneath the inlet, a curved, fan-shaped spreader, which dips towards the bottom of the tank, in order to prevent noise by the inflow of water; in or about the centre of the bottom of the tank is placed a cube, having a sealed cover at its top and a flanged open base; before the cover is soldered to the tube is inserted a trumpet-shaped flanged tube, screwed at one end with a male thread, to form the syphon; to an eyelet on the cover's top is connected the end of a pull-down lever, pivoted between two jaws or lugs fixed at the top of the tank.

2,579.—IMPROVEMENTS IN TENEMENT BUILDINGS: *A. Turner*.—The claim is for the construction of tenement houses, which shall be better ventilated and more sanitary than those at present existing; the claims comprise an arrangement for making an area common to two houses together, the "cubicles" being ranged around the area. The scheme (devised by an architect living at Hong Kong) will be best understood by inspection of the plans attached to the specification.

14,635.—COMPUTING SCALES: *M. Levy*.—The tool or device is intended to serve for determining the square superficial areas of boards, floors, or other surfaces, the determination being effected—without recourse to calculation—by the displacement of a slide which is adjusted according to the width of the board, &c. The slide, containing the lengthwise measures, is adjusted to the width of the board so that the tool's stop-edge and the slide each embrace one edge of the board, in which action the slide adjusts itself opposite one of the numerical figures of the rows arranged upon the sides of the tape or rule-shaped tool, of which figures the one adjacent to the lengthwise number on the slide indicates the area required.

25,603.—TIE-MAKING AND PUNCHING TABLES: *C. Kempshall*.—The table has an open top across which are transverse rollers, over which the clay is passed in slab-like form, and has a hinged frame at its one end so attached

that it can be brought down on to the clay for the punching of holes therein, the slab of clay being divided by wires at one end of the table, and also on a frame, which latter can be moved so as to cause the wires to pass from one end to the other of the table. This table is intended to make four tiles at a time, but the invention could be adapted for making more or less at a time.

17,731.—TAPS FOR STREAM, WATER, GAS, AND OTHER LIQUIDS OR FLUIDS: *J. B. Butlerfield*.—The novelty lies in reversing the position of the plug—that is to say, the cone has its larger end downwards; the plug is forced upwards against the valve-seating by a spring, spiral or otherwise, or by an adjustable screw; besides reversal of the plug, a shoulder is formed on the plug-spindle to fit against a corresponding surface in the valve-box; thus the valve cannot become jammed or unduly tight, whilst, as is claimed, the escape of liquids or fluids or gases is entirely prevented.

17,799.—VENTILATORS FOR ROOMS, BUILDINGS, &c.: *J. Carr*.—The ventilator's lid has two sides, a curved back, and a top; the lid is pivoted between the sides of the box, or case, by pins secured to its back; a stud fixed to a side of the lid projects through a curved slit in a side of the case; a cord passing over a pulley on a stud fixed outside the case has one end connected to the stud on the side of the lid and its other end hangs down, so that by pulling the string the lid can be moved in position; an air diffuser is also attached to the contrivance, being preferably pivoted between the sides of the case with a cord and pulley for its adjustment.

## NEW APPLICATIONS.

October 21-29.

6,991A, E. Weston, Index Needles or Pointers for Electrical and other Indicating or Measuring Instruments. 22,296, W. Menzies, Seats of Closets. 22,302, Dobbies, Waste or Slop Water-closets. 22,310, Frances, Grates for Domestic Fireplaces. 22,315, C. E. Kelway, Electrical Time Indicator. 22,319, R. Y. Foley, Building Tiles. 22,329, J. M. Matthews, Locks and Fastenings for Doors, &c. 22,327, H. Stanton, Fire Resisting Floors. 22,344, Delavan & Breret, 22,601, H. C. Spinney, and 22,805, T. J. Thoma, Arc Lamps. 22,347, A. W. Miller, Construction of Walls, Arches, or Floors, Applicable for Grain Storage Bins, &c. 22,354, W. R. Gorell, Rope Clamp. 22,369, B. Reynard, Washing and Cleaning Windows. 22,370, J. C. W. Keatens, Protection of French and similar Windows. 22,405, S. H. Thurston, Coating Iron and other Metals with Copper. 22,412, R. B. Adams, Gas Stoves. 22,415, E. Liebscher, Spraying De-

vices for Liquids, Paints, &c. 22,430, H. C. Schmidt, Compression Cocks. 22,442, Keiths, Coal Saving Fire Grate. 22,464, P. Pichard, Lathes. 22,475, T. Longmore and 22,476, R. B. C. Douglas, Circular Saw Guards. 22,480, J. Nash, Oil Stone Case. 22,481, J. Nash, Oil Stone Case. 22,482, W. H. Johnson, Metallic Lathing. 22,495, T. F. J. Truss, Raising Water from Mines and other Places. 22,499, W. Williamson, Destruction of all Insects in Greenhouses or other Horticultural structures, &c., and also in open air. 22,515, Katie M. Moran, Road, Street, and Footpath Cleaning. 22,515, C. M. F. Andersen, Locks. 22,523, M. H. Smith, Conduits for Electrical Tramways. 22,529, J. Nash, Oil Stone Case. 22,531, F. J. Truss, Street Sweeping. 22,537, G. Markt, Electrical Push Buttons. 22,539, Schneeweiss & Rösching, Sand-Blast Machines for Cleaning Castings, &c. 22,543, T. Colles, Sash-Window Pulleys. 22,547, S. Harrison, Automatic Replacement of Fuses in Electrical Light and Power Installations. 22,559 and 22,644, T. W. Twyford, Joints or Couplings of Sanitary and other Pipes, and Traps and Bends of Sanitary Appliances. 22,566, G. Bowman, Files. 22,568, Thompson & McEwen, Syphon Cisterns and Water-Waste Preventers. 22,569, E. N. W. Hume, "Self-replacing Indicator for Bells, Telephones, &c." 22,571, W. Oliver, Overen Doors. 22,580, H. W. C. Cox, Fire Extinguisher. 22,583, Sharp & Brothers, to Enable Pipes to Resist Bursting or Straining from Frost or Sudden Shocks. 22,584, F. O'Brien, Telephone Index. 22,591, Farrer & Co., Stopping or Closing Devices for Pipes or Conduits. 22,596, J. Wright, Nozzle for the Protection of Firemen Fighting Fire. 22,599, C. D. Haskins, Electrical Meters. 22,603, Long & Schattner, Pre-payment Electricity Meters. 22,618, A. C. V. Davies, Securing Screw Caps, Nuts, Plugs, &c. 22,626, J. L. Wiles, 22,707, Buck & Torrey, and 22,717, F. Strickland, Gas, Oil, and other Internal Appliances. 22,721, H. McGrouther and others, Fireproof Doors, Shutters, or similar Structures. 22,628, E. Spitz, and 22,640, J. W. Hunter, Gas and Oil Engines. 22,639, S. R. Baldon, Punkahs. 22,635, W. H. Kilbourn, Track-sanding Apparatus. 22,641, Moorwoods, Roofing. 22,647, J. Ward, Earthenware Pipes and Copings and Pipe-jointing. 22,650, J. Lee, Flush Supply C. P. Kinneil, Fittings for Gas-works. 22,659, T. W. Thornton, Gauges for Saw Fences. 22,665, J. Horne, Map Case, to show two sections at once. 22,672, Nodder & Rogers, Window-sash Fastener. 22,678, Godwin & Pickering, Wall Ornamental Ironwork. 22,678, Walker & Co., Saw Guard. 22,774, R. W. McDonald, Down-pipes of Flushing Cistern, Lavatories. 22,780, F. Fieldier, Floor Paper-hanging. 22,784, J. B. Lafond, Water Gas. 22,790,



F. J. J. Gibbons, Locks and Keys, 27, 29, J. Kershaw, Wood-working Machinery, 28, 29, 31, L. J. Steele and Co., Incandescent Electrical and other Lamps, 28, 29, 31, T. A. Branch, Air-line Ventilators for Drains, Sewers, &c., 28, 29, 31, T. Smart, Safety Breaks for Cranes, Winches, &c., 28, 29, 31.

## SOME RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

October 22.—By CUNNAN & ROBERTS (At Chester).  
Chorlton, Cheshire.—The Mount Farm, 118 a. 3 r. 9 p. f. £6,100  
Strawberry Farm, 38 a. f. 2,000  
Padeswood, Flint.—Bistre Farm, 80 a. 6 r. 20 p. f. 2,400  
Blaise, Flint.—A plot of building land, 2 a. 3 r. 0 p. f. 285  
October 25.—By J. STRAKER & SON (At Abergeenny).  
Penrose, Mon.—Penrose Farm, 307 a. 0 r. 28 p. f. 5,724  
October 26.—By H. DUKES & SON (At Moreton).  
Overmerton, Dorset.—A freehold estate, comprising 215 a. 3 r. 10 p. f. 3,500  
October 27.—By W. WILSON & SON (At Sandbach).  
Ickton, Cheshire.—Gravel Bank Farm, 12 a. 1 r. 2 p. f. 1,240  
October 28.—By G. B. HILLIARD & SON.  
Sandon, Essex.—Southlands Farm, 367 a. 1 r. 1 p. f. 3,825  
Southminster, Essex.—Halkin, a plot of building land, 12 a. f. 500  
October 29.—By BRIANT & SON.  
Bermodeson, 99, 94, 95, and 98, Camilla-rd., ut. 397 yds., g. 100.  
October 30.—By HAMILTON & MALL.  
West Brompton.—11, Redcliffe Mews, ut. 657 yds., g. 64.  
October 31.—By KNIGHT, FRANK & RUTLAND.  
Hampstead.—10, Stanley Gardens, ut. 647 yds., g. 124, r. 66.  
Clapham.—82, 84, and 86, Park-pl., f. 1, 2, and 7, Thornbury-ter., ut. 83 yds., g. 154, r. 26.  
Old Kent-rd.—8, 9, and 10, Bowles-rd., ut. 44 and 37 yds., g. 147, 58.  
Merton.—9, and 11, Willow View, ut. 83 yds., g. 107, 108.  
October 31.—By W. M. WESTON.  
Bayswater.—243, 245, and 247, Westbourne-grove, and 1A and 2A, Denbigh-rd., ut. 44 yds., g. 284, r. 305.  
October 31.—By FAREBROTHER, ELLIS & CO.  
Coldash, Berks.—Sunnyside, and 8 a. 1 r. 5 p. f. Ball's Pond.—Ball's Pond-rd., f. g. 1 r. 5 p. f. 2,003  
Ball's Pond-rd., a peppercorn g. r. reversion in 5 yrs.  
Ball's Pond-rd., a peppercorn g. r. reversion in 5 yrs.  
Dalston.—90, Dalston-lane, ut. 51 yds., g. 61, 108, r. 38.  
Hackney.—44 and 56, Downs Park-rd., ut. 64 yds., g. 74, r. 50.  
Regent's Park.—124, Albany-st., ut. 25 yds., g. 80, r. 11, 51, r. 72.  
St. Lawrence, Kent.—A freehold house and 1 a. 0 r. 0 p. f. 184.  
St. John's Hill, ut. 604 yds., g. 107, r. 66.  
October 31.—By C. C. & T. MOORE.  
Limehouse.—Gun-lane, "The Duke of Cornwall" 1 a. 0 r. 0 p. f. 351.  
Upton Park.—3, 4, 5, and 6, 70 yds., g. 101, r. 42.  
Canning Town.—23 and 23, Victoria Dock-road, Battersea.—6 to 10 (even), Henley-st., ut. 61 yds., g. 151.  
33 and 35, Henley-st., ut. 604 yds., g. 54, 108.  
Mile End.—25, 26, and 28, Moody-st., f. 1 r. 145, 158.  
Poplar.—100, Bath-st., f. 33, 165.  
October 31.—By STIMSON & SONS.  
Clapham.—60 and 71, Suggden-rd., ut. 87 yds., g. 141.  
121, Grandison-rd., ut. 85 yds., g. 61, 108.  
Hackney.—27 to 35 (odd), Brunswick-st., ut. 46, 49, and 50 yds., g. 22, 108 (in lots).  
Barking.—23, 25, and 27, Cambridge-rd., ut. 84 yds., g. 124, 125.  
Kent-rd.—1 and 3, Poplar-rd., ut. 47 yds., g. 122, 125.  
Canterbury.—8 and 10, Jardin-st., ut. 72 yds., g. 144, 50.  
Brixton.—40 and 50, Cornwall-rd., ut. 72 yds., g. 51, 85, 60, r. 40.  
Honour Oak.—8, Canonbie-rd., ut. 978 yds., g. 147.  
Dulwich.—178, Upland-rd., ut. 95 yds., g. 7, 108, r. 38.  
October 31.—By J. BLECKLEY SMITH.  
Bedford-row.—20, Mill-lane, ut. 81 yds., g. 401.  
Hampstead-rd.—59, Robert-st., ut. 25 yds., g. 21.  
Sylvan-rd.—7 and 9, Ewing-rd., ut. 75 yds., g. 154, 158.  
Bromley-by-Bow.—20 to 20 (even), Edglingord, ut. 63 yds., g. 302, 108.  
Stratford.—16 to 32 (even), Northam-st., ut. 71 yds., g. 274.  
Sylvan-rd.—49, 51, 53, and 55, ut. 476 yds., g. 491.  
Forest Gate.—1 to 25 (odd), Sylvan-rd., ut. 678 yds., g. 394.  
Sylvan-rd.—94, 158, ut. 678 yds., g. 178.  
Woodford Green.—1 to 2, Elm-cottages, ut. 70 yds., g. 394.  
2, 3, and 3, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Chingford-lane, two freehold houses, r. 302, 108. Chingford-lane, fifteen plots of building land, f. Elm-grove, eight plots of building land, f. Chingford-lane, f. g. 154, reversion in 90 yrs. Lime-ter., f. g. 204, 108, reversion in 90 yrs. Leytonstone.—Harrow Green, a freehold stable, 44.  
Forest Gate.—Round-rd., f. g. 154, 100, reversion in 84 yds. (in lots).  
Brentwood, Essex.—Brook-st., five freehold cottages, f. 251.  
Sutton Valence, Kent.—Town Well House and a cottage, f. 1.  
South-lane, a freehold fruit plantation. 938  
Salehurst, &c., Sussex.—The Salehurst Park Estate, 637 a. 1 r. 6 p. f. 8,300  
Salehurst, Sussex.—Five freehold cottages and a o. r. 39 p. f. 285  
By EDWIN EVANS (At Streatham).  
Streatham.—Mitcham-lane, &c., 225 plots of building land, f. (in lots). 22,294  
October 28.—By HURLEY & SON (At Exeter).  
Tiverton, Devon.—Palfreys Barton, Ewings, and Knackers' Hole Estates, 355 a. 1 r. 16 p. f. 5,000  
By DEBENHAM, STORR, & SONS (At Margate).  
Margate, Kent.—151, 17, 19, and 21, Ethelbert-rd., f. r. 2001.  
By BARR & BARR.  
Hornsey.—Church-lane, Durye Dene, Lyndhurst, and Clapham, ut. 928 yds., g. 244, r. 1667.  
Crouch End.—13, Rosebery Gardens, ut. 908 yds., g. 94, r. 604.  
By JOHN DAVIES.  
Walthamstow, Wignall-rd., Clarendon Cottage, f. 1.  
40 to 50 (even), Lennox-rd., f. 1554. 320  
By HAMILTON & SONS.  
Bloomsbury.—Hunters-st., &c., 258, 132, 39, ut. 78 yds., g. 504, and 258 extra for last half-year. 3,545  
By BAKER & SONS.  
City of London.—London, Wal. Finsbury-circus, &c., area 49,000, a building lease for 80 yrs. at per annum. 17,000  
By MESSRS. MELLERSH.  
Bethnal Green.—Oak-st., "The Rose" p-h, f. 1, 401.  
66, Vallance-rd., f. r. 241. 1,800  
Clapton.—156, 158, and 160, Glenarm-rd., ut. 75 yds., g. 154. 485  
By R. W. SCORRELL.  
Dalston.—46, Broke-rd., ut. 47 yds., g. 41, r. 301.  
Clapton.—142, Clapton High-rd., 1,395  
Hackney.—25, Sutton-pl., ut. 30 yds., g. 214, 108.  
Sutton-pl., plot of building land, f. 450  
St. John's Wood.—4, Fairfax-mews, ut. 46 yds., g. nil, r. 254. 240  
By TOWERS, ELLIS, & CO.  
Hyde Pk.—7, Leicester-st., ut. 298 yds., g. 1, 41. 325  
64, Porchester-mews, ut. 40 yds., g. 1, 41. 505  
Bayswater.—10, Sunderland-ter., ut. 504 yds., g. 1, 41.  
October 31.—By JACKSON, SON, & WEALL.  
Hendon.—Lawrence-st., &c., a corner plot of land, f. 300  
Hartington, Middx.—Enclosure of building land, 23 a. 0 r. 37 p. f. 3,300  
Victoria-lane, Church Field, 7 a. 2 r. 11 p. f. 1,000  
New-rd., a piece of land, 1 a. 2 r. 30 p. f. 200  
Contractions used in these lists.—F. g. for freehold ground-rent; g. r. for leasehold ground-rent; f. g. r. for freehold; c. for copyhold; l. for leasehold; e. r. for estimated rent; ut. for unexpired term; p. a. for per annum; yds. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

## PRICES CURRENT OF MATERIALS.

**TIMBER.**  
Greenheart, B.C. 8/10 0/10  
Teak, E.I., 10/10 0/10  
Siquela, U.S. 10/10 0/10  
Ash, Canada, 3/10 0/10  
Birch, do., 2/10 0/10  
Elm, do., 1/10 0/10  
Fir, Danish, 2/10 0/10  
Oak, do., 2/10 0/10  
Pine, Canada, 2/10 0/10  
Do, yellow, 2/10 0/10  
Lath, Danish, 4/10 0/10  
St. Petersburg, 4/10 0/10  
Waincoat, 4/10 0/10  
Oak, loc., 4/10 0/10  
Oleada, crown, 4/10 0/10  
Dada, 4/10 0/10  
and 2nd std, 4/10 0/10  
Do, 3rd std, 4/10 0/10  
Do, 4th std, 4/10 0/10  
Do, 5th std, 4/10 0/10  
Do, 6th std, 4/10 0/10  
Do, 7th std, 4/10 0/10  
Do, 8th std, 4/10 0/10  
Do, 9th std, 4/10 0/10  
Do, 10th std, 4/10 0/10  
Do, 11th std, 4/10 0/10  
Do, 12th std, 4/10 0/10  
Do, 13th std, 4/10 0/10  
Do, 14th std, 4/10 0/10  
Do, 15th std, 4/10 0/10  
Do, 16th std, 4/10 0/10  
Do, 17th std, 4/10 0/10  
Do, 18th std, 4/10 0/10  
Do, 19th std, 4/10 0/10  
Do, 20th std, 4/10 0/10  
Do, 21st std, 4/10 0/10  
Do, 22nd std, 4/10 0/10  
Do, 23rd std, 4/10 0/10  
Do, 24th std, 4/10 0/10  
Do, 25th std, 4/10 0/10  
Do, 26th std, 4/10 0/10  
Do, 27th std, 4/10 0/10  
Do, 28th std, 4/10 0/10  
Do, 29th std, 4/10 0/10  
Do, 30th std, 4/10 0/10  
Do, 31st std, 4/10 0/10  
Do, 32nd std, 4/10 0/10  
Do, 33rd std, 4/10 0/10  
Do, 34th std, 4/10 0/10  
Do, 35th std, 4/10 0/10  
Do, 36th std, 4/10 0/10  
Do, 37th std, 4/10 0/10  
Do, 38th std, 4/10 0/10  
Do, 39th std, 4/10 0/10  
Do, 40th std, 4/10 0/10  
Do, 41st std, 4/10 0/10  
Do, 42nd std, 4/10 0/10  
Do, 43rd std, 4/10 0/10  
Do, 44th std, 4/10 0/10  
Do, 45th std, 4/10 0/10  
Do, 46th std, 4/10 0/10  
Do, 47th std, 4/10 0/10  
Do, 48th std, 4/10 0/10  
Do, 49th std, 4/10 0/10  
Do, 50th std, 4/10 0/10  
Do, 51st std, 4/10 0/10  
Do, 52nd std, 4/10 0/10  
Do, 53rd std, 4/10 0/10  
Do, 54th std, 4/10 0/10  
Do, 55th std, 4/10 0/10  
Do, 56th std, 4/10 0/10  
Do, 57th std, 4/10 0/10  
Do, 58th std, 4/10 0/10  
Do, 59th std, 4/10 0/10  
Do, 60th std, 4/10 0/10  
Do, 61st std, 4/10 0/10  
Do, 62nd std, 4/10 0/10  
Do, 63rd std, 4/10 0/10  
Do, 64th std, 4/10 0/10  
Do, 65th std, 4/10 0/10  
Do, 66th std, 4/10 0/10  
Do, 67th std, 4/10 0/10  
Do, 68th std, 4/10 0/10  
Do, 69th std, 4/10 0/10  
Do, 70th std, 4/10 0/10  
Do, 71st std, 4/10 0/10  
Do, 72nd std, 4/10 0/10  
Do, 73rd std, 4/10 0/10  
Do, 74th std, 4/10 0/10  
Do, 75th std, 4/10 0/10  
Do, 76th std, 4/10 0/10  
Do, 77th std, 4/10 0/10  
Do, 78th std, 4/10 0/10  
Do, 79th std, 4/10 0/10  
Do, 80th std, 4/10 0/10  
Do, 81st std, 4/10 0/10  
Do, 82nd std, 4/10 0/10  
Do, 83rd std, 4/10 0/10  
Do, 84th std, 4/10 0/10  
Do, 85th std, 4/10 0/10  
Do, 86th std, 4/10 0/10  
Do, 87th std, 4/10 0/10  
Do, 88th std, 4/10 0/10  
Do, 89th std, 4/10 0/10  
Do, 90th std, 4/10 0/10  
Do, 91st std, 4/10 0/10  
Do, 92nd std, 4/10 0/10  
Do, 93rd std, 4/10 0/10  
Do, 94th std, 4/10 0/10  
Do, 95th std, 4/10 0/10  
Do, 96th std, 4/10 0/10  
Do, 97th std, 4/10 0/10  
Do, 98th std, 4/10 0/10  
Do, 99th std, 4/10 0/10  
Do, 100th std, 4/10 0/10  
Do, 101st std, 4/10 0/10  
Do, 102nd std, 4/10 0/10  
Do, 103rd std, 4/10 0/10  
Do, 104th std, 4/10 0/10  
Do, 105th std, 4/10 0/10  
Do, 106th std, 4/10 0/10  
Do, 107th std, 4/10 0/10  
Do, 108th std, 4/10 0/10  
Do, 109th std, 4/10 0/10  
Do, 110th std, 4/10 0/10  
Do, 111th std, 4/10 0/10  
Do, 112th std, 4/10 0/10  
Do, 113th std, 4/10 0/10  
Do, 114th std, 4/10 0/10  
Do, 115th std, 4/10 0/10  
Do, 116th std, 4/10 0/10  
Do, 117th std, 4/10 0/10  
Do, 118th std, 4/10 0/10  
Do, 119th std, 4/10 0/10  
Do, 120th std, 4/10 0/10  
Do, 121st std, 4/10 0/10  
Do, 122nd std, 4/10 0/10  
Do, 123rd std, 4/10 0/10  
Do, 124th std, 4/10 0/10  
Do, 125th std, 4/10 0/10  
Do, 126th std, 4/10 0/10  
Do, 127th std, 4/10 0/10  
Do, 128th std, 4/10 0/10  
Do, 129th std, 4/10 0/10  
Do, 130th std, 4/10 0/10  
Do, 131st std, 4/10 0/10  
Do, 132nd std, 4/10 0/10  
Do, 133rd std, 4/10 0/10  
Do, 134th std, 4/10 0/10  
Do, 135th std, 4/10 0/10  
Do, 136th std, 4/10 0/10  
Do, 137th std, 4/10 0/10  
Do, 138th std, 4/10 0/10  
Do, 139th std, 4/10 0/10  
Do, 140th std, 4/10 0/10  
Do, 141st std, 4/10 0/10  
Do, 142nd std, 4/10 0/10  
Do, 143rd std, 4/10 0/10  
Do, 144th std, 4/10 0/10  
Do, 145th std, 4/10 0/10  
Do, 146th std, 4/10 0/10  
Do, 147th std, 4/10 0/10  
Do, 148th std, 4/10 0/10  
Do, 149th std, 4/10 0/10  
Do, 150th std, 4/10 0/10  
Do, 151st std, 4/10 0/10  
Do, 152nd std, 4/10 0/10  
Do, 153rd std, 4/10 0/10  
Do, 154th std, 4/10 0/10  
Do, 155th std, 4/10 0/10  
Do, 156th std, 4/10 0/10  
Do, 157th std, 4/10 0/10  
Do, 158th std, 4/10 0/10  
Do, 159th std, 4/10 0/10  
Do, 160th std, 4/10 0/10  
Do, 161st std, 4/10 0/10  
Do, 162nd std, 4/10 0/10  
Do, 163rd std, 4/10 0/10  
Do, 164th std, 4/10 0/10  
Do, 165th std, 4/10



LONDON.—For new system of drains and sanitary appliances at 47, Pall Mall, S.W., for Messrs. Bell, Rennie, & Co. Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W.  
Houghton & Co. .... £275 W. S. Beaton\* ..... £145  
B. Fitch & Co. .... 150 Accepted.

LONDON.—Accepted for the erection of ten villas in Lordship-lane, Tottenham, for Mr. E. Chick. Mr. H. Mitchell, surveyor, 55, Moorgate-street, E.C. 1.—  
W. Hawley, Tottenham ..... £3 600

LONDON.—For alterations to Nos. 6 and 7, Addie-street, E.C. Mr. Charles Watkins, architect.—  
Heape ..... £1,674 Mason ..... £1,508  
Abraham ..... 1,597

LONDON.—For alterations, decorations, &c., at 168, Clerkenwell-road, E.C. 1.—  
Moepf ..... £313 Little & Senecal ..... £373  
Hawley ..... 310

LONDON.—For new billiard-room, &c., to "The Grosvenor Arms," Sidney-road, Stockwell, for Mr. C. R. Park, Mr. A. J. Periam, architect, 43, Cannon-street, E.C. 4.—  
Ardill & Co. .... £1,895 Gould & Brand ..... £1,665  
Maxwell Bros. .... 1,250 Edwards & Medway ..... 1,262  
Rhodes ..... 1,689 Bragg & Sons (accepted) ..... 1,544

LONDON.—For basement walls of Cranston's Waverley Temperance Hotel, Southampton-row, W.C. Messrs. Geo. Wainwright & W. Ernest Hazell, architects, 27, Moorgate-street, E.C. 1.—  
Higgs & Hill ..... } At schedule prices.  
F. & H. F. Higgs ..... }  
Dove Bros. .... }  
Holloway Bros. .... }  
Colts & Sons (accepted) ..... }

MAIDENHEAD.—For the erection of shop, warehouse, and stabling at No. 3, Park-villas, King-street, for Mr. Geo. L. Kirk, architect, Queen-street, Maidenhead.—  
Pardo Bros. .... £1,024 Chas. W. Cox & Son ..... £214  
Silver & Sons ..... 1,032 W. Creed ..... 823  
J. Freewing ..... 873 20 (All of Maidenhead.)

MAIDENHEAD.—For making alterations and additions to No. 6, Park Villas, King-street, for Mr. John L. Kirk, architect, Queen-street, Maidenhead.—  
Chas. W. Cox & Son ..... £1,024 W. Creed ..... £990  
Chas. Woodbridge ..... 1,032 J. Freewing ..... 873 20 (All of Maidenhead.)

NEWBURY (Berks).—For the erection of 11 farm buildings, Weston Farm, for Sir Francis Burdett. Mr. J. H. Mossey, architect, The Broadway, Newbury.—  
H. Hoskings ..... £1,700 G. Elms & Sons, Newbury\* ..... £1,510  
Accepted.

NEWHAVEN (Sussex).—For the drainage and sewerage of nineteen houses, Lewes-road, Newhaven. Mr. F. J. Rayner, C.E., surveyor and engineer, Newhaven, Sussex.—  
M. Woolger ..... £125 J. C. Cook ..... £127

NEWHAVEN (Sussex).—For the erection of a brick and iron building. Mr. F. J. Rayner, C.E., surveyor and engineer, Newhaven, Sussex.—  
Redman Bros., Newhaven ..... £100

NEWHAVEN (Sussex).—For kerbing, paving, &c., Lewes-avenue, for the Urban District Council. Mr. F. J. Rayner, C.E., Town Surveyor and Engineer, Newhaven. Quantities by Town Surveyor and Engineer, Newhaven, Sussex.—  
H. A. Chambers ..... £295 0 0 J. Grounds & Newton ..... £84 3 9

NEWHAVEN (Sussex).—For drainage and sewers of seventeen houses, Chapel-street, Newhaven. Mr. F. J. Rayner, C.E., surveyor and engineer, Newhaven, Sussex.—  
M. Woolger, of Newhaven ..... £135

NEWQUAY.—For the erection of Council Buildings, &c., for the Urban District Council. Mr. John Stanor, Jun., surveyor, Commercial-square, Newquay.—  
Tom J. Smith ..... £1,107 W. F. James, Newquay\* ..... £560  
Tippett & Cocking ..... 994 Accepted.

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, AND FIT FOR IMMEDIATE USE Telephone, No. 774 Holborn. Tele. Address "SNEWIN," London.

NOTTINGHAM.—For alteration of premises, offices, and stabling at Poplar-square, for the Nottingham Hide, Skin, and Fat Market Company Ltd. Mr. Robt. Clarke, architect, Prudential-buildings, Nottingham.—  
F. Wallis ..... £3,161 0 Hy. Vickers ..... £2,870 0  
Thos. Fitch & Son ..... 3,000 A. B. Clarke ..... 2,963 0  
F. Messom ..... 2,000 J. H. Vickers (accepted) ..... 2,747 10  
J. H. Williamson ..... 2,968 0

SWANSEA.—For the erection of additional wards at hospital, for the Corporation.—  
Jenkins ..... £380 0 Humphreys, Ltd. .... £310 0  
The Wire Works, Water-proof Roofing Co. .... 350 0 Chas. Marles, Brunswick-street, Swansea\* ..... 304 14  
John Gooding ..... 212 10 Accepted.

SYSTON (Leicestershire).—Accepted for the amended sewerage scheme, for the Barrow District Council. Messrs. Simpson & Harvey, engineers and surveyors, Leicester.—  
Mr. T. Philbrick, Leicester ..... £6 243  
[Lowest of seven tenders received.]

TUNSTALL.—For the erection of bank premises, for the Manchester and Liverpool District Banking Company, Limited. Messrs. Wood & Hutchings, architects, Town Hall, Tunstall.—  
Massey & Son ..... £5,246 W. Grant ..... £4,800  
Jno. Sanger ..... 5,154 C. Gough ..... 4,784  
Vyrke & Goodwin ..... 4,777 W. Cooke, Burnham\* ..... 4,722  
T. Godwin ..... 4,850 Accepted.

WANSTEAD (Essex).—Accepted for the erection of a school (one story) and a caretaker's cottage on the Cobbold-road site, for the Wanstead School Board. Mr. John T. Bresser, architect, 70 and 71, Bishopgate-street, Wills, E.C. 1.—  
Allied Reed & Son ..... £20 418

WHITBY.—For additions to premises, Skinner-street, to convert them into five shops with a boarding house over them, for Mr. James Gray, J.P. Mr. E. H. Smiles, architect, 5, Flowergate, Whitby.—  
Robinson Harland ..... £3,733 Chas. Winterburn ..... £3,445  
John Braien, Silver-street, Whitby\* ..... 3,480 Accepted.

## TO CORRESPONDENTS.

J. R. (amount should have been stated).  
NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.  
Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.  
We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## J. J. ETRIDGE, Jr.

SLATE MERCHANT, SLATER and TILER.

ESTIMATES GIVEN FOR SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor, Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to BETHNAL GREEN SLATE WORKS, BETHNAL GREEN, LONDON, E.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum (25 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances payable to DOUGLAS FOURDRINIER should be addressed to the publisher of "THE BUILDER," No. 45, Catherine-street, W.C. SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 10s. per annum (25 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## THE BATH STONE FIRMS, Ltd.

BATH, FOR ALL THE PROVED KINDS OF BATH STONE. FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

## HAM HILL STONE DOULTING STONE.

The Ham Hill and Doulting Stone Co. (Incorporating The Ham Hill Stone Co. and C. Trank & Son The Doulting Stone Co.). Chief Office—Norton, Stoke-under-Hill, Somerset.

London Agent—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C. 4.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

SPEAGUE & CO., Ltd., PHOTOLITHOGRAPHERS, 4 and 5, East Harding-street, Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

METCHIM & SON (10, GEORGE ST. WESTMINSTER) "QUANTITY SURVEYORS' DIARY AND TABLES," For 1899 will be ready shortly. [ADVT.]

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C. SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS, DAMP COURSES, AREAS, ROOFS, WASHHOUSE AND DAIRY FLOORS, &c., &c.

This Asphalte was chosen to be laid at Sandringham, on the new General Post Office, and other important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

# COPPER AND ZINC ROOFING. F. BRABY & CO.

LONDON, LIVERPOOL, GLASGOW, BRISTOL. 352 to 364, Euston-rd., N.W. 6 & 8, Hatton Garden. 47 & 49, St. Enoch-square. Ashton Gate Works, Coronation-rd.

VIELLE MONTAGNE SOLE MANUFACTURING AGENTS. NO SOLDER. NO EXTERNAL FASTENINGS.

Particulars on Application. Chief Offices: Fitzroy Works, EUSTON ROAD, LONDON, N.W.



# The Builder.

VOL. LXXV. No. 2917.

NOVEMBER 13 1894.

## ILLUSTRATIONS.

### Belfast Architecture:—

Business Premises, Arthur-street (Mr. Vincent Craig); Belfast Academy (Messrs. Young & Mackenzie); Principal Entrance to the Harbour Offices (Mr. W. H. Lynn, R.H.A.);	<i>Double-Page Ink-Photo.</i>
The Northern Bank (the late Sir Charles Lanyon); Presbyterian Theological College (the late Sir Charles Lanyon; additions by Mr. J. Lanyon); Queen's College (the late Sir Charles Lanyon)	<i>Double-Page Ink-Photo.</i>
Campbell College—four views (Mr. W. H. Lynn, R.H.A.); Business Premises, Donegall-square (Messrs. Lanyon, Lynn, and Lanyon); Belfast Charitable Society	<i>Double-Page Ink-Photo.</i>
St. James's Episcopal Church (Messrs. Lanyon, Lynn, and Lanyon); Sinclair Seamen's Church (Mr. W. H. Lynn, R.H.A.); Evangelical Union Church (Messrs. Young & Mackenzie); Carlisle Memorial Church (Mr. W. H. Lynn, R.H.A.); Newtownbreda Presbyterian Church (Mr. Vincent Craig); Bloomfield Presbyterian Church (Messrs. J. J. Phillips & Son)	<i>Double-Page Ink-Photo.</i>
Buildings for the Scottish Provident Institution (Messrs. Young & Mackenzie); Northern Bank, Royal-avenue (Mr. J. Lanyon); the Mater Infirmorum Hospital (Mr. W. J. Fennell)	<i>Double-Page Photo-Litho.</i>

### Blocks in Text.

#### Belfast Architecture:—

Harbour Offices	Page 446
Warehouses for Messrs. Preston, Smyth, & Co. and John Preston & Co.	" 447
Tower Buildings, Ormeau-avenue	" 448
Belfast Castle	Page 450

#### Belfast Architecture (continued):—

Crescent Presbyterian Church	Page 448
Free Library	" 449
All Saints' Church	" 451
Warehouse, Victoria-street.	" 451
	Page 452

## CONTENTS.

The Architecture of Our Large Provincial Towns	445	The London County Council	463	Sanitary and Engineering News	466
Notes	451	Applications Under the 1894 London Building Act	463	Foreign	467
Tradition and Material in Architecture	454	Books Received	464	Miscellaneous	467
Competitions	456	The Society of Arts	464	Capital and Labour	467
The Surveyor's Institution	456	Height of Buildings in Glasgow	465	Legal	468
Engineering Societies	457	The Recognition of the Architect	465	Meetings	469
Illustrations	458	The Student's Column.—Sound, Light, and Heat—XX	465	Recent Patents	466
The Architectural Association	458	Obituary	465	Some Recent Sales of Property	470
Architectural Societies	458	General Building News	465	Tenders	471

### The Architecture of Our Large Provincial Towns.

#### XIX.—BELFAST.



WHILE many of our chief towns have risen from insignificance to their present importance within the past century and a half or less, few can be compared, as Belfast may be, with the cities of the new world for youth and rapid development. Belfast is a creation of modern commerce. Up to the beginning of the seventeenth century there were no buildings upon its site beyond a castle that guarded a ford over the river Lagan, and possibly a few mud hovels. Though two separate proposals were made during the reign of Elizabeth to build a bridge over the river, neither of them came to anything, and Hollinshed in 1586 did not think the place worthy of mention. Even in 1613, when a first charter of incorporation was granted, there was a population of about 500 only, and the rateable value was but 400*l*. The population now is well over three hundred thousand, and the rateable value more than a million sterling; and it is the third port in the United Kingdom.

The castle, which stood on or near the spot that is still regarded as the chief centre of the city, and is known as Castle Junction, was finally destroyed by fire in 1708. It had been originally erected in the reign of Edward I. and several times destroyed and rebuilt in the wars between the English and the Irish before it was granted in 1603 to Sir Arthur Chichester. The date of that grant is really the date of the foundation of the town. The great development did not commence until after the civil wars, nearly half a century later; but from 1603 a commencement was made. In the following year a

fair was held, and, shortly afterwards, regular markets were established, and a market-house built, and then the charter was obtained. In 1685 the population had risen to 2,000, and in 1689 the bridge over the river, afterwards called the "long bridge," was at last built where the Queen's Bridge now stands, and Belfast was finally launched on an uninterrupted career of prosperity which has ever since increased in a geometrical progression. It was created a city by Royal charter in 1888, and is proud of the title of Lord Mayor, conferred upon the chief magistrate in 1892.

The city proper stands on the left bank at the mouth of the river Lagan, where it flows into the deep bay called Belfast Lough; but the extensive suburbs on the right bank really form part of it. The ground on both banks is low and level for some distance and makes an ideal site for the formation of docks, which, as every one knows, has been made the most of; the Belfast shipbuilding yards being some of the largest in the world, and a very large area being given up to quays, sheds, and warehouses connected with the shipping trade. There are, however, ridges of hill on the west and south-west over which the city extends. The streets in the heart of the town, the chief business part, are broad, well paved, clean, and bordered by handsome, lofty, and substantial buildings; but all round this there is a broad band of poorer districts, in which the buildings are chiefly small dwellings and shops with an occasional large factory, and where even the places of worship are rarely of much architectural interest. The thoroughfares even in these parts are broad, but the paving, both of the carriage-ways and footways, is generally composed of pebbles, and is trying to the feet and, one would suppose, difficult to keep clean. Beyond this band, on the north west and from east to west in the south, are streets of villas, many of them modern, which increase in size and importance as the city is

left behind; and standing among them are some of the chief buildings of architectural importance that Belfast possesses. Besides the paving of the second-rate streets, and the lighting, which is nowhere very good, but which will no doubt be improved now that the electric light is to be adopted, the nomenclature of the streets seems to require a little attention. To have two main streets in different parts of the town called Victoria-street and Great Victoria-street is as confusing as the similar case of Victoria-street and Queen Victoria-street in London; Donegall-street divorced from Donegall-place and Donegall-square, and all of them from Donegall-pass and Donegall-road, is worse. It is a pity even to have a College-gardens by Queen's College while College-street and College-square are near the old Academical Institution. There is perhaps less to be said against dividing up streets into very short sections called by different names; or, at any rate, there is something to be said on both sides; but it is very confusing to strangers, and seems carried to excess in Belfast. If it cannot be helped, the authorities might at least be very careful to put up the names at all points where there is a change and at all corners—a thing which seems to be done in but a half-hearted way in the commercial capital of Ireland.

A very great deal of building is going on, both in the outskirts of the town, where it is extending in almost every direction, and in the centre, which is being rapidly rebuilt. The local stone does not weather well, and many of the older buildings are faced with stucco, while even the stone ones have very generally been painted. Most of the new work is being done in red brick, frequently with red sandstone dressings, and generally with blue or purple slate roofs; a combination which fashion or circumstances no doubt force upon the architects, but which we do not think any skill on their part could make satisfactory.



## HARBOUR OFFICES. W.H. LYNN R.H.A. ARCHITECT.

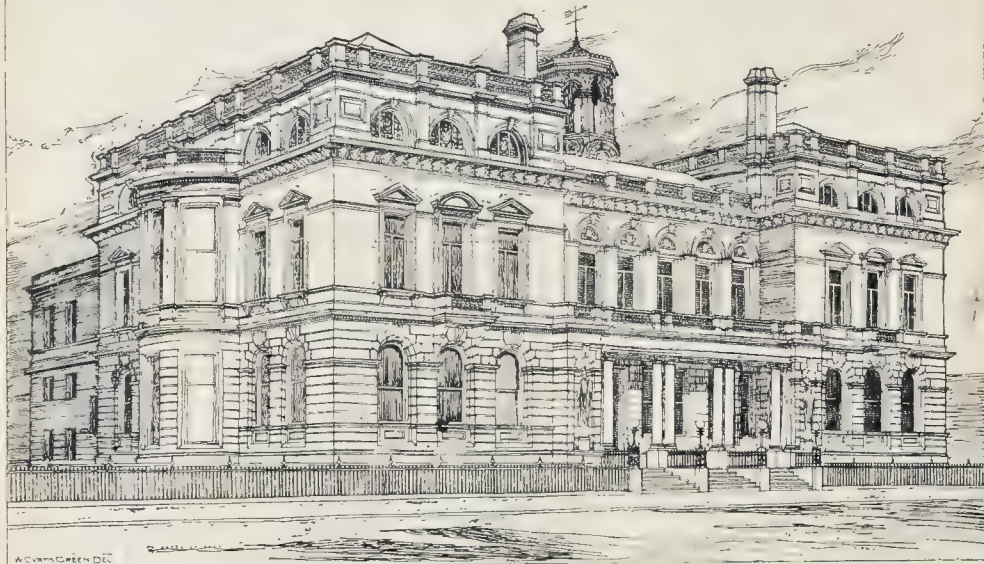


Fig. 1.

A peculiarity of the town, architecturally, is the comparatively frequent adoption in large buildings of a style resembling Italian Gothic of the heavier Tuscan type, but in several cases with round arches. Another marked, and altogether excellent, peculiarity is the almost universal raising of the ground floor of all important buildings to a considerable height above the street level, thus adding dignity to the structure and giving opportunity for a well-lighted basement. This very likely originated in the nature of ground, near the river, where any deep excavation for a basement would be liable to be flooded; but however it arose, it is a good feature.

On approaching Belfast from the sea, one of the most prominent objects the stranger sees while passing the docks on his way to the landing-stage is the spire of St. Joseph's Roman Catholic Church, the most effective feature of a small building in the Italian Romanesque style with rather incongruous Early French details. It consists only of a nave of four bays, covered by a wooden barrel ceiling, separated by composite pillars with grey granite shafts from narrow aisles, and a shallow sanctuary and flanking chapels. The entrance end and tower, which face the north, are built of a drab stone with red stone quoins and dressings, which time and dirt have reduced to almost the same colour; the way in which the lofty upper part of the tower, which is broader than it is deep, rises from the gable and changes to the spire form is, however, exceedingly well managed, and produces a striking effect. At the other end of the Clarendon Dock are the Harbour Board offices (fig. 1), by Mr. W. H. Lynn, a large, well-massed Renaissance building, with some strong features and good, ordinary detail. It is mainly two storied, but the blocks forming the wings of the main front have attics with a good deal of character. The broad, deep portico, of the Ionic order (see lithograph), projecting on the ground story beyond the wings, and stopped by solid masonry, is also a success. At the back of the building is a small clock-tower, with an elegant little octagonal belfry, which, like the spire of St. Joseph's, is conspicuous from the river and docks. At the top of Corporation-square is another building by the same architect, the Sinclair

Seamen's church (see lithograph), a very interesting and learned study in Early Italian Gothic, which shows the style as applied to a modern building to advantage. The main gable is divided up by the characteristic pilaster strips running up into the raking corbel table with its dentil cornice, and is pierced by the usual large traceried rose window and two smaller eyes. The lofty and well-proportioned tower, detached but for the porch, with its plain shaft and very open belfry, is also thoroughly in keeping, and the only feature that seems questionable is the range of little round-headed windows in the lower part of the main front; they, however, are no doubt wanted for light; though why the brick ring round them was introduced in the midst of the stonework we do not quite understand; possibly it was for the colour, but it looks cheap and out of place. The front of the Sailors' Home, also by Mr. Lynn, which is close by in Corporation-street, is of stone, in the Early English style, and has an absolutely flat face pierced with narrow slit windows, which give it a great deal of character though of an unattractive, not to say forbidding, kind that seems highly inappropriate. One has seen a similar stern and ascetic appearance affected by convents and clergy-houses, but it seems a great and an unaccountable mistake in a building of this kind.

The buildings facing Donegall Quay, between Corporation-square and the Custom House, are chiefly remarkable for their extreme ugliness. But the Custom House, a composition of the late Sir Charles Lanyon's, atones for them to a very great extent. It is a broadly-designed Italian Renaissance building raised on a rough basement, which, on the west side, supports a spacious courtyard reached by a broad flight of steps, an expedient that has an astonishingly dignified effect. The deeply recessed vaulted porch facing the quay is perhaps the earliest example of this favourite and very charming feature in Belfast public buildings. The almost excessive care taken to emphasise the windows in the middle on all faces is noticeable; on the north and south it is done neatly and judiciously, but the arched heads and enrichment on the east and west fronts have produced a

weak effect that rather defeats its own end. The details throughout, though refined, lack boldness. The Albert Memorial Clock tower, which stands near the Custom House, facing the bottom of High-street, was erected in 1865 from the design of Mr. W. J. Barr, and is about 140 ft. high. The strong vertical lines of the solid looking shaft, the broad spreading base, and light open lantern, as well as the treatment, always difficult, of the clock stage, are excellent. Perhaps, the vertical part of the lantern might have been a little shorter, or it might have been connected with the finials by flying buttresses with advantage, but that is all one need say. The statue of the prince under the canopy on the west face is well executed, though its position on a corbel 40 ft. from the ground might, perhaps, be objected to as undignified by the hypercritical. The material of which the tower is built is a coarse reddish sandstone, and the architectural details are of the heavy Early French Gothic type fashionable at the time. The Northern Bank (see lithograph), the long south flank of which faces the memorial, is another old-fashioned Classic building by Sir Charles Lanyon, who has made good use of the rare opportunity which a building of one lofty story gives an architect. The treatment is bolder than at the Custom House, and in that sense more satisfactory; and it is to be noted that, though the windows are of ordinary size, they are themselves cleverly made the main features in a composition which depends for much of its effect on large parts. The building is set upon a grey granite plinth, but the upper portion has lost all charm of surface and been made to look common and poor by being painted. St. George's Church, near the bottom of High-street, is only noticeable for a deep tetrastyle portico of the Corinthian order which bears under the pediment the arms of the sees of Down and Connor, and which is said to have been brought from the Earl of Bristol's palace at Ballyscullion on Lough Beg. A little higher up on the other side is the National Bank, a new building designed by Mr. W. Batt, and faced with buff terracotta and dark red bricks. It is lofty and full of small detail; some of the terra-cotta modelling is good, especially that under the corbels of the flanking turrets, but a good



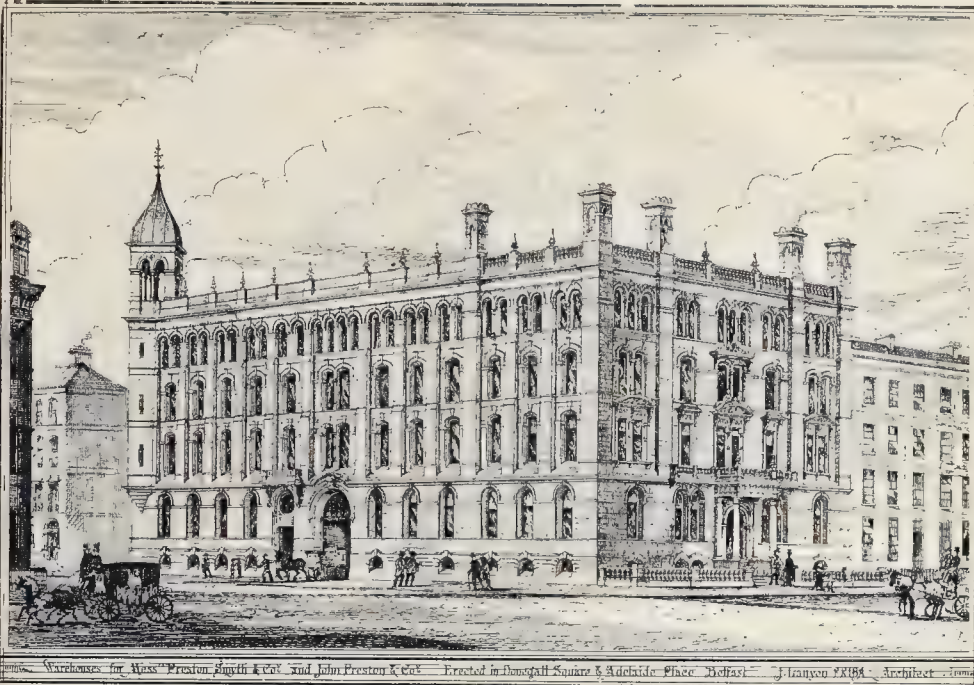


Fig. 2.

deal of it is wasted by being scattered in little panels. The best parts of the composition are the two doorways and their rich wrought-iron gates which, though rather over-full, are nevertheless very well designed. The building, generally, is over-elaborated, but is striking both in colour and outline. The front of the North British and Mercantile Insurance Company's premises, opposite, has some of the main characteristics of Flemish Gothic, such as crow's foot gables and shallow foliated surface arches within which the windows are set; but the details are rather French than Flemish, and a mixture of Gothic and Renaissance. There is an ironmonger's shop a little farther on, on the same side, which has a new, simple, and rather pleasing red sandstone front. There is a large draper's shop at the corner of Bridge-street, which might have been a success but for the material with which it is faced and an aggressive and ill-thought-out turret on the angle. The architectural features are of red concrete or similar material, and the surfaces between are cemented; the effect is most unpleasant, although the contours of the arched recesses, with their bay windows and gables, are good, and the idea underlying the composition clever. Messrs. Sawyer's new premises in Castle-place, by Mr. S. Stephenson, have an important, broadly-designed red sandstone front, which is simple and satisfactory from an architectural point of view. The older building occupied by the Scottish Widows' Insurance Company, at the corner of Lombard-street, is in the early French Renaissance style, with a small pilaster order to each story, and dormers which have steep gables and high, richly-carved pinnacles. As far as the general composition and main features are concerned, the architecture is both correct and pleasing, but it is spoiled by coarse detail, especially in the carving, and by lack of sufficient depth in the characteristic cockleshell cornice. The Ulster Club, near the top of the street, is a plain little old-fashioned building, with a painted front on

which are a broad, round bay window, and a rich frieze and cornice; not a very remarkable building, but suggestive of repose and comfort. The lofty new red-brick front of a grocer's shop, opposite (by Messrs. Phillips & Son), makes a pleasant note of colour in a drab street, and is not without merit as a piece of architecture.

In the Cornmarket, near the corner of which someone's exuberant fancy has led to the erection of one of the wildest and, architecturally speaking, least respectable house fronts in Belfast, is one stone building of three lofty stories that is noticeably better than its neighbours, and, next to it, one which, though of no merit as a design, illustrates the delightful colour-effect of salt-glazed bricks. Mooney's café, in Arthur-square, by Messrs. Watt & Tulloch, is a plain, ordinary red brick building in the upper part, without much character, and erected on a long, rather quick curve; the ground story, however, is pleasing; the windows are very large, excessively so for effect, but they are separated by piers built of a quiet blue-green glazed brick with Ionic caps of a golden-brown faience, and the walnut woodwork is well and architecturally treated. It is difficult to find much good to say of the Theatre Royal, opposite, with its medley of arcades and medallions. Style it has, no doubt, in its way, but it is the kind of style too much affected by some theatres, which seems to consist either in a deliberate ignoring of all styles or a perverse attempt to jumble them all together—one hardly knows which. It is a sensible relief to turn down Arthur-street, and look at the simple and substantial grey granite front of Messrs. Dunville's premises, designed by Mr. V. Craig. This is a two-storied building, similar to one of the Florentine palaces; the pediment seems to want an excuse for its existence in the shape of breaks in the front; the upper cornice might, perhaps, have been bolder with advantage and the lower one simpler; but it is good work, and seems rather lost in a little-frequented street. It is

worthy of remark that in this, as in several other cases in Belfast, the architect has had the good taste to leave the granite unpolished.

Donegall-place, wide and straight, and bordered by the best shops, is now the Regent-street of Belfast, as it was once its Park-lane. But its painted stucco architecture, though less monotonous, is no more interesting than that of Regent-street. The best old houses are two or three dating from the Greek revival period, one of which is at the corner of Castle-place, and another next to the Imperial Hotel. The sober grey granite front of the branch office of the Bank of Ireland, with its solid dignity, is a relief to the tawdriness of the other old work. On the north side of Donegall-square, on the site of the old "White Linen" Hall, a commencement is being made with the erection of the new Municipal Buildings from the clever and dignified design with which Messrs. Thomas & Son, the architects, won the recent competition.\* In the north-west corner of the square a lofty new white stone building, which promises to be an architectural success, is being erected by Messrs. Young & Mackenzie for the Scottish Provident Institution (see lithograph). It is a Renaissance design, five stories high, of which two are treated as a stylobate supporting an order of three quarter columns which run through the remaining three. The simple little red stone structure opposite, called Donegall-square Buildings, is also attractive. The principal erection in the south-east corner is Messrs. Richardson & Owden's offices, a great, square red stone block of five stories, besides attics, by Messrs. Lanyon, Lynn, & Lanyon (see lithograph). In general it is an essay—and a successful one—in Florentine Gothic, carried out with the characteristic mouldings and carvings; but there is Venetian feeling in the circles introduced into the spandrels of the arches, and particularly in the way in which the middle

\* See the illustration of this design in our issue of June 12, 1897.





Fig. 3.—Tower Buildings, Ormeau-avenue. (Mr. John Lanyon.)

windows are run together into arcades. In the milder climate of Venice they would probably have been open loggias. Passing by the great hexastyle Corinthian portico in painted stucco, which occupies the middle of the south side of the square, and behind which there is one of the recessed vaulted porches already referred to, one finds, at the corner of May-street, another, though less successful, Florentine Gothic edifice which belongs to the Diocesan Young Men's Society. It is faced with parti-coloured brickwork, which itself is out of keeping with the style, and the pointed segmental arches of the lower windows and one main door make matters worse. The cornice lacks definition and the balcony over the door is too shallow and too obviously merely ornamental. The building next to this, the gymnasium of the Church of Ireland Young Men's Society, an old painted stone structure in Grecian revival style, bears a puzzling inscription which calls it a memorial of Her Majesty's Jubilee of 1887; if architectural style is any guide, His Majesty King George the Third's Jubilee of 1810 must be meant; it is impossible to believe it dates from very much later than that. The May-street Presbyterian Church opposite is chiefly noticeable for the excellent red bricks of which it is built: it has a Roman Ionic portico "in antis" with very well executed capitals to the columns, and a pretty little attached structure at the side ornamented with a smaller order on very high pedestals. In May-street there are a number of little old-fashioned brick houses, the doorways of which are, like many in Belfast, a modification, peculiar to the town, of a form commonly used in the early years of the century. They have, flanking the door, a pair of little columns—in May-street they are of the Ionic order—carrying an architrave, but no frieze or cornice, with a fanlight over it; the whole being surrounded by a thin projecting moulding under an elliptical arch. They are pretty features, but we do not know that either the omission of the frieze and cornice or the elliptical form of the arch is any improvement upon the more usual arrangement. In Linen Hall-street, another turning out of Donegall-square, there is an office building that has a very rich Grecian portico, and looks as if it had once been a chapel. At

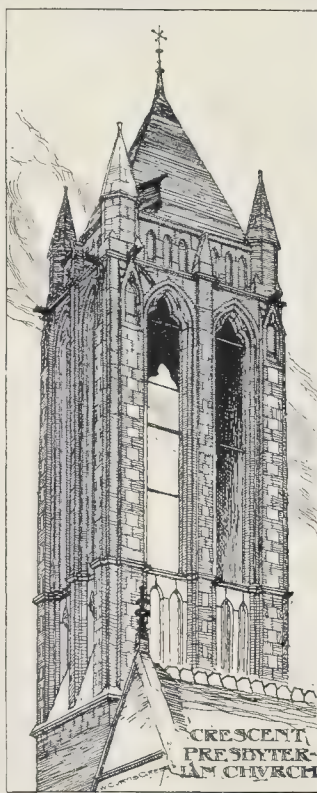


Fig. 4.

the junction of Adelaide-place with Donegall-square is a large warehouse block by Mr. J.

Lanyon (fig. 2), with some character in its treatment.

Bedford-street is mainly a street of large warehouses, of which the most conspicuous, since they are faced with stone and have some architectural character while the rest are plain white brick structures, are No. 3 and the one next it on the west. The latter is very florid, and a good deal of the work is in questionable taste, but the other is excellent. It is exceedingly simple, consisting of two rusticated stories forming a basement, and two above them brought together by piers between the windows, the piers being connected by arches at the top, and surmounted by a plain, boldly-projecting cornice carried on deep corbels; but such simplicity is appropriate, and the architectural proportions and details of the work are unexceptionable. The celebrated Ulster Hall, on the other side of the street, is an old painted, Renaissance building of no great merit. The little red sandstone Gothic drinking-fountain at the corner of Ormeau-avenue marks the beginning of a region of new, dark red brick buildings, mostly large warehouses, with very slight architectural pretensions, and rather dismal in appearance, an effect that is not mitigated by the almost universal use of black pointing and the occasional substitution of that truly horrible material, red concrete, for stone in the dressings. Even red stone is a mistake with these dark-red bricks; the want of a little colour relief becomes quite depressing. The most striking building in the avenue is a great block of warehouses, containing also the new White Linen Hall, which has square angle towers set diagonally, and was built, we believe, by Mr. John Lanyon (fig. 3). We have heard that it cost as little as threepence half penny a foot, but that sounds like a fairy tale. It rather dwarfs the little public bath next to it for which Messrs. Watt & Tulloch are probably responsible. The large old Roman Catholic Church, in one of the streets leading out of Ormeau-avenue, is a well-balanced composition with a good deal of breadth and dignity, but its "churchwarden" Gothic style deprives it of beauty or distinction. In the Old Dublin-road the Salvation Army Hall, by Mr. V. Craig, is the only building that calls for notice. It is not unattractive as a whole, but it reminds one of



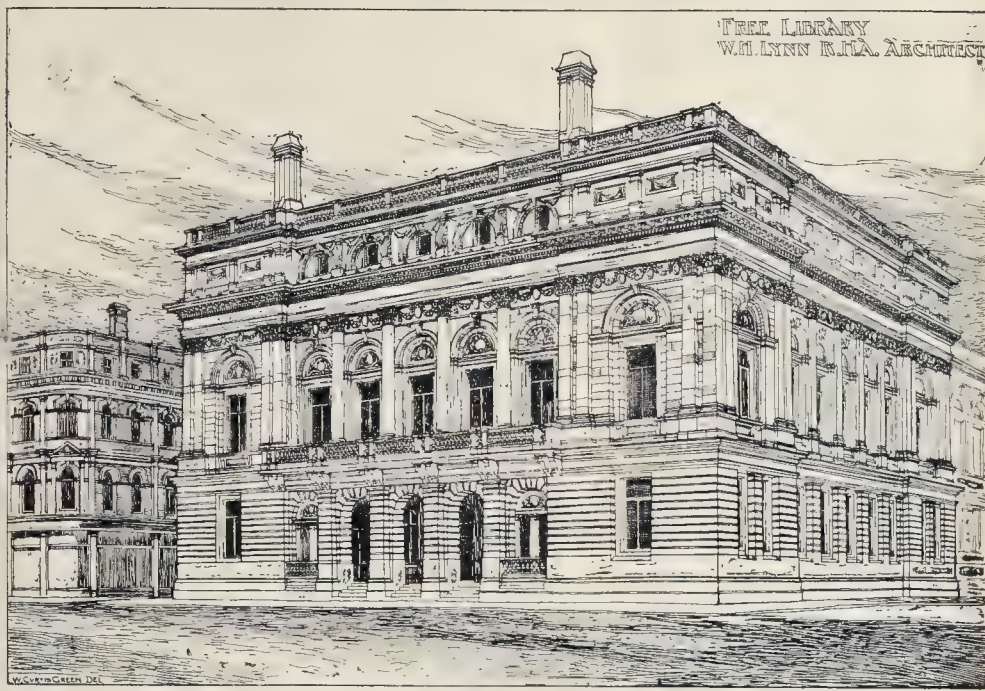


Fig. 5.

little of the Swedish statesman who was reported in one of the papers lately to have appeared at a State function in a military uniform surmounted by the black silk hat of a civilian; that is to say its classic cornice and "Queen Anne" gables do not seem to be very suitably set off by the battlemented turret with its Gothic mouldings and grotesque gargoyles. Conspicuously placed and close to each other, at the beginning of University-road, are three churches, belonging respectively to the Presbyterians, Moravians, and Methodists. The first is much the best architecturally, and has a remarkable and beautiful tower, almost half the height of which is taken up with an open belfry stage of high, narrow lights, crowned with a steep hipped roof, the lower part being quite plain (fig. 4). The church is built of grey rubble, with red ashlar dressings, and is in the Early English style, learnedly and consistently carried out, with due consideration for that depth and solidity of aspect necessary to obtain a good result, but too often forgotten. The Methodists' building is a large red brick one with black and white bands, relieved also by a little stonework, and has a tower which somewhat resembles an Italian mediæval campanile. The Moravian church is much smaller, and has only a little octagonal turret, rather spoiled by a too heavy cornice at the base of the spire. The materials are similar to those of the Presbyterian church, and the later Gothic detail is on the whole quite as good. To the north of the Lisburn-road are the fever hospital and the union workhouse, both dark, depressing-looking rubble stone buildings of late Gothic character, having gables and square-headed windows, with hood moulds and wooden mullions. The part of the workhouse facing the entrance gates is painted black, perhaps to render it still less attractive. It is a sad contrast to the row of sweet old-fashioned red brick houses opposite, called Royal-terrace, with their characteristic Classic doorways. The Deaf and Dumb Institute, next to the workhouse, a building of the

late Sir Charles Lanyon's, is a formally grouped, long, low edifice, with a high central lantern and a number of well placed and well formed gables, the Elizabethan character of which, however, is out of keeping with the other details which are all Gothic. The new "McArthur Hall," by Sir Thos. Deane & Son, a large new building for lady students, in connexion with the Methodist College and almost opposite the Deaf and Dumb Institute, admirably illustrates the advance that architecture has made since the latter was built. It is similar in style, and its purpose is sufficiently like for the contrast to be striking; but instead of a hard and formal composition, and what may be called regulation features and mouldings which, however consistent in style, are not always so in scale or position, we have a really beautiful edifice, most picturesquely grouped and with delightfully interesting details which, without being less in keeping with the style, are often original and always appropriate to their positions, and in scale with their surroundings. The Methodist College itself is again an older building and in the early Gothic style, which never seems quite suited to such a purpose or to execution in brick.

All Souls' Unitarian Church, in Elmwood-avenue, between the Lisburn and University-roads, is a gem of modern ecclesiastical Gothic architecture, not only the most beautiful in Belfast, but one of the best small modern churches we remember to have seen anywhere. Mr. Plank is the architect. It is a rough rubble building, with ashlar dressings and green slate roofs, late fourteenth century in style, consisting of nave and chancel under one roof, with aisles and clearstory, a low broad tower and spire, and a wooden porch. The squat tower, with its rich and original belfry stage, is especially charming, but the whole is carried out with rare taste and skill. The Elmwood Presbyterian Church, at the bottom of the same street, is a curious, original, and not altogether ineffective building, but it is rather difficult

to imagine what style the architect had in his mind when he designed it. The well-known Queen's College (see lithograph), by Sir Chas. Lanyon, stands almost opposite this church. Though scarcely calculated to satisfy the fastidious architectural critic of the present day, it is undoubtedly an exceptionally good piece of work for its time, not unworthy even to rank with Scott's Glasgow University—or the original part of it—which it is not unlike in character and general disposition, though not so large, and built mainly of brick. The central tower is cleverly supported by secondary ones on the inside angles of the projecting wings, and the proportions of the latter are much more pleasing, the height of the other causing it to look thin; a fault common to many similar towers of the same period, as is also the excessive height and tenuity of the buttresses and pinnacles. The gables that flank the main tower, the projecting oriel over the entrance, and the two-storied bays on the smaller towers, are all well conceived, as are also the long ranges of high square-headed windows. The details are good for the period, though the forms of gables and battlements, as in the case of the buttresses and pinnacles, leave something to be desired. The building stands well, with broad, well-kept lawns in front of it, and is not unworthy of its reputation. The detached red and black brick building to the north, in early Gothic style, which at first sight looks like the chapel, is the library, and is a later addition by Messrs. Lanyon, Lynn, & Lanyon, and, though not altogether unworthy of the original, is certainly not equal to it. The still later buildings to the east are plain and unpretentious compositions in late Domestic Gothic, with gable ends and simple square-headed mullioned windows; the best is the house at the north-east corner. Com-

\* These are not shown in the illustration, which is from a water-colour drawing apparently made before the building was erected, and sent to us by Mr. Lanyon (the son of the architect). The gables referred to are introduced as projections in the second bay on each side of the central tower, and are a great improvement to the composition. In other respects the drawing represents the building as carried out.



paring those in which white stone is used for the dressings with those that have red, the case for the former is easily seen to be overwhelmingly strong. In the whole group, too, the colour discord between the red brick and the blue slate roofs is so marked that the veriest philistine must notice it as soon as it is pointed out. The Presbyterian College (see lithograph), which stands to the east of Queen's College, and is also by Sir Charles Lanyon, is, with its four great Doric columns and raised centre, quite as impressive a building in its way, and notwithstanding its much smaller size, as the other. It is perhaps a little spoiled by the over elaboration of the rustications round the ground floor windows, which consequently seem to want scale and boldness; but the simplicity and massiveness of the rest, the deep recessed porch and carefully treated centre, are worthy of the best days of the Italian Renaissance. It is a pity that the later additions, by Mr. John Lanyon, are not equally good. South of the colleges are the Botanical Gardens, a well-kept and picturesque public park, and beyond them an old neglected graveyard. And to the south-west is an extensive new quarter consisting almost entirely of villas and small houses of no architectural interest, a wilderness of red brick of which the eye wearies until it is ready to welcome as a relief the worst and weakest of sham half-timber gables. Before returning towards the middle of the town one may just notice that in Rugby-avenue there is a plain and unassuming new brick Gothic church by Messrs. Young & Mackenzie (see lithograph), and in Fitzroy-avenue an over-ornate one in rough rubble stonework, which, however, has a broad end gable of pleasing proportions.

We have been told that the Great Northern Railway station in Great Victoria-street was designed by Sir Charles Lanyon, but we think there must be some mistake: it is not improbable that he built the Northern Counties station in York-street, but although the other forms a dignified and well-balanced group, it is impossible to believe that the architect of the Custom House, the old Northern Bank, and the Presbyterian College can have been guilty of using the coarse, mongrel details of the Great Northern terminus. Even if the details could be forgotten, it would not now be an ornamental structure; for its chief beauty, its spacious, projecting Doric portico, has been built up and a great ugly iron and glass cab shelter added in front of it. Such things must no doubt be done, or at any rate they will be done, when public convenience demands them, and so long as public taste is not thereby offended; but it is obvious there must be something wrong somewhere when buildings of all kinds are treated in this way and no one sees any objection except a few experts. Is it the experts or the rest of the world who are wrong? Almost next door to the station is the Grand Opera House, a grotesque, new, red brick erection, with bright yellow stone dressings. Judging by two turrets surmounted by onion-shaped domes, the effort apparently made to escape from all known architectural forms is possibly intended to suggest something Oriental. It is certainly bizarre enough to force itself upon the attention of all passers-by; which, again, is perhaps what was chiefly wanted. Apart from some old churches with classic porticoes, of which the Fisherwick Presbyterian Church is the most important, there is nothing of any architectural interest in the neighbourhood of College-square but the Royal Academical Institution itself, and it would be gross flattery to call that interesting, except as an example of the ingenuity with which our predecessors could give a little architectural dignity to a building at very small cost. The structure is a large rectangular brick one, with no ornaments but a few vertical strips of stucco dividing it into unequal sections, and carrying a plain stucco entablature. It stands in an extensive enclosure, and the land must shortly become, if it is not already, exceedingly valuable; which now makes its poverty-stricken appearance the more remarkable. With regard

to the Cooke statue in front of this building, one cannot but notice that the polished red granite pedestal is a mistake, its colour and sparkle tending too much to draw the eye to itself and away from the figure. In Wellington-place and the south part of Queen-street there are several new buildings, all, by-the-by, faced with red brick, of which the most noticeable is the premises of the Young Men's Christian Association, by Messrs. Young & Mackenzie—a lofty block flanked by a picturesque octagonal turret, and surmounted by one large gable and two smaller ones, which are blank, and the purpose of which it is rather hard to understand. If they could have been omitted, and the larger gable put at the other end to balance the turret, the composition would have been a much more satisfactory one; failing that, it would have been better to do without gables. The only building of interest in the northern part of Queen-street is the Working Men's Institute, at the corner of Castle-street. It is a square red brick edifice, with a superficial resemblance to an Italian Gothic palace in its ranges of heavy, pointed arched windows, in the way in which they run together into arcades in the lower stories, and in the balcony in front of the middle window on the first floor. But a closer attention to detail was wanted to make either a satisfactory imitation of the model or an excellent piece of architecture. The carved ornaments of the doorway to the Roman Catholic Church in Chapel-lane are worth looking at, and it is worth while also to make an excursion from this point to see St. Peter's Church in the poor neighbourhood about the Falls-road. It is an ambitious building, by Mr. A. Jackson, in the earlier Decorated Gothic, with occasional lapses into the later Decorated in the window tracery. Externally, it has the look of a very small cathedral, with its two western towers and spires, its double doorway, large seven-light window in the gable, and its group of attached buildings at the east end. Inside, one finds it to consist of a nave and chancel, under one roof, with aisles and a polygonal apse. It is satisfactorily, if not actually well decorated in colour, and has some fairly good stained glass in the large apse windows and a handsome altar-piece. The architectural details, too, if not beyond criticism, are above the average. The Townsend-street Presbyterian Church in the same part of the town is worth a visit for the sake of its rich and effective French Romanesque doorways.

Castle-street contains nothing of architectural importance, but there is some quiet dignity about the plain red stone part of the new flank of Bank Buildings. Turning into Royal Avenue, a modern thoroughfare formed through one of the poorest parts of the old town, the first building on the left, standing a little back in a prominent position at the broad entrance of the street, is the Provincial Bank of Ireland. It is a curious composition that pleases almost in spite of one's better judgment. It may be described as a formal Classical building, with features that are mainly excellent imitations of Romanesque work. The cornice, however, is an ordinary Classic one, with an Early Gothic enrichment in the pediment and parapets that are more Gothic than anything else. Yet, in spite of this odd jumble, we confess to finding the general effect satisfactory. The Ulster Reform Club, which comes next, has a well designed red sandstone front and return, broken, above the balcony at the first-floor level, by a series of lofty bays. The style is that new version of the Renaissance, derived through the so-called Queen Anne, by discarding its most bizarre features and its very fine mouldings; and the building would no doubt be a pleasing one if it were not spoiled by a weak turret on the angle which inevitably attracts the eye to its unworthy self. The narrow front of the workshops for the Industrious Blind, by Mr. G. Ferguson, is quiet, well composed, and well detailed up to the main cornice, above which it falls off and comes to a rather impotent end. The new Post Office, for which the Office of Works is

responsible, we find a strikingly satisfactory building, considering that the details do not show much knowledge, and that round-headed windows are unknown in the style in which, presumably, it is intended to be designed. The good effect is, without doubt, due to the broad wall spaces, the grouping of the windows, and the bold machicolated cornice, a boldness well carried out in most of the other features. The new front of the offices of the Water Commission, opposite designed by Mr. W. J. Fennell, though less markedly original, is also very satisfactory. We doubt the policy of introducing grey granite shafts among the red stonework, and the carved ornament is rather hard and liney, but the work generally is excellent, and the projecting balcony an especially happy feature. The only other thing in this part of the street that is worthy of notice is the terra-cotta detail of No. 72, especially of the first-floor windows, in designing which the possibilities and limitations of the material have evidently been wisely considered. In North-street, on both sides of Royal-avenue, are a number of new blocks of offices and commercial buildings (almost all faced with red brick), which are favourable examples of their class. That which includes Nos. 33 to 47 may be especially mentioned. The Avenue Hall, at the corner of Garfield-street, though very plain, is, perhaps, even better, it is certainly more refined. There are only two buildings worthy of note in the part of Royal Avenue beyond North-street, namely, the Northern Branch Bank by Mr. John Lanyon (see lithograph) and the Free Library. The former exhibits a rather original treatment of a narrow front in comparatively strict old-fashioned Renaissance style. Its marked features are two narrow end pavilions with little open loggias at the top and projecting square oriels which have probably a German origin. The pavilions are connected by a solid entablature carried on two Ionic three-quarter columns. The ground-floor windows are filled with well-designed iron grilles, and the building is remarkable for the care with which the scale is kept throughout a rather complicated composition. The Free Public Library, by Mr. W. H. Lynn (fig. 5), is the most striking, as well as architecturally the best, public building in Belfast. It is of red sandstone and Classic in style, inspired, probably, by French models of twenty or thirty years ago. As our illustration shows, the ground-story is rusticated in the French manner, the horizontal joints only being marked; but this is in keeping with the rather delicately-proportioned order above. The weakest point in the design seems to us the carved tympana over the first-floor windows, or, rather, the putting of square-headed windows in round-headed openings, which necessitates such a filling up. The treatment of the attic, on the other hand, is happy and appropriate. There is a general air of refinement about the composition unusual out of France and a little out of tune with British tradition—but that, perhaps, does not matter in Ireland; in any case it is rather a pleasant change for once in a way. The Gothic front of the Independent Church in Donegall-street, by the late Raffles Brown, is a grand architectural conception spoiled by a lack of taste and knowledge in the execution which was almost inevitable in the early days of the Gothic revival. St. Patrick's R.C. Church, further up the street, is also a clever composition, with a striking and effective tower and spire; but the detail is too heavy even for the Early French Gothic in which it is designed, and there is, perhaps, too much of it. Just beyond this, at the bottom of Clifton-street, is the "Old Poor House," now the headquarters of the Belfast Charitable Society (see lithograph); the oldest structure in Belfast with any architectural pretensions. It only dates from the last quarter of the eighteenth century, and, though a large building, its pretensions are modest enough, but it is rightly treasured in the town. It is in brick, with a stucco cornice,





Fig. 6.

Fig. 7.—Warehouse, Victoria-street.  
(Messrs. Young & Mackenzie.)

&c., and consists of a large middle block and lower end ones connected together by long one-story wings. A lofty octagonal tower and spire in stone stands behind the central pediment, but is so out of keeping with the rest that it scarcely seems to belong to it. The structure stands well on rising ground behind a long garden, and has an appropriate air of homeliness. Messrs. Young & Mackenzie have tried to suggest a military character in the new Soldiers' Home in Clifton-street by crenellating some of the parapets, but the composition is not a success; we even prefer the block called Hapover House, which stands next to it. At the top of the street there is a group of what appears to be four churches, one of them being, however, a school attached to the Carlisle Memorial Church, which was designed by Mr. W. H. Lynn, and is the most important building belonging to the Methodist community in Belfast, and a very good example indeed of a modern church in the Early English style, excellent in composition, in proportions, and in its details (see lithograph). The school is not by the same architect, and, though superficially similar in style, is not in the least a worthy addition to the church buildings. Of the other two churches, St. Enoch's, by Mr. A. Jackson, is the better; but neither will bear comparison with the Methodists' buildings. The new red brick buildings of the Mater Infirmorum Hospital in the Crumlin-road, by Mr. W. J. Fennell (see lithograph), are noticeable for their unpolished grey granite dressings. There is a satisfac-

torily designed porch to the middle block, but the angles are badly weakened in appearance by being carried on the middle of bay windows. The ward block seems too much crowded up against the middle to get proper light and ventilation. The Court House and Gaol, by the late Sir Charles Lanyon, which, a little beyond the hospital, face each other across the road, are both good and appropriate pieces of architecture. The greater part of the gaol is of course very plain, and hidden by high walls, but the entrance gateway, flanked by lodges, is a delightful little building. The lodges are two-storied square blocks, pierced by small windows, and connected by a screen wall, in which the arched gateway is pierced, and in front of which are a row of sturdy Doric columns. The entablature is carried round the lodges, and is there surmounted by a parapet. The whole structure, including the columns, is heavily rusticated, and, with the deep reveals to the openings, looks as solid, satisfactory, and appropriate as it well could. The Court House is a square, dignified building, in "Palladian" style, with a Corinthian pilaster order running through its whole height, and a deep pedimented portico. Shadow effects are cleverly obtained by recesses in the wings filled up in the lower part by open loggias, and by the recessed porch so often mentioned; it is needless to say that the proportions and details are excellent.

Near the north-west extremity of the city, at the corner of the Cliftonville-road, is St. James' Church (see lithograph), a very well-

designed modern building, by Messrs. Lanyon, Lynn, & Lanyon, in the Decorated style, with an effective and well-proportioned spire. And a little way up the road is the Belfast Academy, a rather severe looking building, by Mr. W. H. Lynn, designed in the appropriate late Gothic style, and built of uncoursed dark coloured rubble. It has the usual collegiate arrangement, with a heavy square tower in the middle, in which is a rich, deeply-moulded doorway, under a four-centred arch, with the inevitable oriel window over. There is an obviously intentional peculiarity in the upper windows, which have semicircular heads to the lights; it does not seem any improvement on the usual form, but is not in the least unpleasant and was perhaps worth doing for the sake of a little originality. The Northern Counties Railway station, at the end of York-street, has already been once referred to. It is a good and effective piece of Renaissance design, carried out in painted stucco; the additions now being carried out must, no doubt, to some extent spoil the original balanced composition, but that could hardly be avoided, and some effort seems to have been made to make them as little objectionable as might be. St. Paul's Church, opposite, is a generally satisfactory little building by Messrs. Lanyon, Lynn, & Lanyon, rather spoiled by a weak bell-turret. Gallagher's tobacco factory in York-street, by Mr. S. Stephenson, is an enormous block of red brickwork, five stories high, impressive from its size as well as from a certain architectonic character which the architect has succeeded



in giving it. The new Friends' Meeting House, in Frederick-street, may be mentioned as a satisfactory building of a plain sort; and the old parish church of St. Anne's, in the south-east part of Donegall-street, is interesting for the moment as soon, perhaps, to disappear to make way for the proposed cathedral. Among the important modern commercial buildings in this street, the Brookfield Linen Company's premises, by Messrs. Lanyon, Lynn, & Lanyon may be especially mentioned, as well as the old Belfast Bank at the corner of Waring-street, opposite the handsome Commercial Buildings, a broad, dignified, Classic front in grey granite, dating from 1820. Another very important building in Waring-street is the Ulster Bank, one of the most ornate and striking pieces of architecture in the Italian Renaissance style in Belfast. At the bottom of this street one turns again into Victoria-street, opposite the unsatisfactory building of the Amicable Assurance Society, with its restlessness and its weak-rounded corners with round-headed openings

in them. At the other end of the street are the now inadequate and unworthy municipal buildings, erected in 1870-71 by Mr. A. Jackson; a red brick structure with red stone dressings, raised on a rough plinth, and consisting of two stories of round-headed windows of a sort of pseudo-Gothic kind. Behind it is the Fire Brigade station. There are a number of new red brick commercial buildings near this end of Victoria-street, and in Victoria-square, and at the top of the latter there is the old Town Hall, but none of these have the slightest architectural interest. The little Empire Theatre, opposite the old Town Hall, may, however, be mentioned as a rather less grotesque parody of architecture than the other theatres. The front of a warehouse in Victoria-street, by Messrs. Young & Mackenzie (fig. 7), is simply but effectively treated. South of the Municipal Buildings are the extensive markets, and, on the other side of the Albert Bridge, the new electric-light station, opened a few weeks ago by the Lord-Lieutenant. It was designed, like the

gas works on the Ormeau-road, by Messrs. Watt & Tulloch, and is certainly the best piece of work in the town by this firm. On the Ormeau-road, beyond the river, one of the first buildings is the Cooke Centenary Memorial Church, by Mr. W. J. Fennell, and then comes the surrounding region of villas and small houses gradually giving way to larger houses, and then to the open country.

Among the important buildings rather in the outskirts that in the city is the Campbell College, a very picturesquely grouped building by Mr. W. H. Lynn, and remarkable for its refined taste and reserve of style; of this some illustrations will be found in our lithograph pages. Belfast House, a modern Gothic mansion by Mr. John Lanyon, may also be named, and the illustration of it (fig. 8) forms an appropriate and decorative close to our article.\*

\* This series of illustrated articles was begun in our issue of September 26, 1896. A list of those towns already dealt with will be found on page xxi. The last of the series (Dublin) will appear on January 7.



Fig. 8.

## NOTES.

THE twelfth general meeting of the Egypt Exploration Fund, held on Thursday of last week, was very well attended, and the Report of the Hon. Secretary and the statement of the Chairman (Sir E. Maunde Thompson) gave a most satisfactory account of the important and interesting work which the Fund is carrying out. The Fund has now three branches, the original "Egypt Exploration Fund," the "Archæological Survey Fund," and the "Græco-Roman Branch," the last instituted, and which has already produced the remarkable first volume of "Oxyrhynchus Papyri" (noticed in our columns a short time since), to which we are promised a second volume of even greater interest. The interest of the Oxyrhynchus Papyri is chiefly literary and social; the other researches of the Fund are, however, such as are more usually understood under

the term archæological. At the temple at Deir-el-Bahari the repairs and the replacing of sculptured stones, carried out by Mr. Howard Carter under the advice of Mr. Somers Clarke (to whom the chairman said they were especially indebted), are all but completed; there remains the drawing of the sculptures, entrusted to Mr. Howard Carter and Mr. Sillem, in order to complete the materials for the publication which is to be brought out under the editorship of M. Naville. Professor Petrie, who addressed the meeting, described his researches in the cemetery at Denderah, in which a great number of objects of historic rather than artistic value had been found, and which had thrown a good deal of light on some chapters of Egyptian history. Arches were found in some of these tombs of the date of 3,500 B.C., the oldest pieces of arched construction which had come to light. Another interesting fact which he mentioned

was in regard to the successive changes in the shape and orientation of the tombs. The older ones, which dated from about the close of the IIIrd. Dynasty, were square on plan. At the period of the VIth. Dynasty they assumed an oblong shape with the longer axis always north and south; at the XIth. Dynasty the oblong form was still maintained, but the longer axis was always east and west. Whether these changes had anything to do with ritual, or were merely the result of circumstances of locality, Professor Petrie did not suggest; though this is surely a very important point in connexion with the subject.

City and Guilds Institute. THE Report of the Examinations Department of the City and Guilds of London Institute for 1897-98 records a continued increase in the work of the Department. As compared with last year there is an increase of 82 in the number of classes, of 2,833 in the



number of students, of 1,196 in the number of candidates for examination, and of 833 in the number of passes. The increase of numbers is partly due to the addition of new subjects which have been added from time to time to meet the requirements of fresh industries and sections of trades. In some important branches, such as mechanical engineering and plumbers' work, there is however a decline in the number of candidates. On the other hand it is stated that in most branches of the building trades there has been a marked increase in the number of candidates for examination, and in most of the subjects a similar increase in the attendance of students at the classes. The percentages of passes show also an improvement in the standard of work. This furnishes one evidence among many others that there is at present an increasing desire for adequate instruction in the technical processes connected with building.

Mr. John Hughes writes:—  
Composition of "Under the above heading the Ancient Mortar." *Builder* of June 18, 1892, contained an article by the writer, in which the analyses of eight specimens of mortar taken from the ruins of old English castles and abbeys, together with photo-micrographic illustrations of the physical appearance of the sand used in making such mortar, were fully recorded. This contribution was supplemented by another article published in the *Builder* of February 11, 1893, in which the analyses and illustrations of eight more specimens of other old ruins were published. The object of this communication is to place on record an additional analysis of mortar from Tintern Abbey, as follows:—

## COMPOSITION OF MORTAR FROM TINTERN ABBEY.

Samples taken.	1892.	1897.
Water lost at 212 deg. Fahr. ....	172 ...	133
Combined water and loss on ignition .....	308 ...	240
Lime .....	1884 ...	1845
Magnesia .....	0'32 ...	'66
Potash .....	0'02 ...	'43
Soda .....	0'27 ...	'72
Oxide of iron .....	1'09 ...	1'95
Alumina .....	1'36 ...	1'90
Sulphuric acid .....	1'37 ...	1'21
*Carbonic acid .....	12'13 ...	12'90
Chlorine .....	0'13 ...	not done.
Gelatinous silica soluble in alkali .....	6'20 ...	6'05
Insoluble matters (sand) .....	51'67 ...	52'00
	100'00 ...	100'00
* Equal to carbonate of lime .....	27'56 ...	29'31

County Medical Officers of Health. **THOUGH** the *Times* has not the authority it had in bygone days, it is still an influential organ of intelligent general opinion. We therefore hope that the sermon which it preached last week on the desirability of every county having a Medical Officer of Health will bear fruit. Some English counties already have such an officer, others have not. In our opinion it ought not to be left to the County Councils to appoint such an officer according to their own will, but the Legislature should make it compulsory that they should do so. As the most energetic and enlightened County Councils have already made these appointments, such legislation would only be required in order to bring the more backward Councils into line at once. Sooner or later such an officer will be appointed in every county, but this ought to be done at

once. We have insisted over and over again on the necessity of large districts for the purposes of effectual sanitary supervision. A County Medical Officer of Health can do more effectual work than a dozen local officers, who have to study local prejudices and their own professional position.

Organ Case,  
Westminster  
Abbey.

**THE Dean of Westminster** appeals to the public for funds to complete the organ case designed by the late Mr. Pearson. The northern section of the case was built as a monument to Purcell; that is, the money was subscribed with that special object. The pipes of the swell organ, opposite, are still without their decorative screen, and the design of the case incomplete; 1,000*l.* is required to complete it. We hope the money will be subscribed; but why should not the whole completed organ-case be regarded as the monument to Purcell, and subscribed for accordingly? To commemorate Purcell by half an organ-case seems rather a half-hearted proceeding.

The  
Widening of  
Holborn.

**WE** regret to learn that the opportunity afforded for commencing the widening of Holborn at the point between Southampton-row and Southampton-street, by the demolition of the District Post Office, has been lost, apparently by a mere piece of vacillation on the part of the Improvements Committee of the London County Council. They had brought up a Report at one meeting of the Council recommending that the street should be widened by 10 ft. at that point, which owing to pressure of business was not dealt with; and at the next meeting brought up another Report withdrawing their previous recommendation. This has been a stupid business, and it would be rather interesting to know what were the reasons which induced the Improvements Committee to abandon a recommendation which was seriously called for.

Tesla's Electric  
Power Scheme.

**A FULL** description of a startling and novel scheme for transmitting power without the necessity of connecting wires is given in the *New York Electrical Review*, of October 26. The method was invented and patented by Nikola Tesla, the well-known electrician, and owing to the skill with which he has developed the receiving and sending apparatus, is, theoretically at least, perfectly feasible. It is well known that the conductivity of the air for electric discharges increases as its pressure is diminished, and hence no great pressure is required to produce a discharge through rarefied air. The main feature of Tesla's invention is to produce, by means of a special transformer, enormous electrical pressures, measured by millions of volts. At the power station, one terminal of the transformer is put to earth and the other is taken to a great height—the top of a mountain, for example. A similar arrangement is made at the receiving station. Owing to the greatly superior conductivity of the higher stratum of air, there will be comparatively small leakage, and hence a great portion of the current will be transmitted direct to the receiving transformer. This method has nothing in common with the ordinary systems of wireless telegraphy, as the power is transmitted by conduction and not by radiation. From the photograph

given of the Tesla transformer-in action, we can see how powerful it is as the streamers coming from the terminal cover an area of 200 square feet. The voltage employed must be considerably over a million. If any serious attempt is made to carry out Tesla's scheme in practice the effect of these high tension discharges in the upper strata of the atmosphere on the meteorological conditions of the countries traversed by them will have to be considered, as the effects may not always be beneficial.

Vinegar-yard  
Catherine-street.

It is stated that the London County Council have arranged with the Duke of Bedford that Vinegar-yard shall henceforth be closed as a public thoroughfare for the purpose of converting it into a *cul-de-sac*, to be covered over as a shelter for playgoers whilst waiting for admission into Drury-lane Theatre. The existing footway leads out of Catherine-street (formerly Brydges-street) to Cross-court and Marquis-court, Drury-lane, passing by the site of the pit-entrance of Garrick's theatre; the doorway, which remained until 1884, being the last relic of the house built by Wren, is mentioned by Charles Lamb in his essay, "My First Play." At one time the name "Vinegar-yard" was common in London; here, in the vicinity of Covent Garden, as in two other places similarly situated, it is, perhaps, a corruption of Vineyard, or Vine-garden, yard. Cunningham says it was built *circa* 1621, and cites the burial-register of one "blind John out of Vinegre-yard," on February 4, 1624. Yet it has other claims upon our remembrance. Two hundred years ago the "Rose" tavern stood at the corner of Russell-street, by the theatre's north-west corner; southwards, at the north-west corner of Vinegar-yard, stood the "Windmill" tavern. In Vinegar-yard was born Fanny Barton, the Mrs. Abington painted by Reynolds, and the yet unrivalled impersonator of Lady Teazle and Miss Prue. In the first floor room of the "Crown" (opposite the theatre-door known as "Lady Burdett-Coutts's") the first contributors to *Punch* used to meet for the weekly dinner; the room was afterwards frequented by the Reunion Club and by their successors, in 1857, the Savage Club. The (old) Eccentrics Club migrated from Chandos-street to the "Crown," and thence to the "Sutherland Arms" in May's-buildings, St. Martin's-lane. The west-end of Vinegar-yard is named "Little Bridge-street" in John Gwynne's plan of 1766, in Horwood's large-scale survey of 1799 it appears as "Wooburn-street."

Buildings in  
Hurricane  
Countries.

**WRITING** in reference to the St. Vincent hurricane, Mr. Blashill makes a most practical and pertinent suggestion in the *Times* with regard to the suggestion of the Bishop of Barbados that churches, rectory-houses, and schools in the island of St. Vincent should be rebuilt "as they were before the storm." Mr. Blashill points out that as some buildings survived the hurricane it is obviously possible to erect buildings in such a manner, either by additional strength or additional elasticity, that they should withstand a hurricane; that this ought to be the object to be kept in view; and that to merely rebuild the destroyed structures "as they were before" would be a foolish and inconsiderate proceeding. It is to be hoped that this sensible piece of advice will not be lost sight of.



THE New English Art Club. THERE is less of eccentricity than usual in the present exhibition of the New English Art Club at the Dudley Gallery, although we are not altogether spared—witness Mr. Wilson Steer's "Ludlow Castle" (61), which suggests a landscape in worsted-work, or Mr. Bauer's interior of a "Mosque at Delhi" (13), a mere raw expanse of roughly indicated detail, without shadow or aerial effect. Mr. C. H. Shannon's half-length portrait of a man (72), occupying the central place at the top of the room, has dignity of expression and line, though with an unnecessarily flat treatment. Among the experiments in light effect, which are commonly among the interesting points in the exhibition, are to be noted Mr. W. W. Russell's "Under the Trees" (101), and Mr. Lindner's "The Maas of (at?) Dordrecht" (49). The most free and powerful bit of landscape in the room is again by Miss Alice Fanner—"Swaledale, Yorkshire" (106); this artist is a real gain to the exhibition, and might claim a more prominent position. "The Double Lock" (102), by Mr. Bertram Priestman, is a fine landscape in composition, though somewhat dolorous in colour. Mr. George Thomson is more successful with a portion of St. Paul's (99), with the columns of the north porch standing out white in a glint of sunshine, than he was with a view of the whole building last year. Mr. Strang has a capital etched portrait of Mr. Kipling (15), and a weird and ugly symbolical picture of Death as "The Drummer" (56), in which the result is not worth the talent expended in producing it.

Fine Art Society's Gallery. THE collection of water-colour drawings by Mr. Alfred East, at the Fine Art Society's Gallery, comprises a number of sketches in the Midlands of England, and at Aix-les-Bains, Savoy, and Northern Italy. The note to the catalogue informs us that they are the accumulation of several years, some having been done as studies for important pictures, but the majority in order to preserve a fugitive effect. As such they form an interesting and varied collection. They naturally show a considerable difference in style, according to the time at which they were done; dates are not given, but one may assume that such sketches as "An Autumn Evening" (6), "The Bridges at Bourton-on-the-Water" (20), and "The Mill Brook" (29), with others, represent one phase of work and were done about the same time, the treatment and colour effect is so similar in each. A different class of work, the rapid study of a special effect, is represented by such a sketch as "A Midland Meadow—Clearing for Frost" (7), a remarkable sketch, though one may think that the blue of the distant portion is a little too emphatic. Among others which have a marked character are "Heidelberg" (51) which by the way rather reminds one of Mr. Goodwin; "The Silvery River Somme" (63), as French in character as the next one, "Sussex Fields" (64), is English; this latter is one of the most original works in the room. "Dieppe Harbour" (93) is a fine piece of colour, and the collection generally is valuable as an illustration of the free sketching work of an accomplished landscape painter. In the same gallery are some examples of a new method of "oil drawings," as they are called, by Mr. Rupert Bunny.

The following is the artist's description of the process:—

"The method consists merely in painting a picture in oil colours upon a copper plate and taking off the impression upon plate paper. But in reality the difficulties arising out of the selection and mixing of fitting colours, and in painting upon a surface which in no way resembles in colour that upon which the painting will find itself, are by no means few, and have prevented others from embarking upon it save in monochrome. These difficulties are not lessened by the fact that retouching after printing is a very hazardous matter."

As this is not a reduplication process, it may be asked (as the author seems to have anticipated) wherein its value consists. The result has, as he says, certain qualities which are not to be found in either oil or water-colour painting; it is a new effect in *facture*; but it does not strike us as of very much value, and we should be disposed to say that the same time might be better employed in sketching in oils in the usual manner.

GREAT complaints are being made in Paris in regard to the spirit in which the repair of the

Palace of Fontainebleau is being carried out, as it appears that modern work is being substituted for ancient in some portions of the building, without any motive or excuse. The graceful portico of the Cour Ovale has been replaced by a blank wall in new stone, while the remains of the old portico—friezes, capitals, &c., considered too much worn to remain *in situ*, have been carefully rebuilt in front of the façade of the grotto in the Jardin des Pins. "Restorations" of this kind are unfortunately becoming only too frequent in Paris, and it is to be regretted that the Inspecting Architects of the "Monuments Historiques" Department have apparently either not sufficient authority or not sufficient energy to keep a check on these and other ill-advised freaks of the architects of the "Batiments Civils."

#### TRADITION AND MATERIAL IN ARCHITECTURE.\*

THAT material is essentially a part of architecture at once marks out that art from others, sculpture in nearest degree resembling it; but painting, music, and poetry are almost free of the practical limitations that the use of material implies. Architecture is not so ethereal an art as any of these; like these it appeals to the mind of man, but in addition it supplies a bodily want, and this is a dual service attempted by no other. The architect's cognate worker is the clothier whose service to man is the same in kind, differing in degree for use and beauty; architectural style is pretty much fashion writ large.

That mere mass of material should be of account at all in an artistic appreciation of architecture is repugnant to some, still the fact is unquestionable that bulk produces a sense of awe. The Parthenon is now surpassed in size by many a factory, yet even its influence in the expression of majesty was not a little owing to substantial size; in its day it was among the biggest of contemporary buildings. True art will recognise this common instinct, and will with least material give the sense of greatest extent. If it be argued that it is not possible to magnify appearances, then, negatively, an artistic aim will be to prevent the belittling that results when features are measured that by association have a certain magnitude attached to them—St. Peter's, for example.

I would direct attention to some of the materials used in building, with the object of showing that, though an essential constituent of architecture, material shares place with another influence, tradition, that is yet more powerful.

\* An abridgment by the author, Mr. Alexander McGibbon, of a paper read by him before the Perth Architectural Association, on Friday, November 4.

Mind has influenced matter to a greater degree than some are disposed to admit. If on the one hand we must differentiate architecture from sculpture and painting, by whose canons of criticism it is so often mistakenly judged, on the other hand we must avoid excess in our materialistic belief in the potency of materials recently or yet to be discovered and applied in buildings.

We may well surmise that at the beginning the materials of a country or locality strongly influenced its architecture; but it is not so easy to get direct evidence of the fact, and the day has passed for calm assumption of certainty as to the methods, not to say motives, of the men of old; to gratuitously assume, as not so long ago was the custom, that primeval man took Nature in the fields and woods as his tutor in columnar construction, is unwarranted. The resemblance between trunk and column all may see, but not everyone may settle how much is coincidence and how much conscious imitation.

However interesting ethnographically may be the study of man as cave-dweller or erector of tent and hut, for practical purposes we may date the beginning of architecture from when we see evidently that, coincidentally with provision for material wants, an elementary desire for beauty has been met in a traditional treatment, or style. The earliest of Greek and Indian remains that we have are far removed from the beginning of things architectural, and notwithstanding what evidence may yet come to light, it is hardly probable that we shall ever get much nearer the beginning; but rightly directed research may enable us to predicate with some measure of certainty as to what that beginning was. Though the earliest remains are of stone, they show forms that have such a resemblance to wood construction that from the masonic evidence alone we should be justified in affirming the fact, even without the confirmation of pottery, and painted and carved decoration. I do not suppose there can be any room for doubt that many features in Indian work are clearly imitative or reminiscent of wood construction; the trellis work of stone beams, the corner bracket from columns like a fork of a bough, mortises and tenons, &c. But it is equally clear that the Greek Order is also an immediate survival of previous timber construction? Many are of opinion that it is otherwise.—Viollet-le-Duc, in his lectures, for example—and maintain the Order to be specifically designed for stone. They bid us note that the Doric abacus is of a size not easy to get in wood; while the derivation of triglyph and mutule from ceiling beam and rafter respectively is negated by their appearance at the gable ends, where in their alleged prototype they could not have been. Even the shaft, they argue, does not appear to come at first hand from the tree trunk, for the further back we go the stumper they are and the least like trees; while it is noted that a square prism of stone is most naturally taken from the quarry with its four corners cut off, and these again chamfered give the sixteen-sided column of the earliest Greek type. All this notwithstanding, I think the Classic order does show a reminiscence of prehistoric wood construction. In the case of the abacus, the timber prototype has entirely been departed from, and it now shows the qualities proper to stone, but in other parts this influence of material on design is absent. Tradition has been more powerful than logical consistency, and wood forms are perpetuated in stone.

It is obvious that big stones are required for lintels; smaller will do for arches. So in Greece the abundance of Pentelic marble has permitted of, if it did not suggest, a trabeated style; but Egypt also employed the lintel, though with the greatest difficulty. She had to hew the hardest of granite and transport it long distances. Why, we wonder, did not the excellent bricks suffice for arches that would have proved hardly less enduring than the granite beam? And in the lintel an arch form has here and there been found, proving, apparently, that a religious sentiment led to the use of the material conceived to be most lasting, while an architectural motive, gratified at the expense of logical treatment, led to the arch form in a lintel. Let three thousand years pass, and in, perhaps, the oldest type of building we have in Scotland—the Round Tower at Brechin, for example—we have large masonry generally, and a large lintel with the arch cut out of it. Opinions may differ as to the origin of the prototype, but there the arch is a notable



instance of tradition being more influential than material. Early Romanesque work has generally larger sized masonry than Gothic, yet the same quarries were drawn upon at the different periods, hewing implements and mechanical means of transport all improved, but the later builders' inclination did not go out to Cyclopean work, when it might quite easily have been gratified. Hence, throughout the whole Mediaeval period in Britain I question if a stone has been built exceeding a couple of tons in weight. About Oxford I have noticed in places a soft stone in large sizes, but singularly enough the forms cut are plainly those traditionally in vogue when smaller stones were used. Late arch-labels in the same way generally keep the traditional section, but are cut out of larger stone than was the earlier practice; they have no joint, that is, at the extrados. We find Gothic at Mont St. Michel, and Classic at Aberdeen, both of granite, but it does not appear that in either case the material had anything to do with the choice of the style.

Vrought-iron in the form of tie-rods influenced the Gothic of Italy. Arches were desired springing from single columns at porches and elsewhere, but the thrust was met not by counteracting flying buttress or inertia of wall, but by tension of metal. This was a novel use of a material till then in construction neglected, but now legitimately, if not quite happily, turned to account, and one might have expected the new mode to have spread and become more general than it did; but after all it takes its place only as a useful aid, alike for arches and roofs. Gothic architecture was not revolutionised; the old methods have not been displaced; for one arch to be seen, even to-day, whose thrust is met by tension, a dozen are found sustained by either counter arch or buttress. The eye is apparently better pleased to have it so; old world practice is in its favour, hence the mode endures.

Cast-iron columns and rolled beams in our own day are developments that have undoubtedly influenced architecture. To believe some, indeed, one would think we are now quite emancipated from all past canons of art; but we note that, although most happily we have it in our power nowadays to do much that was hitherto impracticable, still, after all, a substantial proportion of the world's work is done in the old way. No disparagement to the new methods; for architects, whose conservative sympathies incline to stone construction, often best appreciate the existence of metal so used, and it is they, and not engineers, who should give all due regard to the novel material, and who regret to see it masked behind masonry—as, for example, at the Tower Bridge.

Lead is a material that as a covering might have influenced the Gothic roof, and so necessarily the gable—the characteristic Gothic feature, says Ruskin—in a way that it did not. If in Norman times lead was in small plates, in Gothic times, just when roofs were steepest, it was used in the form of strips and rolls. On a pitch of forty-five to sixty degrees slates and tiles hang well, but the "crawl" of lead is excessive; the material calls for a rake anywhere under thirty degrees; called, I may say in vain, for over a couple of centuries, until in the Perpendicular period this sensible pitch of roof was given; in this, as in some other things, the style showing a truthfulness to utilitarian principles and logical construction not met with in the perfected Gothic of France, so unweariedly eulogised for this very quality. Of course, I am not arguing that the pitch of roof ought to have been lowered to suit cast-lead; architecture overrides such fitness. I only cite as a historical fact that it was not, although the practical logic of the material pointed that way; traditional motive was superior to the material in influence, and Gothic as gloriously inconsistent as ever classic was.

Timber, I think, we might have expected to have influenced our Scottish buildings more than it has. Of suitable woods we have abundance, and the climate is not inimical. Statistics of the comparative rainfall in Lancashire and our west coast prove this; yet in Lancashire there are noble half-timber manor houses; with us none at all. Why is it that north of the Tweed we have not a single timber church porch, and a timber spire is rare, though these may have existed? Simply, we must believe, I think, that the timber-work did not appeal to the Scottish taste, though material in abundance was to be had, in spite of what Dr. Johnson was pleased to believe to the contrary.

Zinc and sheet-iron have been employed in America for cornices, a development on European practice (chiefly French) confined hitherto to large and elaborate hip rolls on roofs, mansard especially. This direct imitation of stone features is alarming, but perhaps only at first. A little reflection will reassure us; it is no new thing in the course of architectural development for an old form to be copied in a new material. We have seen wood copied in stone; stone imitated in sheet-iron is not more strange. As in the former case, it will be an affair of time, if ever, before detail is designed appropriate to the new material; but even with its nature and capabilities recognised there will remain a reminiscence of that other material from which it was derived. It is in the noting of such like derivations that much of the interest of archaeology consists.

Largely because of the use of a metal framework in buildings, terra-cotta has come into vogue. It is, of course, nothing more than brickwork of a superior kind, which, instead of being moulded into plain solid blocks, takes the form of pottery; solidity, if required, being given by concrete filled in when building. One obvious possibility about this material is that, coming from a mould, elaborate ornament can be repeated easily and inexpensively. We must, then, in judging it, use another standard than that applicable to carved stonework. Vermiculation and diaper laboriously cut by the mason often offend by vaulting labour of execution over design; but as turned out from a mould our criticism must alter, and we may welcome abundance of ornament that need not disturb the contour of features, and may give a texture of surface of almost as much value as colour itself. This, of course, should be our treatment of the material; but whether it gets it or whether it will be treated just as stone, time alone can show. It has been noted that in the modelling of terra-cotta, as raised ornament is applied by the fingers to a surface rather than left by cutting from it, as with stone, so the treatment should express itself in the case, say, of a panel, by the ornament projecting. This is, perhaps, carrying the principle to an extreme of nicety, for the material being plastic, the modeller can at will dig out or apply; but I think it very just that in stone cutting this truth in working should be more recognised, for it is always regrettable, as misapplied labour, to see small portions of raised work left at the expense of sinking a large surface.

Besides the inherent quality of materials that should condition their employment, there are others imposed by process of manufacture, such as size in bricks, or commercial usage, as the stock sizes of timber and stone, carrying with it variation in prices that cannot be disregarded. These extrinsic conditions may, to a slight extent, modify architecture, though, if motive is assertive enough, these will be overridden; but I can see no particular merit in disregarding such subordinate influences. In one of Dublin's cathedrals are to be seen, I believe, Purbeck shafts that, just as shipped across channel in stock lengths, are built, with bands at intervals, decided not by an architect's designs, but by quarrymen's practice. It is a trivial matter, but I do not think architecture in the grand sense suffers from it, and to those who know there is an added piquancy. We know that in our ordinary practice stones are delivered at a job of approximate fitness in size for the particular parts they are intended for, so there is considerable affectation in the studied excess of irregularity in door and window quoins sometimes seen; weak in construction, it disregards the workman's practice. It will give a craftsman's interest, without the architect's influence in any way being impaired, to let local practice assert itself in things immaterial.

Let this, then, suffice to answer the query, Has the architecture of the past been influenced most by material or tradition—the motive of its designer? Assuredly by the latter. And that said, are we prepared to go further and forecast in the future, say, which of these will be the potential influence in days to come? A question not strictly within the limits of a practical paper, yet not wholly idle; for as we realise the greatness of the future so shall we be inclined to see the dignity of the present, out of which that future must proceed. To me it seems that only in the experiences of the past have we any assurance for the future, and if we are inclined to think of the maxim, "The thing that hath been is that which shall be," as derogatory to

present day life and progress, let us reflect that the part of architecture is something very noble, of an antiquity greater far than that of music and painting, the popular arts of to-day. Hence our data, gathered from a wide source, permit of an augury that one might not attempt in these arts. "Forty centuries look down on us from the Pyramids," while music, which in much is analogous to architecture, and has been delighted in by man since its creation as an art with formulated canon, is of comparatively recent date. Seven centuries ago harmony as now understood was not, while the best of the musical instruments are the inventions of the last two. Landscape painting, with its developments of perspective aerial and linear, is of recent date. Sculpture resembles architecture, not only in mass, but in age; its principles and practice are as old as civilisation. The same may be said of poetry; so it is not to be wondered at that these, with architecture, fail to show the modern development that music and painting exhibit.

This antiquity, then, of architectural practice gives data for a forecast of its future. Of course, architecture has not been a thing of evolution and broadening precedent only. An intelligent review shows that besides logical advance, with increasing utilitarian needs and variety of materials there has never ceased to exist a sentimental influence, impalpable but potential, viz.: Traditional motive—which very often has expressed itself in tenacious retention of old forms for the sake of associations connected with them, material or religious. And hence have arisen all these delightful inconsistencies in the use of materials that we have discussed; the prejudices that influence a national choice of lintel or arch style, Classic or Gothic, that no one can suppose ever came about because of the architect class decreeing the superior merit of one or other, even had the architects themselves been quite beyond the influence of the current taste. And so architecture is seen to be a history of human progress written in stone. Surely national peculiarities are worth preserving, even provincialism in due measure; it is a spurious altruism that would replace these by a lifeless cosmopolitanism. Timber, as we have seen, is quite available in Scotland, but just because of the historical fact that heretofore it has not obtained favour, perhaps we do well to preserve the character of our architecture as we find it. We do not condemn half-timber work if we elect to use stone, for there is a difference between our retention of old forms and that of former times; this, namely, that our conservatism is self-conscious. Then it was that, knowing no other way and convinced that their father's methods were best, a traditional method was followed; while we, not even by implication, affirm that other forms are less worthy, where we retain those indigenous to our land, or specially associated with our race. Vandalism was the characteristic evidence of life in all previous periods; nowadays we rightly taboo that spirit, for we can exercise the right of liberty in choice of our models without destroying those we do not follow. Employing past forms and archaic materials does not imply that we are wilfully blind to the excellence of modern; it but indicates the cultivation of a sentiment that adds poetry to our too matter-of-fact day. Modern needs, comforts, and conveniences may be depended on to demand and get full attention, but a fostering care is required for the beauty that should accompany these, and this will often take the form of ingeniously preserving the historical continuity of traditional forms.

The phonetic power of architecture is very limited; beyond the expression of majesty, richness, and beauty, I know of none a building is capable of. The first is effected by actual bulk, the second by repetition of parts, the third by refinement of form. Beyond these it is by association of ideas merely that certain styles are popularly apportioned to certain types of building, to the church, the theatre, the town hall, the family dwelling, &c.

Now, these three emotions are excited independently of particular materials. Thus, much of the Italian Renaissance is of brick covered with stucco, simulating stone construction; and, regret as we may the unsubstantiality of the meaner materials, the architectural form is there and gives us pleasure; that pleasure would, of course, be heightened by the presence of the real rather than the make-believe. Still, intellectually, it is better to have, say, Palladio in stucco than not at all. Whether granite or stucco, in mass there is produced an emotion of



awe. Repetition of parts expresses richness; its equivalent in poetry is rhyme. That may be allied with doggerel, but is none the less a component part of noblest verse. So in a structure the repeated feature may be poor, though not necessarily, but simply because with its repetition a sense of richness results. This principle is best exemplified in Indian work, but a colonnade or arcade are cases in point; and to come to details, note the dentil course in a cornice or a balustrade. Of the Greek triglyph, you remember Ruskin has asked if any one ever found pleasure in it; but even if unlovely in itself, repeated, it fulfils a purpose. Repetition of parts and symmetry are methods by which an architectural effect is produced, and that quite irrespective of materials. And clearly, abstract beauty of form is in no degree dependent on material.

So we may confidently predict of all coming architecture that whatever be the material employed, not merely the principles of the past, but as these were practised—the actual form—will be retained. Novel materials may emerge, but in the main the old will be preferred. There will be cycles of fashion in revivals of past styles, but withal there will result an accretion of real worth, so that it will not be possible for future cognoscenti to be misled in distinguishing the chronology of these successive revivals, for each will have acquired insensibly a character peculiarly its own. Colour indeed may perhaps be more considered than it has been, for chemistry or commerce may bring to us coloured material hitherto denied us; but this will never revolutionise architecture. The best correction of the mistaken notion that the coming years will see new materials, and hence a new architecture, is a reference to history; can any one conceive of greater social changes than the past has shown, or wider variety in material than timber, stone, metal, and slate?

Many are concerned about the perpetuation of architecture as a living art: they look forward in dismay to an unending reproduction of past styles, and fearing that antiquarianism will only cramp design, they recommend the architect to study Nature, their hope being that acquaintance with natural forms, especially the human figure, will somehow help in the designing of the purely artificial forms of which architecture is alone composed. Now, it seems to me the clear lesson of history that function has modified architecture but little, material still less, and Nature, in this sense, not at all. As a practical corollary, I consider an architect's drawing from the life for specific inspiration in design as futile; it is a form of culture, doubtless, to be commended to all men of whatever occupation, but positively mischievous if it leads the architect to confound the essentially imitative arts of painting and sculpture with architecture, which is essentially creative. To train eye and hand in perception and delineating of beautiful line study of the antique is good, but architecture is a thing of artificial forms, empirically approved of by the same mental capacity as that which in the art of poetry has arbitrarily formulated the rules that govern the construction of the sonnet. If we do not acquaint ourselves with the endless variety that the past shows, but go on to original work, we shall most likely laboriously attain to something that was old long ago, earlier acquaintance with which might have permitted of our improving on the type. If we suit modern requirements, using modern materials, but conserving and perpetuating old-world forms, unconsciously there will emerge such variety as will quite worthily distinguish our work from that of all previous times.

A. MCGIBBON.

#### COMPETITIONS.

**SWIMMING BATHS, GOOLE.**—The Goole School Board have awarded the first premium for competitive plans for swimming baths to Mr. Tennant, architect, of Pontefract. The baths are to be erected at Alexandra-street Schools. The second premium was awarded to Mr. H. B. Thorp, architect, Goole.

**LEYTON PUBLIC BATHS COMPETITION.**—Mr. Rowland Plumbe, the assessor appointed by the District Council, has given his award as follows:—1st. "Economy," No. 2 (Messrs. Harrap & Duffield, 34, Queen-street, E.C.). 2nd. "Economy," No. 1 (Mr. J. Williams Dunford, 100c, Queen Victoria-street, E.C.). 3rd. "Q.E.D." (Messrs. Gordon, Lowther, & Gunton, Finsbury House, Blomfield-street, E.C.). The competition was limited to these

competitors. In concluding his report Mr. Plumbe says "that all the competing architects thoroughly deserve the thanks of the Council for the painstaking, skilful, and intelligent way in which they have responded to the invitation to compete." The cost of the buildings will be 15,000l.

**COLSTON HALL, BRISTOL.**—Mr. H. L. Florence, Vice-President of the Royal Institute of British Architects, has been appointed assessor in the competition for the new Colston Hall.

#### THE SURVEYORS' INSTITUTION:

PRESIDENT'S ADDRESS.

THE opening meeting of this Institution for session 1898-99, was held on Monday evening, in the temporary premises of the Institution, Savoy-street, Victoria Embankment, when the President, Mr. Robert Vigers, delivered an opening address.

In the course of his remarks, the President said it was a wise policy of those who founded the Institution to establish it on the broadest possible basis, so as to make it representative of every branch of their manifold calling. How varied was the professional field which they covered was shown by even a cursory examination of the list of members, which now, he was proud to say, comprised nearly 3,000 names. It was easy to appreciate, though not perhaps very easy to define, the common bonds which united them in the ties of membership, and he had come to the conclusion that there was no better definition conceivable than that contained in their by-laws, viz.: "The art of determining the value of all descriptions of landed and house property, and of the various interests therein; the practice of managing and developing estates, the science of measuring and delineating the physical features of the earth, and of measuring and estimating artificer's work," unless he might add "the art of obtaining fees adequate to the remuneration of services so rendered." He supposed that he personally represented almost the smallest section of the membership—those who practised as surveyors only; and under these circumstances he would confine his observations generally to matters connected with this great metropolis, which presented such an immense and unique field for professional activity. The material growth of London during the fifty years covered by his personal experience almost transcended belief. A comparison of a map of London in the forties with a map of our present London would show how rapid and complete had been the absorption of the open spaces which separated it at the earlier period from the surrounding hamlets and villages—spaces which had been taken possession of in the interval by the extra two millions of persons for whom house accommodation had had to be provided. He took by way of example the parish of Kensington. The population of the parish was in 1856 54,000 persons, in 1896 it had risen to 170,000 persons—in other words it had more than tripled. In 1856 the inhabited houses numbered 6,300, in 1896 22,580, or three and a half times as many as forty years previously. The roads under the control of the vestry measured twenty-seven miles at the earlier date; in 1896 they measured eighty-five miles. The rateable value was 287,655l. in 1856, and had risen to 2,200,000l. in 1896.

The President then referred to the wider area known as the administrative county of London, which, subject to a slight correction, was co-extensive with the old Metropolitan Board of Works district as defined by the Act 18 and 19 Victoria, cap. 120. The population of the area now known as the administrative county of London, comprising 75,422 acres, was in 1851, 2,363,274; 1861, 2,808,862; 1871, 3,266,087; 1881, 3,834,194; 1891, 4,232,118; or putting it another way, about fifty-six persons to the acre. In the decade 1851-61 the population increased by 445,588 persons, or 18·85 per cent.; in the decade 1861-71 by 438,125 persons, or 16·31 per cent.; in the decade 1871-81 by 567,207 persons, or 17·36 per cent.; and in the decade 1881-91 by 397,924 persons, or 10·37 per cent. The number of inhabited houses was, in 1851, 306,064; 1861, 360,065; 1871, 419,642; 1881, 488,885; 1891, 548,315. An inhabited house was, for census purposes, a house or tenement in which one or more persons slept on the night of enumeration. It was a fact worth observing that while the ratio of the growth of the population showed in the first

three decennial periods a tendency to exceed the ratio of increase in the number of houses in the last census decade, the growth of house accommodation exceeded the growth of population by about 2 per cent., and he thought he was entitled to argue from this that the work done during the last twenty years in the demolition of overcrowded slum neighbourhoods was beginning to bear fruit, and to reveal itself in our statistics. The number of persons per house had fallen 0·30 per cent. in the last two decennial periods (the figure was now about 7·64 persons per house compared with 7·94 in 1871), and his point was: that not only had the number per house fallen appreciably in the last twenty years (despite an increase of nearly two millions in the population), but that in an enormous number of cases the 7·64 persons per house were now living in far larger and healthier dwellings than the 7·94 persons per house of twenty years ago, and that, with improved dwellings, 7·64 persons per house was not by any means excessive.

He was not very conversant with the work done under the Housing of the Working Classes Act, but it was stated that the valuable sites for rehousing on the route of the Strand to Holborn improvement would involve a loss to the County Council of 260l. per person provided for, or for a family of seven persons an unremunerative expenditure of 1,820l. for land only, if reinstated close to their former dwellings. This was in startling contrast to the experience of the Peabody trustees; but then the philanthropy of the trustees was not of so exalted an order as to induce them to select sites in expensive situations for the mere purpose of saving the persons to be benefited a quarter of an hour's journey to their work. There was the less necessity for this plan of rebuilding on the old sites, seeing the facilities in the way of cheap workmen's trains for rehousing the displaced persons in the far healthier atmosphere of the suburbs. Indeed this system of workmen's trains was in some danger of abuse, and of becoming a check to enterprise. There could be no doubt that the conditions in this respect imposed on the new railway beneath Oxford-street were oppressive in the highest degree, whatever might be their justification from the point of view of modern sociology.

In referring to the Peabody buildings the President said that it was a significant circumstance that, notwithstanding that the number of persons in those buildings represented a mean density nearly thirteen times as great as that of London as a whole, the death rate was 2·8 per thousand below the average of London, while the infant mortality (the most telling factor in the death rate), was actually 2·9 below that of London as a whole. A serious problem was how to provide a population increasing at the rate of about half a million in ten years with those means of internal communication necessary for the free movement of the vast traffic traversing the restricted area comprising the principal centres of business activity. Speaking broadly, it might be said that the bulk of the heavy commercial traffic of London (taking the area lying between Westminster and the Tower) was between north and south, that was between the termini of the great railways on each side of the river, the port of London, and the warehouses and manufactories of Southwark and Bermondsey. The opening up of new routes for vehicular traffic had done a good deal to relieve the pressure, and the effect was strikingly displayed in the case of the Tower Bridge. The lighter traffic and the ebb and flow of the pedestrian tide was, on the other hand, mainly from east to west. Every one must have been struck with the crowded condition of the footways along the main thoroughfares during the greater part of the day. A man who sought points as Liverpool-street and St. Paul's, Moorgate-street and the Mansion House, or the bottom of Fleet-street and Charing-cross, found his progress checked and at times absolutely arrested by the double stream of people on the narrow pavements he had to traverse, where the pace was set by the slowest walkers, who were frequently mere loiterers or sightseers. It must have occurred to him to wonder what the state of things would be in this respect in twenty or thirty years' time. Yet practically no attempt had been made to mitigate this great and growing inconvenience. There was no lack of schemes for widening the roadways, but, so far as he was aware, the equally serious consideration of facilitating the progress of the pedestrians by the



provision of wider pavements had, except in a few instances, not been deemed worthy of attention. It was not sufficient to widen a street like the Strand from 53 to 80 ft., as indicated by the setting back at the corner of Wellington-street, unless the footways were also doubled in width, nor did it meet the case to provide parallel thoroughfares, for people would not quit the direct track from point to point, whatever the inconvenience might be of attempting to traverse it. The system of tube railways, now in its infancy, would probably absorb in time some of the foot traffic of the main thoroughfares, and might even result in a temporary diminution in the number of omnibuses, but the limits of the carrying capacity of these railways must soon be reached, and the provision of wider roads and pavements and new arteries for wheeled traffic would become imperative. He was of opinion that the time was not far distant when the people of London would be called upon to incur an enormous expenditure in further widening streets like Oxford-street, Holborn, the Strand, Fleet-street, and Ludgate Hill, originally laid out for a population one-tenth the present size; for what had hitherto been done in this direction was a mere tinkering with the problem of free locomotion.

The remarkable growth in the value of City property in the latter half of the present century was a matter of common knowledge to them all, and it was difficult to see when the limit of expansion in this direction would be reached. One of the contributory causes was the constantly expanding day population of the City. But there had also been another though a less obvious cause operating in the same direction—he referred to the absorption, continually in progress, of building land for the purposes of public undertakings, street widenings, and other improvements of the kind, all of which tended towards reducing the available area of building land. Before leaving the subject of City property, he would give some figures bearing on the question of prices in connexion with a purchase in Lombard-street in which he was concerned. The land in question comprised 1,080 superficial feet. It was originally purchased by the grandfather of the vendors for 1,500*l.*, or 1*l.* 7*s.* 9*d.* per foot super, and was sold to his (the President's) clients for 73,000*l.*, or 71*l.* 11*s.* per foot, which at 4 per cent. would represent a rental of 2,920*l.* a year. That was in remarkable contrast to the value of land in the same neighbourhood which their Past-President, Mr. I'Anson, mentioned in his paper read before the Institution nearly twenty-eight years ago, as having been sold for something like 40*l.* per foot, which he then regarded as an altogether exceptional price. He had spoken of the influence on prices in the City of London, of the abstraction of land from the available building area for the purposes of public improvement, but this influence was also at work, though in a less noticeable degree, in the much larger area formerly under the Metropolitan Board of Works, and now under the control of their successors, the London County Council. He was indebted to Mr. Percy J. Edwards for some instructive figures taken from a report prepared by him; this return comprised a list of thirty new streets and street widenings effected between 1857 and 1885 inclusive, with their gross and net cost and the approximate area of building land absorbed in their execution, from which it would be seen that the area of building land lost to the market was 1,666,650 feet super, or nearly 37 acres.

The President then dealt with the subject of sewage disposal, and referred to Mr. Cameron's septictank system and the "Electrozone Sterilising Process," carried on at Maidenhead. Proceeding, he said that at the annual meeting he took occasion to address a few words of advice to the younger members of the Institution, which he trusted and believed were taken in the kindly spirit in which they were conceived. In every profession there was a small minority of persons who were in such haste to get business and extend their professional connexion, that they were not over-fastidious as to the means they employed for achieving the end in view. Some of these persons (such as their eagerness) openly advertise and tout for the business which did not come to them as the natural reward of skill and knowledge, while some, even less to be admired, strove in various specious ways to discover and appropriate the connexions of others. Now, it was the first duty of members of an honourable pro-

fession to do everything in their power to discourage and defeat these practices. Offences of the kind were generally (not always) committed by young men who, as often as not, erred through ignorance. To these he would say that a stable business was rarely, if ever, built on such foundations, and even in the few exceptional cases where this occurred the result was achieved at an immense sacrifice of reputation and of that self-respect which goes so far to brace and encourage a man in the troubles and vicissitudes of life. He was thankful to say that a case very rarely arose of a character so flagrant as to call for direct animadversion; but he, for one, should rejoice if their profession were entirely free from reproach in this particular.

While dealing with the ethics of practice he should like to say a few words with reference to the subject of expert evidence on oath, for he had lately observed some very foolish and unjust things which had been said by half-instructed persons, with reference to the divergences between valuations put forward in connexion with compensation cases. He was free to admit that there was an occasional extravagance of the kind in one direction or another; though, as a matter of fact, it frequently happened that the difference between the extreme valuations on the same side was just as great as between the extreme valuations on the two sides. He would not, however, admit for a moment that the surveyor was one whit less scrupulous, in the opinions he expressed, than the members of other professions liable to be called upon to give evidence on matters of opinion, and, consequently, open to amateur criticism. He supposed that every man had his "personal equation"—his unconscious bias in a particular direction. Next, it must be remembered that the art of valuing was not an exact science, and would never be made so. It rested not only on fact but on opinion also, and, what was more, on opinion founded to a large extent upon varying personal experience and an estimate of probabilities and contingencies, which might or might not arise but which, if they did arise, largely influenced the result. Were the elements on which a valuation was based demonstrable with mathematical accuracy, the whole affair would be one of tables, and the services of the expert witness would be totally unnecessary. So long, however, as the value of property remained a matter of opinion and speculation, divergences must arise. What was the position of the surveyor as a witness on oath? He had sworn to tell "the truth, the whole truth, and nothing but the truth." Now as this adjuration was much too precise and comprehensive for application to matters into which purely speculative opinion must, from the nature of things, largely enter, it followed that what in effect the witness swears was not, that all he had to say was fact, but that what he had to say was his honest opinion. It was a question whether the examination of expert witnesses on oath was not a mistaken endeavour to apply to the region of opinion a procedure imported from the Courts of Law, and entertaining in principle to the region of pure fact. Might it not be contended, with some show of reason, that the position in which the surveyor should really be placed was that of a technical advocate for his side, a species of assessor to counsel, and that it should be left to a sworn umpire to settle, after hearing the witnesses on both sides, the degree to which the more speculative elements in the valuations should be allowed to prevail?

In reference to the Institution itself, the retrospect of the last thirty years should inspire them with a pardonable pride. No institution with which he was acquainted had ever achieved such a remarkable success in so brief a period of time, and, so far as it could be ascribed to any one circumstance, he thought this had been due to the habits of caution, so characteristic of surveyors, which had governed their procedure. It had been the policy of the Council, while availing themselves of every real opportunity of advancing the interests of the profession, to avoid that fussiness which some persons considered the first duty of a professional society. They had not sought to harry public departments on small pretences or on none at all, and, as a consequence, when they had approached them on questions of moment they had received attention and consideration at their hands, and had been able to usefully influence in this way the course of legislation and the tendency of Departmental procedure. In the result the

Society was stronger to day than at any period of its history, and whether regard be had to numbers, to financial position, to internal organisation, to the freedom of its constitution, or to the beautiful new home which it had provided for itself, and which would be completed early next year, it might challenge comparison with any other professional body in the kingdom. But the future was with the rising generation, not with that which was passing from the scene. The younger men could not say that they were not entering into a goodly heritage, and it rested with them to decide whether they would dissipate and destroy it by indifference or even by mistaken activity, or whether they would hand it on unimpaired, and even extended, to their successors.

Mr. Howard Martin proposed a vote of thanks to the President for his interesting and valuable paper—valuable, because it was drawn from a singularly long and varied experience in the profession. In dealing with the difficulty of traffic the President had not referred to motor-cars, which might tend to diminish the pressure of vehicular traffic, because such vehicles occupied less room than horsed cars.

Mr. Freeman, Q.C., seconded the motion, which was heartily agreed to.

It was announced that the next meeting will be held on the 28th inst., when the discussion would be resumed on Mr. Eve's paper on "Compensation Values of Cattle Foods—Chemist v. Valuer."

The meeting then terminated.

#### ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—On the 12th inst. a party of the members of this Institution, numbering over 120, visited the site of the Lombard-street Station of the northern extension of the City and South London Railway. On behalf of the engineers, Sir Benjamin Baker and Mr. David Hay, they were received and shown over by the resident engineer, Mr. James Forgie, and the representatives of the contractors, Messrs. Mowlem & Co. The feature which naturally attracted the greatest interest was the work connected with the underpinning of St. Mary Woolnoth Church, immediately underneath which the main shaft for the lifts has been sunk. The company by an Act of 1893 had power to pull the church down, but when in 1896 an extension of time was sought, the condition was imposed that the church was to be left intact, but that the subsoil could be used and the station constructed beneath the church. The large oblong shaft is 73 ft. 6 in. by 24 ft., divided into five bays, in which will work electric lifts made by Messrs. Easton, Anderson, & Goolden. It is lined with cast-iron segments for a depth of 52 ft. from the top, the remaining 28 ft. being brickwork, in which are formed the entrances and exits to and from the lifts. The two station tunnels are 21 ft. diameter and lined as usual with cast-iron rings. In underpinning the church, the four main girders designed to support the four groups of columns which carry the roof, were fixed in position, and small needle girders were then threaded through the bases of the columns. The south wall was pierced at intervals of about 5 ft., and strong needle girders fixed through the wall, one end resting on the solid stone on the outside, and the other tied down to one of the main girders supporting the columns. For the wall on the north side the same method could not be adopted, as the work could not be executed from the street. One main girder was therefore designed to carry the whole weight. Needle girders were fixed just below the church floor level, under cover of which the wall was cut away to allow of the girder being fixed. After the wall had been securely pinned up above the girder, suspended needles were put in one at a time, and the intervening masonry held up by cross steel joists placed on the top of the needles. GROUTING under air pressure had been largely employed in the work, especially for filling up between the girders and the old masonry, and the success of the operation has been in a great measure due to this. At the conclusion of the inspection the thanks of the Institution for all that had been arranged for the members' reception were expressed by Mr. Kenneth Gray, Vice-Chairman.

THE INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution on Tuesday, Mr. W. H. Preece, C.B., F.R.S., President, in the chair, the paper read was on "Electrical Transmission of Power in Mining," by Mr. W. B. Esson, M.Inst.C.E.



### Illustrations.

THE lithographic illustrations in this issue are entirely devoted to the architecture of Belfast, and are referred to in the leading article in this issue, being the nineteenth of the series on "The Architecture of our large Provincial Towns."

The illustrations comprise the following:—  
On the first sheet:—"Entrance to the Harbour Office" (Mr. W. H. Lynn, R.H.A.), "Business Premises, Arthur-street" (Mr. Vincent Craig), and "Belfast Academy" (Messrs. Young & Mackenzie).

On the second sheet:—"Queen's College" (the late Sir Charles Lanyon), the "Northern Bank" (same architect), and the "Presbyterian Theological College" (the late Sir Charles Lanyon, with additions by Mr. John Lanyon).

On the third sheet:—"Campbell College, four illustrations (Mr. W. H. Lynn, R.H.A.), "Business Premises, Donegall-square" (Messrs. Lanyon, Lynn, & Lanyon), and "The Old Poorhouse," now the headquarters of the Belfast Charitable Society, and which is one of the few old buildings of any interest in Belfast.

On the fourth sheet:—"St. James's Episcopal Church" (Messrs. Lanyon, Lynn, & Lanyon), "Sinclair Seamen's Church" (Mr. W. H. Lynn, R.H.A.), "Evangelical Union Church" (Messrs. Young & Mackenzie), "Carlisle Memorial Church" (Mr. W. H. Lynn, R.H.A.), "Newtownbreda Presbyterian Church" (Mr. Vincent Craig), and "Bloomfield Presbyterian Church" (Messrs. J. J. Philips & Son).

On the fifth sheet:—"New Buildings for the Scottish Provident Institution" (Messrs. Young & Mackenzie), "Northern Branch Bank, Royal Avenue" (Mr. J. Lanyon), and "The Mater Infirmorum Hospital" (Mr. W. J. Fennell).

Some other buildings are illustrated in the cuts attached to the article.

### THE ARCHITECTURAL ASSOCIATION: ARTS AND CRAFTS.

AN ordinary fortnightly meeting of this Association was held on Friday last week in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. G. H. Fellowes Prynne, President, in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected as members:—A. E. Bell, W. L. Binney, H. P. Buckingham, H. M. Cantley, H. I. Candy, A. C. Stewart, S. M. Deacon, H. Dru. Drury, H. L. Etherington-Smith, R. Findon, C. R. B. Godman, J. H. Mellish, E. Y. Mitchell, J. A. Payne, H. T. A. Peacey, J. B. Royle, H. V. Shebbare, C. O. Spencer-Smith, A. Syman, J. N. R. Vining, A. P. L. Wood, H. Worrow, F. F. Lemaistre, T. S. Vickery, H. E. Brown, and W. J. Stainton.

The Chairman then put to the meeting the names of Messrs. Alfred H. Hart and H. A. Satchell, who were nominated at the last meeting to serve on the committee. These gentlemen having been elected,

Mr. H. Wilson read the following paper on "Arts and Crafts":—

There are certain phrases containing more or less microscopic portions of truth which only pass muster in those expansive thumb-in-armhole after-dinner moments when buttered aphorisms, like conventional oysters, slip from cloudy heights down the epigastric slopes into the clear champagne.

Among these abraded epigrams is this—Architecture is the mother of the arts—a dictum doubtless begotten by some wit with a bowing acquaintance with architecture and a refreshing innocence of art. It is one of those worn counters from an obsolete mint which keep real currency out of circulation, or, to change the image, it is a mental *cul-de-sac*, the result of what psychologists call "mental arrest." The aphorism renders real investigation difficult by acting as a stumbling-block. That said, we are tempted to think that there is nothing more to say. But immediately the stumbling-block is turned over we find that it hides the entrance to a new world of inquiry, and opens out new views of art and craft and architecture. We begin to see that architecture is not the mother of the arts, for they existed thousands of years before she was born—we find that the arts and crafts are the ancestors of architecture,

and that even now architecture is born from their conjunction, and does not give birth to them. The question has been obscured by much discussion, and so many false ideas have been imported into it, that the right conception has been overlain by misconception, and suffocated.

But if we go back to the beginnings of things, penetrate as far as we can reach into prehistoric origins, we learn at once that the art of personal adornment and the craft of tool-making come first in the evidences of human activity. The art of using tools is acquired in the making of them—the stone-weighted stick becomes a hammer—the splintered hammer becomes the axe.

From splitting skulls to splitting wood the transition was easy and natural. Besides the more immediately insistent needs of protection, shelter, and the satisfying of hunger, there arose in the very earliest times that other need of self-expression. Full of wonder at the mysteries with which they were surrounded on every side—the dawn and the darkness, the gloom and hidden terrors of the forests, the strange creatures by whom the earth was inhabited, the dangers real and imaginary in field and flood—the minds of our half-dumb ancestors were crowded with conceptions seeking birth. This birth they found in what we call art. They eked out their stammering utterance, their gesture speech, with rude-cut symbols. They spoke to each other in their work, and one feels that a rudimentary if you like, but still art—was the first real speech of mind to mind; and, whether that speech took the form of decoration of weapon or bowl or person, it supplied an outlet for nervous pressure, and the labour of making relieved their minds from the obsessions of crowds of new ideas, new impressions, engendered by the beauties of the outside world. Not only did the making of things for use or ornament give an outlet for new ideas in the making of the humblest article of use; the savage by unconscious symbolism built up for himself a kind of religion. We find the Pueblo Indians, who worship water as the principle of life—to whom a vessel, because it holds water, is sacred—express their belief on their pottery in a very remarkable way. The inclosing lines, the circling bands of ornament, on their bowls and vessels are never joined, but a space is carefully left open in such band. The women, who are the potters, say this is to leave a door for the life spirit. In their words, it is a departure trail for life or being.

When a woman has made and painted a vessel, she will tell you with an air of relief that it is a "made being," and, as she places it in the kiln, places food in the vessel and beside it. The noise made by the pot when struck or when simmering is the voice of the included being; the clang of it when the vessel breaks or cracks is the cry of the spirit escaping.

This being never cries out unprovoked, but is supposed to acquire the power of doing so by imitation, and no one whistles, sings, or makes any noise during the process of manufacture lest the being should imitate the noise, and by doing so crack the vessel and come out. Here we have art and craft as the early exponent and material source of early religions. In the South Seas we find that even the stone axe, from its associations with its maker, becomes first the symbol of the ancestor and later the object of worship. The handles of these sacred axes are carved by the "sacred men," who, during the whole process, chant songs and prayers to the gods that they may further the work and inspire the craftsman. Thus, as all the world over, the arts and crafts beget the first beginnings of expressed religion, and lay the humble foundation of the faith which made man "raise the soaring spires and sing his soul in stone." Out of arts and crafts all human achievement has sprung.

For we must remember that at this early period each man was an artist because he did not concern himself with art, just as children do and say and think beautiful things naturally; only when we teach them do they become affected and artificial. And all that our ancestor thought of was the suitability of the thing he was making to the use for which it was designed. The decoration of it was a natural instinct, as those of sleeping or eating. Impelled by that unconscious passion for creation, as by a spiritual procreancy, the dimly-comprehended beauties of the scene around him impinging on his perceptions stimulated his conception—pushed him out of himself into his work. His hut, with its con-

tents, was a little exhibition of the arts and crafts in embryo. We are looking at the remains of the first beginnings of architecture in the lap of time. Our ancestors were the primary craftsmen, and this art expressed his nature, gave form to his spirit, as the plant expresses the principle of growth—the life within the seed.

Nor was this all. The offspring of this primitive artist would naturally imitate their parent. Besides the inherited aptitude, besides his precept, they would have the continual stimulus of his example to urge them on to other efforts on similar lines, and thus early arose families of craftsmen—with nascent traditions and methods of work. When the scattered families gathered into tribes and built their palisades, they joined themselves into families of craftsmen and formed the rudiments of a guild, a society within a society, a centre of social activity inside the new society.

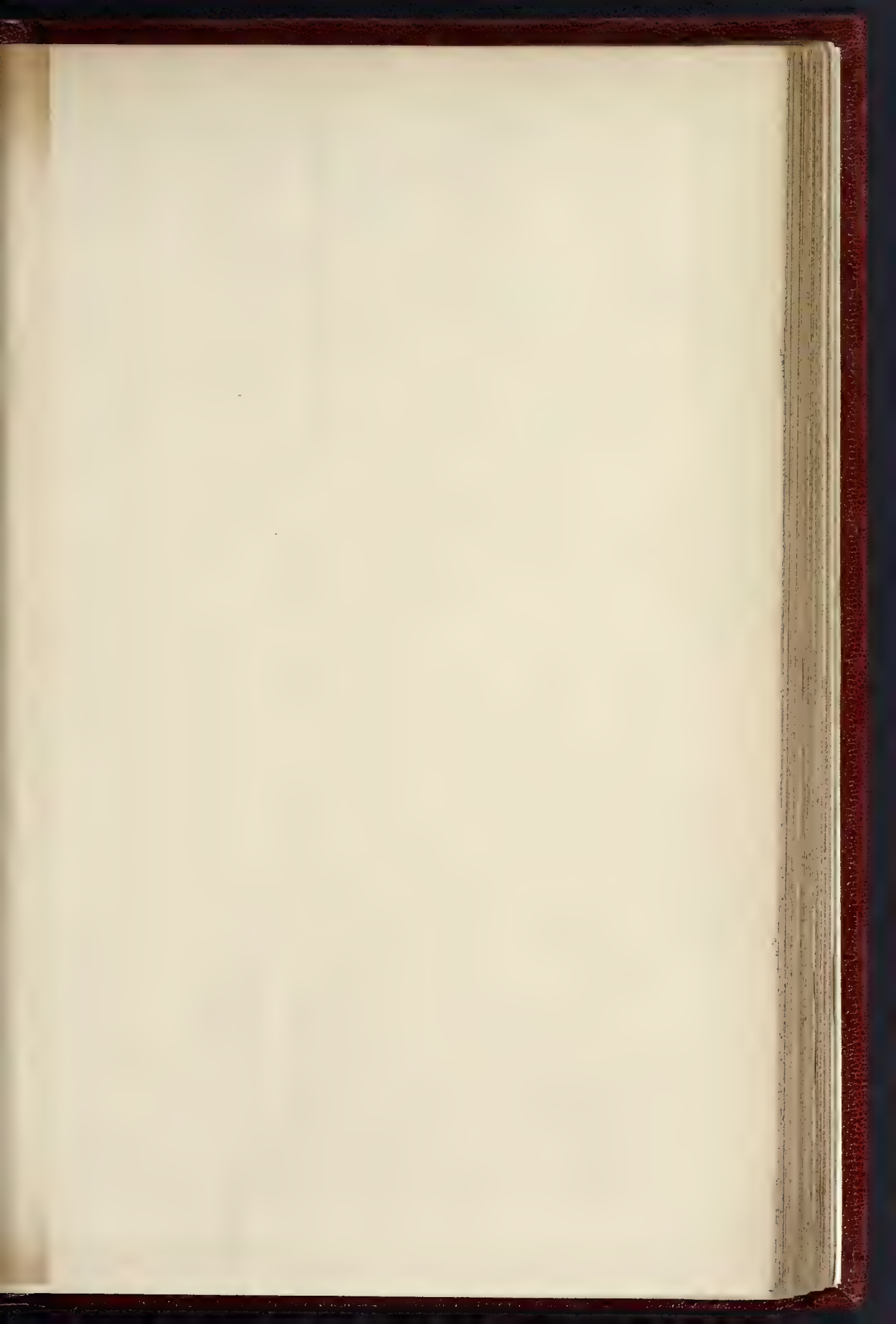
Each member of the family worked out in his own craft the budding ideas of early symbolism, doing nothing without a definite object, more influenced by the wonder of the world around him than impelled by a conscious ideal of beauty. The character of his work was at first governed absolutely by the nature of the materials at hand, so that he found lines of beauty in the fracture planes of flint. Then by elaborating the rude notches in the weapon haft he produced the intricate patterns on his paddle, or he evolved bands of ornament from the marks made by the cords, or the wicker-work moulds which bound together his first rude efforts at pottery. He was taught by difficulty and inspired by Nature. His mind grew as the plant grows, and his art was the fruit—the spore from which, under other conditions, a higher growth was to spring. When in the course of centuries the congress of the families of craftsmen gave birth to the guilds, their power came not merely from the infinite slowness of their growth, but also from the infinite ramifications of the roots which each individual fibre of that organism sent back through each item of its ancestry into the remote past.

The guild became the wide-spreading tree rooted in society, under whose branches every human being sheltered. It was as much the natural product of evolution as the family or the human being—like the human being also it found its completest development late in history. The hereditary craftsman existed, worked, and trained his offspring long before city life attained any high development; but when that development took place, and corporate life sprang from the associated lives, then the formative idea, the soul of the society and its governing power, centred itself in the guild.

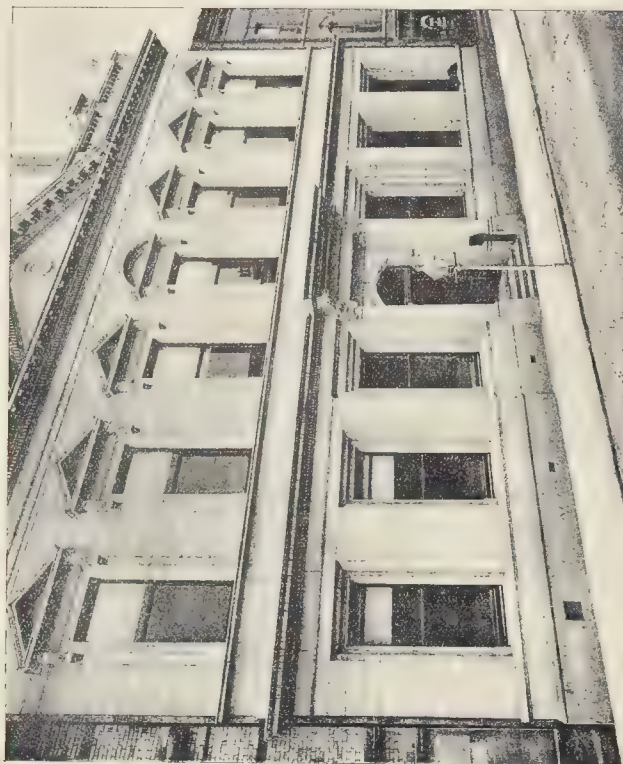
And when I say that the guild only came into corporate organised existence late in history, it is only late in relation to the time taken in the evolution of society, for in Egypt in some of the earliest monuments we find that the brotherhood of masons had existed long enough even then to become mythical; we find mention of the heavenly architect, Ptah, who, in conjunction with the chief of the brotherhood of masons, founded the temple of the heavens on the abyss of the waters. The master builder as prince, priest, and creator, is thus bound up with the origins of the religion, the shrines of which in later times his descendants were to build.

Coming down to more historic times, we find that in the development of crafts from family industries to trade guilds, it early became a law that each man shall train his family in his own trade. In far-off Peru, in earliest Egypt and in India, this custom prevailed. It was the same all through Europe. In the Institutes of Theodosius, a Roman youth was compelled to follow the employment of his father, and the suitor who sought the hand of the daughter could only obtain the bride by becoming wedded to the calling of her family. So in mediæval France crafts were inherited, and also in England. Thus the branching of the family through generations into a number of kindred families, carrying on the same occupation, produced the germ of the guild and formed a distinct cluster in towns. In process of time came apprenticeship into the family circle to learn the trade. By-and-by, with increase of trade, the master develops into the trader, and the workman into the citizen. Thus the craft guild is the typical form of the institution. As Lambert says, when the townsmen of Stratford-on-Avon were required in the year 1381 to make a return to





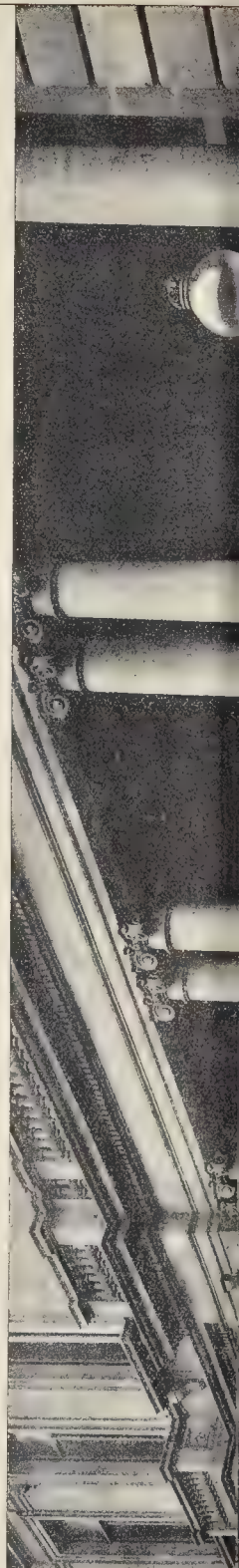
THE BUILDER, NOVEMBER 19, 1898.



BUSINESS PREMISES, ARTHUR STREET (M. VINCENT CRAIG)



BELFAST ACADEMY (MPSSES, YOUNG & MARENZIE)







PRINCIPAL ENTRANCE TO THE HARBOUR OFFICES (MR W H LASS, R.H.A.)

NO. 1007. STRONG & CO. 1885. MADE IN SCOTLAND. PAUL & CO.

BELFAST ARCHITECTURE













CAMPBELL COLLEGE. PRINCIPAL ENTRANCE (MR. W. H. LYNN, R.H.A.)



CAMPBELL COLLEGE BACK VIEW (MR. W. H. LYNN, R.H.A.)



CAMPBELL COLLEGE APPROACH (MR. W. H. LYNN, R.H.A.)



CAMPBELL COLLEGE (MR. W. H. LYNN, R.H.A.)



BUSINESS PREMISES, DONEGALL SQUARE (MESSRS. LANTON, LYNN & LANTON)



BELFAST CHARITABLE SOCIETY







ST JAMES EPISCOPALIAN CHURCH (MESSRS LAYTON, LYNN & LAYTON)



SINCLAIR SEAMEN'S CHURCH (MR. W. H. LYNN, R.H.A.)



EVANGELICAL UNION CHURCH (MESSRS YOUNG & MACKENZIE)



CARLISLE MEMORIAL CHURCH (MR. W. H. LYNN, R.H.A.)



NEWTOWNBRED A PRESBYTERIAN CHURCH (MR. VINCENT CRAIG)



BLOOMFIELD PRESBYTERIAN CHURCH (MESSRS J. J. PHILLIPS & SON)

MR. PHOTO SPRAGUE & CO. 4 & 6 EAST HARDING STREET, FETTER LANE, E.C.







NEW BUILDINGS FOR THE SCOTTISH PROVIDENT INSTITUTION. MENNERS YOUNG & MACKENZIE



NORTHERN BANK, NOVA AVENUE. MR. J. L. LAMONT



THE MATER INFERMORUM HOSPITAL. MR. W. PENNE

PHOTO. BY SPENCER & CO. FOR THE ARCHT. & ENG. FETTER AND CO.





the King's Government as to the ordinances of their guild and the date of foundation, they made reply that as to its origin it was "Whereunto the memory of man reacheth not." The saying was a wise one. There is no institution which has had a wider distribution, or which reaches further back into the mists of ancient history; and there is, perhaps, no institution which has had a more important influence on human development.

Not only did the guilds mould and govern social life, they influenced religious life also, for there was then no distinction between the two. From almost the earliest times each guild was dedicated to some presiding genius—to the Muses, to some genius, or in Christian times to a special saint. In the Western world we have St. John, St. Michael, St. George, St. Crispin (cobblers), St. Peter (weavers), Our Lady of Pity, St. John the Baptist (tailors), St. Luke, St. Margaret, St. Barbara, St. Clare.

In the Eastern world we have Adam as the patron of the bricklayers, builders, and sawyers, Nimrod of the smiths, Noah of the carpenters, and Enoch watches over the workers of metal and the makers of copper casks.

The important meetings and feasts were held on the festivals of the patron saint; the needs of the church were largely met by their funds—they gave windows, altars, reared, built chapels, chantries, whole churches even; and when we remember that the first meetings of the Christian Church in the first centuries were held as often in the guild halls, schools, or the collegia, as in basilicas, and that in these guild halls, with their apsidal ends, (features absent from the pure basilica), we have the germ of the plan of the medieval cathedral, we see how the guild has shaped the house of religion. Even in Phœnician days we find that the factories set up in the ports scattered over the Eastern and Western world were used not merely as places of business and halls for the guilds: they were established in the first instance, and were continually used, as places of worship sacred to the cult of various deities, and a contribution was raised on all the mariners visiting the port for the sustentation of those places of worship; and in the later period of the Empire, Syrian merchants, chiefly Apamean, are found settled not merely in all Italy, but in all the larger emporia of the West—at Malaga in Spain, in Paris and Germany, at Bordeaux, Lyons, and Gaul, at Orleans and Treves. They are found in these Gallic towns after the Frankish conquest, and Salvianus and Gregory of Tours both speak of them, and show that they retained their national customs and organisations. Here then, at length, we find the Roman cities of Gaul, and probably also of Britain, with their Collegia and Sodalicæ, brought into close contact with the trade associations of the Syrians, representing the Greek and Phœnician tendencies of the commercial East. We must remember that the commerce in those days compares very favourably with the present day. In Central Asia, in Tibet, and Mongolia the plains, now and in the past, were dotted with flourishing cities, the capitals of powerful kingdoms, bound together as by bands by great trade routes traversed continually by crowded caravans. Merchants from Macedonia found their way to farther China, and threaded the passes of Afghanistan and Cashmere on their way to the Hindoo peninsula. Then from all these countries came traders, themselves masters of some craft, travelling with their wares over the Indus, over the Euphrates to Syria, up the Oxus to the Caspian, thence to the Black Sea and Europe. Now Central Asia is waste, the Oxus no longer flows into the Caspian. The streams of caravans have ceased, and life flows in other channels.

The Phœnicians, with their fellow-civilisations, have faded utterly away. Through their descendants the Greek-speaking Syrians continued their work. But imagine the influence that these wandering guildsmen and their descendants exerted while they lived. Can we wonder that architecture is a romance book when it was written by men who came daily into contact with these living records of adventure—men with minds stored with strange legend, full of fascinating tales, who threaded the ways of Western Europe, resting awhile at each notable town, the guest of their own or the local guild, where we picture

them seated with the master and the wardens at the high table, the swarthy, prick-bearded, keen-eyed Syrians, recounting adventures, pouring out traveller's tales to the open-mouthed craftsman, who from this living book got an inkling of Oriental learning, heard the latest legend, heard of the last new statue, carving, or masterwork in metal, made by members of the Eastern guilds. He would see open before him bales of strange stuffs: the guildsman would display his bronze and silver ware, his belts and brooches, his earrings and bands of gold, and all, from the master to the apprentice, would drink in the influence of the East, as mystical, as wonderful to the Western then as now. Thus we get the guilds as the disseminators of culture, distributing centres of intellectual force as well as shapers of society. They were publishers of living, useful knowledge, loops in the network of organisation which art and trade, even in those early times, had thrown over the civilised world.

The influence thus gained by these organisations naturally fluctuated—wars, tumults, invasions, each brought disturbance and destruction with them. But guilds founded on an unchanging human principle grew steadily in power until, in the Middle Ages, in England and the Continent, as Dr. Lambert says, the whole municipal, industrial, and social life moved in the circle of the guild. The guilds were the chambers of commerce, the friendly societies, the trades unions, the freemasonry, joint-stock companies, the militia, and the police, and in a way were local Parliaments. As early as the end of the twelfth century the Rectors of the Art Guilds in Italy assisted the Podesta, or supreme magistrate, in governing and ordering the cities in which they lived. More than this, the guildsmen, by their shows, pageants, and miracle plays, provided largely for the amusements of their times, and laid the foundation of dramatic art, which later was to give us Shakespeare, Molière, Goethe. They were at once the heart and brain of their people, and in studying their history we are carried back and plunged into that throbbing life which, though it produced them, they directed, and we see in what an extraordinarily simple way the whole thing was managed. Members of one great family, they sat beside each other in the feasts, played in the miracle play, rode in the pageant, fought side by side with the others, and in siege time together paced the ramparts; they helped each other in distress, saw that likely youths were made apprentices, and sang masses and burned candles before Our Lady for the peace of the souls departed. In studying their records and their works we are touching the living body of a living society: we walk with the young apprentice through the narrow streets to his master's shop; we learn the secrets of the counting-house, the mysteries of the crafts, and we understand how it is that our fathers did these wonderful works which we emulate in vain, and how futile it is that isolated individuals should try to imitate or repeat what were the products of wide-based, close-linked society, instead of seeking the same harmonious and intimate relations with their surroundings which our fathers established, and working out ourselves naturally on the firm basis of individual craftsmanship. But the origins of this want of harmony with our surroundings are to be seen even in the works of the best period of the Renaissance; for after the ebb of that tide of effort which gave us the fine early work at Verona, Venice, and elsewhere, we see traces of the intrusion of the designer into other spheres. We have the painter and the sculptor designing for the metal worker, not executing the work for himself, but getting others to do it, and this invasion of the designer soon developed into the establishment of design as a separate faculty as we know it now.

To return for a moment to the consideration of the prehistoric crafts from another standpoint. These integers of design, detached, disunited, the scattered seeds of architecture, yet contain in themselves the essence and the promise of the highest art. The natural craft, the uncultured artsmanship, was limited in range and achievement, because it was the product of isolated minds, but when men banded together the gestation of architecture advanced another stage. The work of each man was modified in aim and character by that of his fellow, just as the single circular cell of the primitive bee became hexagonal when clustered with

other cells of other bees. The comb is the logical outcome of bee society. In like manner each of us is modified by contact with other natures in the close-packed human crowd. As the body is built up of cells, each modified by the position and functions assigned to it, but each aiding by adding its individuality to the general system—in the production of the complex organism man—so man as an infinitesimal into the social system, and is modified and developed by new conditions into a newer and higher being. His art has undergone precisely similar changes. The rudimentary arts of our ancestors, when brought into mutual contact, were changed in character and raised in aim, though the fundamental nature is the same. The personal arts were the individual components out of which the body of architecture was ultimately to be shaped. The self-centred, single-expression art has become a social expression. The man, no longer concerned solely with himself, is informed by a new spirit. The scattered items are united by the social idea—the work of those items in every department of life is shaped and guided by the spirit of the race, and is the material expression of that hidden life, guiding soul, which everywhere animates society.

Architecture is thus a complex art, a social art; it has never been and never can be a one-man art, as painting and the crafts, any more than a body can be composed of only one cell. And as that material envelope of the human spirit we call the body is the absolute expression of the human soul, so that material envelope we call architecture is the absolute expression of past states of the racial soul. This it is which gave the artist such strength in the past. His was not a detached existence, a separated, solitary-studio life; he had the whole body of the people behind him. He was the point with which the nation wrote its history. He was the tool of the race. And were we psychologists enough, were our powers of divination great enough, we might read in the open scroll of building not only the history of the actual craftsman, but the history of his time and people, and gain a graphic idea of the growth of mind. This because the craftsmen were the means of architecture—and the buildings were the opportunities of craftsmen.

The key to human development is found in evolution, and the key to architecture also is found in the gradual evolution from arts and crafts unconsciously. It is the unconsciously produced record of mental development. It is a kind of spiritual skeleton. A cathedral with its innumerable cells and vaults, its pillars, spires, and pinnacles, bears the same relation to the complex organism which produced it that a sponge bears to its secreting cause. It, like the sponge, is the symbol, the formula, the evidence, of vanished life. Our judgment, therefore, of the cathedral as a thing in itself, merely as the production of the conscious art of one man, is as valueless as a criticism of a sponge would be, made by a man who had never seen the living animal.

Just as the sponge is built up under the stimulus of the life of it by the labours of countless silica secreting cells—each cell the descendant of a long line—so the cathedral is made by a number of stone-laying organisms under the stimulus of the collective life, religion, enthusiasm, ordered by the directing mind of the master, who is himself but the servant of a greater power. All the separately acquired skill, all the individual art and craft, all the personal life of each individual is fused into the general mass, and is there given new importance by sharing in that mass. The building is enriched by the work of the individual item, and that work is in turn ennobled by being part of the building. The harmonious aggregate of the personal arts becomes the impersonal, the human—the racial art of architecture. What is true of the great things is true also of the lesser. The lower order of buildings, to use the common distinction, were produced by humbler organisations, and, because they were the simple, direct, and logical outcome of special social needs, were beautiful in structure with the beauty that one feels in a leaf, a plant, a shell. The work was beautiful not so much because beauty was sought, but because the work was the natural expression of the lives of men in harmony with their surroundings. Its value to us is in the unconscious evidence it gives of the minds of those who produced it. For what is most precious in our own work is



not what we consciously seek for, nor what it is our will to express, but what we unconsciously reveal of ourselves, our race, our society, our condition.

Now, it must be evident that if architecture is thus a natural, social, racial art, if it be produced not by the will of single individuals, but is the expression in masonry of the working of time-spirit, then it must be clear that what we are doing to-day cannot be called architecture, simply because what passes for such is produced under quite different and quite artificial conditions. It may be interesting—to the sociologist; it may at times be beautiful; it is not, properly speaking, architecture. Modern building, when it is beautiful, is always the work of artists who by hazard have made bricks and mortar their medium of expression. They would have done notable work in any material; but, in judging of the building of a nation, we must take the mass of it, and not the sporadic works of men who were artists first and builders afterwards. Judged by the mass of brick and mortar raised to-day, there is little to be proud of in the art that produces such works as—[any building each of you particularly dislike].

This brings us down to our own day. The fact is that Renaissance is notable presumably for architect's architecture. It is the work of architects who designed, as distinguished from those who did. But though it and the architecture of design was so produced, the men who did it were real craftsmen in the completed sense of the word. Look through any biography of the mediæval masters and you will find that they were almost without exception trained first—as goldsmiths, painters, sculptors, workers in wood, ivory, and mosaic; they were employed chiefly as designers, architects, when they had attained eminence in the crafts. The hard training of work in material had filled them with ideas and enlarged and rounded their ideals. Having mastered one or more arts before they touched design as a separate thing, their work had a sculptural completeness impossible of attainment in any other way. But we must not forget that much, if not all, of this completeness came from the unifying labours of the creative craftsmen associated in the guilds, then in the very height of their power. Though the skeleton designs were prepared by the master sculptor and the proportion settled before the building was begun, the designs were overgrown, veiled, and clothed by the individual creation of the special workman to whom each portion of the building was assigned. Those workmen trained under and elected into the guilds put into their work unhindered, though directed by the designer, all that their skill enabled them to express of ideas and the tradition of their guild, and for many years we do not perceive the necessarily mechanical methods to which the designer, considered as the user of a separate faculty, was necessarily reduced.

But these mechanical or scientific methods are there, becoming more and more evident—as time goes on—until the building is turned into a mere setting for a variety of the delicate and beautiful works of men who, without ceasing to be artists, are daily less associated in the vital design of the building. Their work ceases to have those organic relations to the whole which we find even in eighteenth century buildings in England. The art of design is in the process of evolution into artifice; the designer becomes more and more specialised into a constructing draughtsman, the maker of graphic specifications for buildings instead of the actual maker of buildings. Little by little he loses hold of the guilds, and then makes the artists become specialists each in his own department; the guilds dissolve, and as the importance of the design increases their powers decrease, and that great tide of life—of whose existence they were the evidence—finally ebbs away, leaving as the last product of the Renaissance—the final flower of all that cultivation—the modern architect, high and dry as the arid peaks of individual effort, cut off from any possibility of doing as he might wish, condemned to more than Sisyphean labour of producing something out of nothing, while deprived of means to do it. That is the position in which we found ourselves but a little while ago.

It is manifestly illogical to blame the architect for being the result of a perfectly natural process of evolution; it is equally illogical to expect from a man the work of a multitude, or to get from a molecule the momentum of a mass.

It is all very well to show why a thing is wrong, but it is important for us to know what we ourselves are to do—and this, though difficult, is not impossible. In the first place, as architecture is built up by the harmonious co-operation of the natural aptitudes of many individuals, it is necessary for each to follow his own particular bent, and to devote himself to that work to which he feels most drawn, and in the vast field of building there is ample room for the effective working of every talent and the display of every power. And, inasmuch as all the crafts are necessary to architecture, there need be no strife for precedence, for we all, as in life, are interdependent. Just as there are diversities of gifts, but the same spirit, so there are diversities of crafts with the same art working in all, embracing all, inspiring all. The lead worker who does a fine font, the silversmith who creates a chalice, the modeller, the plasterer, the mason, the waller, and the sculptor, the carpenter, the joiner, and the carver are all necessary, and all equal, in so far as each does the work to the best of his ability. There is neither greater nor less in the kingdom of art—all are the servants of their own souls, as they are the servants of God—and that is the art of the whole matter.

I do not mean by suggesting that each man should take up a craft, to advise the dilettantism which dallies for an hour or two in the evening over some easy bit of work, done at a loose end, without reference to any actual building, although even that is not to be despised if it leads to a truer perception of the nature of building. I mean this, that each should determine to be—as the old men were—a craftsman first and an architect afterwards, for it is futile to talk of directing the handicrafts if we are not in some degree craftsmen ourselves.

Moreover, the value of the craft study lies not alone in the manual and mental training we derive from it, but in this, that the very processes of work suggests other designs; the original pencil sketch is modified or abandoned as the thing we make takes form. When we have done the work, and placed it in some corner of the studio, the actual faculty which was held somewhat in abeyance by the ardour of work reasserts itself: we see defects of design and remedy them. As the light fades or changes, the work takes on new aspects, and becomes the starting point of an entirely new and living set of ideas. It is a source of fruitful suggestion while it remains there; whereas, when the original sketch, drawing, or design has been handed to a tradesman, not only do we lose the full power of modifying work in progress, not only do we lose the suggestiveness of process, but the work when done is neither our own nor the workman's, it is an illegitimate birth, and bears the marks of it on its face for all who have eyes to see. What is true of the lesser art is true of the greater—unless you live with your buildings, unless your craftsman's knowledge is hourly used to support up your artistic inspiration, and organise the work of other craftsmen associated with you, not all the drawings in the world will produce a building fit to be called a piece of architecture. And that, in spite of the hopeful enthusiasm and the passionate earnestness which characterises the rising generation. Now, having tried to tell you what might be our aim, let us consider how our object is to be accomplished.

This, again, though difficult, is not altogether impossible; we must first consider what our actual position is to-day; we, as the descendants, in point of time, from the scholar-architects of the Renaissance, find ourselves in an age in which labour is organised, not to produce the finest kind of work, but to regulate the hours of labour and the rate of wages. The Trades Union takes the place of the guild. Separated thus from the very means by which fine building was done, architects are themselves organised into a profession, and, instead of being actually concerned in the work of building, produce briefs and diagrams from which erections are raised. Almost from necessity the methods of the counting-house have to be employed in the simulation of art. The man whose energy and intellectual labour supplies the directing power and lays down the lines of work is, also from necessity, very rarely present while that work is carried on. The specification, the contract drawings, and details are the modern substitute for co-operative design carried out under the eye of the master builder. How to begin to evolve living art out of this middle of dead systems seems

almost hopeless, but I believe that a beginning—and that a very hopeful one—has already been made. This beginning is to be seen in the revival of interest in individual craftsmanship, and in the result of that revival the School of Art and Handicraft in Regent-street, where you all know so well. I see beginnings of better things in the increasing numbers of men who are forsaking the easel for the furnace, the drawing-board for the banker, the office stool for the forge and the workshop. For many perhaps most, architects this is impossible, but it is possible for everybody to co-operate with the men who are trying to improve the standard of work by doing work themselves.

This co-operation might take many forms. The decorative work required in any building, instead of being handed over to the commercial firms, might be entrusted to the various men now working who have made those crafts their own. The design would naturally be left to the craftsman, after the general scheme of the building had been explained. The amount of work which the architect would be spared is incalculable, and his building would gain in distinction.

The droves of young sculptors who now haunt the studios in search of work might win their spurs in architectural sculpture, which is practically a lost art; while the still more numerous painters might be given commissions for wall decoration, instead of handing that work over to the wealthy and over-busy firms. And so on, round the whole crafts. In a very short time we shall have a large number of craftsmen who will be fit to erect buildings by themselves, without the aid of the professional architect. With a little judicious training and reining in, we should at least get interesting work to look at.

This, however, does not by any means exhaust the ways in which the new architecture might develop. Those who do not feel called to the crafts could take up the engineering side of building—for the vast work of providing for our daily extending commerce must obviously go on. The necessity for careful, honest engineering work, the still greater need for efficient and continual supervision, seems to me to offer numberless opportunities of congenial and remunerative work to capable men; and this work, the less acknowledged as when well and simply done, is just as valuable to society as the beautiful craftsmanship which appeals to every passer-by. We cannot all be craftsmen, but there is room for all if we only make room for ourselves.

I think, moreover, that those architects who are favoured by fortune with a plenitude of building work have it in their power to create almost at once a school of associated craftsmen who might do for the buildings of to-day what the Associated Craftsmen of North Italy—led by such men as Orgagna, Nicola Pisano, Lorenzo Maetani, Mino da Fiesole—did for the buildings of their day. All the elements are here. When we have sculptors like Alfred Gilbert, Thorneycroft, Bates, Stirling Lee; painters galore; metal workers like Alexander Fisher, Nelson Dawson, their pupils and followers—what more could we desire? Our happiness is always next door awaiting us. There is no need to search the world for it, and it is the true happiness in which lies the full activity of every faculty in the opportunity of the complete and rounded development of the whole man. But it is essential that our architects should abate somewhat of the professional dignity which encloses them, and give the craftsmen freer play; then in time we may see a new Architectural Association on the ruins of the old, but it will only be done when we have for ever got rid of the architect.

Colonel Prendergast, having been called upon by the Chairman, thanked them for permitting him to be present at their meeting, which he had long desired to be. He had not, however, expected to take part in the discussion, and would only express the thought that there were a great many debatable points in what they had heard. He noticed that there were some well-known members of the Institute present that evening, and he wondered what they thought of the idea of the transposition of the workman into the position occupied by the architect. The fact was, that that could not be done; as the workman, as we knew him, was scarcely able to take up that position in a work where unity of design was required. As the reader of the paper had said, the place of the ancient guild had been taken by the trades-union, and everything now was a ques-



tion of wages and hours. The great workers of the Renaissance periods undoubtedly were allowed a large amount of freedom; in Spain, for instance, the architect was known as the master builder, and some of the greatest cathedrals in that country were built by him; but it must not be forgotten that he was the "master" builder. Every worker could not be allowed to do what he pleased in his work; there must be a directing mind. He proposed a vote of thanks to Mr. Ricardo for his Paper.

Mr. Halsey Ricardo seconded the vote of thanks, and remarked that he agreed to a large extent with the remarks of the reader of the paper. The work of the present day was out of key with the life of the present day, though it was extraordinarily interesting and able. To this statement, of course, there were numerous exceptions. But generally speaking, though it was exceedingly interesting it was not really and honestly in touch with the life of the present day. Most of the houses built now would, in fifty years' time, when one looked back on them, have a curiously pathetic interest—like the houses built fifty years ago, when the Gothic revival set in. There were greater facilities now in the way of building materials than there were fifty years ago, but for all that buildings continued to be erected with a kind of disregard of those facilities. They were antiquarian in their charm—learned and cultivated. The Romans had unintelligent slave labour, and they drove them to breaking stones and mixing ingredients. We could do the same, not with men, but machines. Take concrete, for instance, and consider what use the Romans made of that material. Another new material which we had at hand was steel, and that we used on the sly; if used vertically it was encased in Doric columns, or something like that; and if used horizontally it was veneered with thin plates of stone to look like an incredible lintel. We did not know how to use these materials, because we were not really in touch with them. If we had been brought into intimate touch with them and had learnt to know their capabilities we should use them much more frankly and intelligently, and not in the insincere way we did. We did not seem to recognise that we are living at the end of the nineteenth century, with its extraordinary facilities (which the men of the past did not possess). To ignore all this, and to try and ensconce ourselves behind some building of another day, was insincere, and anything insincere had no life in it.

Mr. Christopher Whall said he had three things prominent in his mind after listening to Mr. Wilson's paper, viz., the very interesting description which had been given of the old trade guilds of the past; secondly, the hope which had been held out to them as a substitute for the evils of to-day—the hope springing from the attention now being given to technical education—and, lastly, the steel and concrete view which had been expressed by Mr. Ricardo—a view which rather completed a feeling of bewilderment. At the bottom of all these art questions there was the one question: were they going to be men or machines? Were they going to be men and work like men, or pivots in a system? We must welcome any effort made in the present day to make men more human and to change the mechanical lines on which so much had been done—any effort to make them craftsmen. He thought there was great hope in that direction; it was, in fact, one of the most encouraging signs that the word "craft," which was almost unrecognised as an English word fourteen or fifteen years ago, was now very frequently used. He was quite surprised to come across the expression "arts and crafts" in the wonderful essays which Mr. Rudyard Kipling had just written on the Navy. Technical education, which was engaging the attention of the London County Council in a marked way, was a movement full of promise, and the results so far were most encouraging. He hoped that the feeling of enthusiasm for the movement which was now abroad would grow and that it would produce something more like that which had been lost.

Mr. H. T. Hare said that an architect's life was too short to enable him to become master of all the various arts and crafts which constituted architecture. All that an architect could hope to do was to get a general knowledge—even in some cases a superficial knowledge—of the trades allied to architecture. An architect who attempted to design all the pieces of craftsmanship which constituted a building was

guilty of a good deal of presumption. At the same time he could not agree with the idea of abolishing the architect and of putting the craftsman in his place; the craftsman had his place; but so had the architect. If a body of craftsmen were to be allowed to take the place of the architect, could they carry out the whole arrangement of the building without one guiding mind—a master mind? Each man would be so likely to strive to secure his own way without proper subordination to the others. The result would be that the architecture of the building would be left out, and it would be made up of a number of different pieces of work—many of them beautiful pieces of work, no doubt—but entirely separate and with no co-ordination to each other. It did not matter what they called the master mind, but he did not see how a mind dominating the whole work could be dispensed with. If a craftsman were given a space, say, where he was to put a piece of metal-work, or carving, or modelling, he (the speaker) could not see why he should not produce the very best work, even when his efforts were limited to a proper regard for the surroundings. He could not see why that man should be less enthusiastic for that work than if he were entirely free to cover as large or as small a space as he liked.

Mr. Thomas Blashill said that he must confess to a feeling of surprise at the line the lecture had taken. He agreed with the early part of the lecture dealing with the question whether architecture was or was not the mother of the arts; the lecturer's view might well be considered, and it might be found to be sound. But later on the lecturer drifted into the question of architecture, which was another thing, and did not properly come within the title of his address. He (the speaker) had heard such views for over forty years in London lecture rooms, beginning with the old original Architectural Museum at the Coal Bunkers at Westminster, and he felt a little hardened by this time. About such views there was a tone of dissatisfaction with everything that was done, but he hoped they would not be affected by it, but would reject its influence, and only accept the undoubted good there generally was in such addresses. He should not like to take the responsibility of suggesting to them that the road they were pursuing, under all the sanctions of the past and the present—the Institute and the Association, for instance—under the sanction of almost every one who had spoken or written on the subject, was the wrong road. To tell them that if they were to follow some trade one in forty would perhaps become an architect, was not very hopeful reasoning. If they were to follow such advice, and were to sacrifice their careers, they would be just as dissatisfied with everybody and everything. What they had heard was the view of the pessimist, and it was partly a constitutional view. It might be the result of the national food, or national pastimes. Architecture was the profession they were all following, and they must make the best they could of it. He did not see why a man was less likely to succeed as an architect than a sculptor or a painter. He failed to see the evidence for it, though he saw that their masters were wrong in being driven into copyism so much. But surely, sooner or later, they would evolve something in the shape of invention on their own account, and in his opinion there was no reason for discouragement. They should carry on their architectural work in order to do something on their own account, and it was always possible to call in the painter or the sculptor, for instance, to carry out certain works. He had seen buildings where the sculptor must have called in the architect and told him where to put the building. He had been thinking about the design of a Swiss chalet. There was not much sculpture in such a building, and if they analysed it—the work no doubt of a village workman, a builder in wood—they would see the latest specimen of original architecture. From the last quarter of the seventeenth century up to the end of the eighteenth century (when the French influence made itself felt), architecture was not dead in such work. He agreed with Mr. Ricardo's remarks about new materials; these materials had their uses, and architects should pay more attention to them.

Mr. D. T. Fyfe said the question was especially one for young men. Was architecture to be the work of one man, or was a building to be erected by various craftsmen? Young architects should think for themselves whether arts and crafts was the right road to

true architecture, or whether it was better to have a master mind governing the whole. The planning of a large modern building was the work of the architect, and he did not see how a number of craftsmen, each concerned with the artistic rendering of his own particular work, would be able to agree as to planning of such a building.

Mr. H. B. Creswell said he was surprised that the paper had not been strongly endorsed by the meeting. They had all seen the work of the early part of the century, and they knew that nothing of any value architecturally was produced therein. The whole of the Gothic revival was a fraud and a farce; it was false in impulse, and it produced nothing that was of real interest or value. They saw for the first time, say, a fine church of the Gothic revival, which seemed to be pleasing; the second time they saw it they felt annoyed by it, and subsequently they felt how glad they would be if the church could be removed from their sight. The impulse of such work was foreign to the true impulse of what national architecture should be. Mr. Wilson had tried to show what the right impulse of the present day should be, and how the direction in which they were now working was not that from whence the great art impulses of the world had sprung. In the future people would look back upon the present epoch to discover its characteristic note, and it lay with the workers of to-day to decide what that note should be. It would be vile if it was not conscientious and honest. And that was the one extraordinary thing about all art impulses; however rude and archaic they had been, so long as they had had the enthusiasm of the nation behind them they had had value. The most crude examples of the Elizabethan style had a real charm because of the sincerity of their impulse. But look at the work of William Blake—poet, painter, and decorative draughtsman—his work was not national; he shut himself up in a cell and his work had no real value. The men of the future would look back and judge us by what we had done; and it was rather interesting to try and find out what the characteristic note of the day was so far as architecture was concerned. He had tried, and he had come to the conclusion that it was typified in public-house architecture and in underground lavatories. Yes, and if he had carried out such works he should be proud of them. They had been beautifully done, and the best scientific thought of the day had been expended on them. In the last ten years there had been more marble used in such works in London than had been used in all the churches in the century. The public-house was utterly vulgar, but it belonged to no other time and it was honest. He believed it was the only form of national art we had, and unless we saw to it that our work became more honest and sincere in its impulse, that would be the note which would be handed on to posterity as characteristic of the present time.

Mr. G. M. Nicholson said that one thing seemed to be overlooked, and that was the difficulties the architect worked under to-day—difficulties which did not affect the architects of past times. Take London, for instance, where a good many buildings were put up; the London architect had to consider how to use up every inch of space; he had to be extremely careful about light and air; time was of very great importance—in fact, it was an absolutely essential condition—while cost was another most important matter. In the olden times the old cathedrals were apparently put up without very much regard for time or cost, nor was labour so independent as it is now. If a workman wished to be artistic, that necessitated working slowly, and the elements of time and cost did not permit of that. Even in private houses, cost entered very largely into the question. A man's first idea about his house was the accommodation he would require, and his second idea was the limited amount of money he had to spend. An architect was confronted with a scale of wages which was absolutely rigid: he must pay the very worst workman so much and no less, and he must pay a high price for the very best work, especially if the skilled workmen were given sufficient time in which to do it. The manner in which modern architects met all their difficulties showed that, if anything, they were superior to the architects of past times; they had to meet a totally different set of conditions, and on the whole they did remarkably well. They had to meet the wishes of a commercially-minded people, who



wished for speed and economy and they had to produce what the client asked for. If the client wanted a cheap building in a short time, the architect had to erect it; if he would not do it, another man would, and the first architect would be left with his ideals, and nothing else, to live on.

The Chairman, in putting the vote of thanks, said that the lecture was a very interesting and thoughtful one; perhaps a little exaggerated, though it was only by such extravagance that people were made to think that there was something behind what one might be saying. He thought there was this behind Mr. Wilson's remarks: that architects were not, as a body, in touch with the craftsman as they should be. He could not go so far as Mr. Wilson, and say that each and all of them should engage in craftsmanship, for that seemed to him to limit the view of architecture as they thought of it at present—it limited it to a very small compass. He did not think it reasonable or practical to throw up all their present ideals of architecture—all they had been taught from very early days, all their artistic work—for bricklayers', carpenters', or carvers' work. He knew one or two who had given up architecture for ironmongery and they worked at it sincerely from a purely art point of view, and they made a bare living in that way. Let them take men like William of Wykeham. He was a man who had a wonderful capacity for planning; but they could not believe he was a workman himself; it was his monks, who formed a guild, a regular school, who carried out his works. Mr. Wilson's description of craftsmen going about to commercial cities in their caravans, picking up ideas from all quarters, was a very nice picture, but it was, he thought, a little fanciful. But he was in sympathy with a good deal that Mr. Wilson had said, and he only wished the Association had a school of crafts of its own—that they had craft workshops, so that they might learn how to construct masonry and carpentry, how to model, &c., and thus be able to, at least, tell the craftsman whether he was right or wrong in the methods he adopted. What Mr. Ricardo had said about materials opened up a new line of thought. Architects of to-day had to meet new conditions, and if there were scope in modern architecture it was in the proper design of both wrought and cast iron and steel. What was wanted was good design, not copies of work turned out over and over again, like that which was illustrated in trade catalogues. He agreed with Mr. Whall, that there should be a greater development of technical education. He had looked over the school in Regent-street recently, and he felt that Mr. Lethaby and those who were working in the same direction, were entering into the work with an honest endeavour to do the best they could for architecture; and he believed that their work tended for good. Mr. Blashill had given them the views of the opposite school of thought, and his remarks were useful; but he (the speaker) thought that Mr. Wilson would urge that the Swiss chalet was an example of the craftsman's work, and the kind of work he would like to see more of. But however much they might believe the theory that architecture was a growth of the crafts, they must not think they could suddenly create a style of their own—that they could build solely on a miserable foundation made by themselves. They must build with a knowledge of the past, and their education should be to understand the best in the past. To reject Classic and Gothic architecture and to say it was all a mistake was utterly wrong; they must get from those styles and others the foundation of what to do in the future, though not to copy them. He was amused and interested in Mr. Creswell's remarks, but he absolutely disagreed that the Gothic movement throughout was a dead and absolute failure. There had been the Renaissance movement, which had had a great effect on the arts; and in the Gothic movement those who took part in it were working to the same end. Street did, and in his work there was the charm of individuality; it was not a copy of the past. The same applied to the late Mr. Pearson; they might say that Truro Cathedral was a copy of a Mediaeval cathedral, but there was the stamp of the man's individuality on it all. They might take a lesson from that; they must build on a foundation based on the past, but at the same time stamp their work with the mark of their own individuality.

Mr. Creswell said he did not mean that Gothic architects were insincere, but that their

motive was. The nation was not at the back of it; it was not national.

The Chairman, continuing, said that in a sense it was national. In large cities abroad they did not see modern work—the churches, for instance—stamped with the individuality which was noticeable in our own modern churches. The late Mr. Sedding himself took part in the Gothic revival, and he was a splendid example of a man who tried to see for himself and stamp his work with originality.

The vote of thanks was then put to the meeting, and agreed to.

Mr. Wilson, in reply, said his intention in coming before them was to tell them, as far as he could, what had been his own ideas and difficulties in his own particular work, so as to let them see what somebody else had been trying to do whose work was like their own; for they seemed to forget that, notwithstanding what he said against architects, he was an architect himself, and so spoke against himself as well as against them. But it did not follow, because he had spoken against architects, that he did not feel that there is a great deal in modern architecture, and that he did not feel the sincerity of a great many modern works. But, in his opinion, the architecture of the future must be a co-operative architecture, or it could not exist.

The Chairman announced that the next meeting would be held on the 25th inst., when Mr. Paul Waterhouse would read a paper entitled "Oriel and Bay Windows."

The meeting then terminated.

#### ARCHITECTURAL SOCIETIES.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The ordinary monthly meeting of this Society was held at the School of Art, Sheffield, on the 8th inst., Mr. J. Smith (vice-president) presiding, when Mr. T. Swaffield Brown gave a lecture on "Ecclesiastical and Domestic Art Metal Work." He explained that he had chosen this subject partly because it was the principal concern of Sheffield, but chiefly because architects were, of all people, those to whom the public looked for guidance. Ignorance of principles constituted the most serious danger in the modern revival. He advocated a closer relationship between the men of principles and the men of practice for the better understanding of both by each. If right principles, special skill, and subtle feeling were united, we got artistic work, not otherwise; no one or two of them would produce it. He protested against the modern work, and pointed out that the only difference in the past between, say, ecclesiastical and domestic art, was due to the purpose of the work, the only other distinction being that between good and bad. The materials were the same, the men the same, even the prevailing style the same. He was keenly sensitive to the beauty of much old work, but more concerned with the new—that which we have to live with and be remembered by. He remarked as curious that the metals now used in this connexion were substantially the same as those used in the remotest times. They were iron, copper, tin, lead, silver, and gold, and in some form zinc. Platinum, aluminium, and others had been discovered, but were not in general use. Nickel certainly was an exception, and a very mischievous one. The principles which should govern the use of these metals were common to most of our affairs. The great principle of craftsmanship was simplicity. Whatever the material and process, that it should appear to be. Whatever the purpose, the design should fit it. Whatever the character of the material, its manipulation should develop, and not destroy it. Consciously or involuntarily, actuated by these principles, and hammer in hand, the smith would do good work, and without them he would not, whether he was an art worker or no. The lecturer next dealt at considerable length with the processes of working the various metals, and the mostly mischievous modifications of them brought about by the introduction of nickel "silver," the stamp, the plating vat, and the spinning lathe, and other "improvements," pointing out the manner in which they had reduced to the highest of the metallurgical arts to the level of mechanical process. He urged them to do all that their influence enabled them to restore to its lost position, and its workers to that of craftsmen worthy of the name by encouraging the employment of the hammer in the hand, where only it could be impelled by

heat and directed by head, and become again the instrument of human expression.—*Sheffield Telegraph.*

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—On the 14th inst. the Leeds and Yorkshire Architectural Society held their annual gathering at the Queen's Hotel, when the President (Mr. George Corson) gave his address. He congratulated the secretary upon the excellent syllabus arranged for this session. It promised to be the most attractive they had had for many years. The Council had arranged to have the use in future of a large room in the old Medical School, and the hour of meeting had been changed to half-past six instead of half-past seven. The Council had had under consideration a form of agreement between builders and those for whom they built. This form had been submitted to the Builders' Association, and he hoped it would become a general basis of contract not only in that district, but throughout the country. The Royal Institute of British Architects had recently issued a revised schedule of professional charges. It was necessary that it should be understood that 5 per cent. upon the total cost of the completed building was the architect's authorised charge. Sometimes a client chose to obtain various fittings, such as chimney-pieces, grates, heating apparatus, &c., from other sources without referring to the architect, who, however, was entitled to his commission upon such fittings. Again, a client might omit certain portions of a building after estimates had been obtained and conditionally accepted. The architect was entitled to a commission upon those—not the full percentage, but at least 3 per cent. It was not where there was one client concerned, but where there was a committee or a board to deal with, that difficulties arose. Conscience was singular, not plural. Where the cost of work was small, as in alterations, it was not recognised that 5 per cent. was unremunerative to the architect, and clients thought anything higher was an overcharge, although the labour involved might be as much as in work that was of greater cost. Leeds, continued the President, was a new city, but a very old town, and it had inherited a legacy, like most old towns, from former ages. That legacy consisted of narrow streets and crooked ways, totally inadequate to accommodate the immense traffic that had resulted from the increase of population and trade. Within the last fifty years the population had increased from 200,000 to over 400,000, and was still increasing at the rate of something like 7,000 a year. From the immense increase in the value of property in the centre of the town it might be said to be practically impossible to widen such streets as Park-row and Commercial-street. There was, however, another way in which the traffic might be relieved. New streets could be pierced through dense masses of property of comparatively small value. After Boar-lane was reconstructed, the Corporation seemed to fall asleep for many years, and for some time any attempts at street improvement were spasmodic. Lands-lane was an example of this. It had taken thirty years to reach its present stage of partial widening. Private citizens had seconded the efforts of the Corporation, and everywhere enterprise was manifest. Victoria-square still needed artistic treatment. There they had one of the finest buildings in England—the Town Hall—fronted by a group of wretched buildings, only fit to be carted away. It would be well if the space they occupied could be added to the square as far back as the south frontage and South-parade. But he was afraid this idea was Utopian. Law Courts and an Art Gallery more befitting the dignity of Leeds than the present would have to be undertaken. The Art Gallery had served its purpose well, but would no doubt be absorbed either by the Municipal Offices or the Free Library. The action of the Council with regard to such architectural work as they had to direct had been brought to his notice by several members of his profession. In former days all such work was confined to members of their profession. But of late years it had drifted into the hands of the City Engineer. At the present time, he was told, certain buildings were being contracted for, the plans for which had emanated from the City Engineer's office—for a police-station, and a branch of the Free Library, at a cost of about 6,000. He (the President) would have thought the engineering work properly devolving upon the City Engineer's office would have been enough or more than enough for the energies of that



department, without encroaching upon the special field of architecture. The present Lord Mayor had architectural tastes and sympathies, and they might ask him to put an end to this anomaly.—Mr. J. Tweedale, in moving a vote of thanks to Mr. Corson for his address, thought the President took rather too rosy a view of the probability of clients, under certain circumstances, paying adequate remuneration to architects for extra labour done by them. There did not appear to be that appreciation for the architect's labours either by the individual or corporate client that there ought to be. Mr. Butler Wilson seconded the proposition, which was carried with acclamation, the President briefly responding. A smoking concert followed.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the Council was held on Tuesday in the County Hall, Spring Gardens, Mr. T. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Westminster Vestry 23,670*l.* for street improvements; the Lambeth Vestry, 3,920*l.* for paving works; the Chelsea Guardians, 1,600*l.* for additions to infirmary; and the Islington Vestry 2,231*l.* for street improvements.

**List of Wages.**—The General purposes Committee reported as follows, the recommendation being agreed to without discussion.

'We have had under consideration a memorandum from the Finance Committee with reference to the list of wages. Standing Order No. 211 provides for the preparation of a list of rates of wages and hours of labour, to be paid and observed by the Council in works which the Council may carry out without the intervention of the contractor, and the order further provides that contractors for works for the Council shall pay rates not less, and observe hours not greater, than the rates and hours in the list. This list is settled by the Council on the recommendation of the Finance Committee. The Finance Committee state that the Society of Ironfounders have requested that a minimum rate should be inserted in the list for their trade, and while considering their request it appeared to the Committee that under Clauses (2) and (4) of Standing Order No. 211 as it at present stands there is no provision for including in the schedule to the Council's form of contract trades other than those entered on the list. Clause 1 of the Standing Order refers exclusively to the rates and hours to be observed in the direct employment of labour by the Council, and Clause 2 extends by means of a schedule in each case the application of those rates as a minimum, and those hours as a maximum, to work done for the Council by contract.

The Finance Committee point out that the policy of the Council to which this order was intended to give effect was obviously to maintain the standard of rates of wages and hours of labour agreed upon and in practice obtained in each trade, and it would not appear to have been ever intended that trades other than those directly employed in its operations should be excluded; but except in the note to Part I. of the schedule to the Council's form of contract (see page 78 of the Standing Orders), the Order contains no provision for the extension to them of the general principle. The Finance Committee think that the position might be made clearer, both as regards works in the nature of construction or manufacture, and as regards the undertakings set forth in clause (4) of the order, if an addition were made to the standing order, and they suggest that standing order No. 211 should be amended by the insertion after the word "therefore" in paragraph (2), and again at the end of paragraph (4) (a), of the following words:—"*and if the contractor should employ any workman or workmen in any trade not included in the Council's list, the rates of pay shall not be less nor the hours of labour more than those recognised by associations of employers and trade unions and in practice obtained in London.*"

We concur in the views of the Finance Committee, and recommend—

That Standing Order No. 211 be amended, by the substitution of the following paragraphs for the first paragraph of clause (2) and for clause (4) (a) respectively—

In inviting tenders for works in the nature of construction or manufacture to be executed within a radius of twenty miles measured in a straight line from Charing-cross, or on a site partly within and partly outside the radius, the advertisements and instructions for tender shall state that in the case of all workmen to be employed by the contractor he will be required to pay wages at rates not less, and to observe hours of labour not greater, than the rates and hours set out in the Council's list, and that such rates of wages and hours of labour will be inserted in a schedule to and will form part of the contract, and penalties shall be enforced for any breach thereof, and if the contractor employ any

workman or workmen in any trade not included in the Council's list, the rates of pay shall not be less, nor the hours of labour more than those recognised by associations of employers and trade unions and in practice obtained in London.

4. In all contracts for the supply of raw material or manufactured articles, other than general contracts for the supply of stores to be used in maintenance, a clause shall whenever practicable be inserted that, with respect to all materials or articles produced or manufactured or supplied by the contractor, the contractor will in the production or manufacture or supply thereof (as the case may be) pay and observe the following rates of wages and hours of labour, viz.—

(a) Where the production or manufacture or supply thereof is carried on within a radius of twenty miles aforesaid from Charing-cross, the rates of wages and hours of labour appearing in the Council's list, and if the contractor employ any workman or workmen in any trade not included in the Council's list, the rates of pay shall not be less, nor the hours of labour more than those recognised by associations of employers and trade unions and in practice obtained in London.

**Central Art Schools.**—The Technical Education Board recommended the purchase of the leasehold interest in Oxford Mansions, Regent-street, for 35,750*l.* with the object of providing adequate accommodation for the Central School of Arts and Crafts. They could not buy the freehold, and the lease was for another fifty-eight years.

Mr. Peacockcroft moved as an amendment: "That in the opinion of the Council it is undesirable to place any permanent charge on the rates for the supply of technical instruction such as is involved in the present proposal while it remains undecided what is to be the authority for Secondary Education in London, and accordingly that it be suggested to the Board that they negotiate for the hiring of any premises required for the extension of the work referred to in their report."

Mr. Boulnois seconded the amendment, and said the amount asked for was more than the property was worth. After some discussion, Mr. E. Bond, M.P., Chairman of the Board, said it was inconsistent with the dignity of the Council to anticipate the day when their powers would be curtailed. So long as they were the authority for technical instruction they must go on doing their work in the best possible manner.

On a division the amendment was rejected by a large majority. Mr. Benn then moved to refer the matter back, with the view of a freehold site being obtained, and this was done after discussion.

**Working-Class Dwellings.**—The debate on the adjourned report of the Housing of the Working Classes Committee was resumed. With reference to the Cotton-street site, Poplar, the report stated that this was the remaining site on the north of the Thames set apart for the erection of dwellings to accommodate persons displaced by the construction of the Blackwall Tunnel. Accommodation had already been provided in Council-buildings, near Yabsley-street, Poplar, in accordance with the order of the Hon. Secretary, for two hundred and forty persons, and as accommodation had to be made for five hundred persons on the north side of the river, the remaining two hundred and sixty persons must be accommodated in dwellings to be erected on the Cotton-street site. The Committee recommended: "That, subject to the terms of an agreement to be prepared by the solicitor, the offer of Mr. J. Hartnoll to purchase the Cotton-street site, Poplar, for the purpose of rehousing 260 persons displaced by the Blackwall Tunnel scheme, be accepted, on condition that 10 per cent. of the purchase money of £1,400 be paid down when the agreement is signed; and that Mr. Hartnoll be entitled to a conveyance of the land when the architect has certified that the buildings have been completed in accordance with the approved plans." Mr. Piggott moved to refer the matter back to the Committee, which amendment, after some discussion, was on a division carried by 50 votes to 37.

**Kerbing and Channelling Roads, Finsbury Park.**—The Parks and Open Spaces Committee recommended, and it was agreed, that the tenders of Mr. W. Gibbs to supply granite kerbing at the rate of 4s. 4½*d.* per yard, and of Mr. W. Griffiths to supply granite setts at 30s. per ton, for use at Finsbury Park, be accepted.

**Holborn to the Strand.**—The rehousing scheme in connection with the Clare Market portion of the new street from Holborn to the Strand was, on the recommendation of the

Working Classes Committee, referred to the Parliamentary Committee to deal with in their Improvements Bill.

The Council adjourned soon after 7 o'clock.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the London Building Act, 1894. Those applications to which consent has been given are granted on certain conditions.\*

##### Formation of Streets.

**Wandsworth.**—(a) That the resolution of the Committee of May 23, 1898, with regard to the application of Mr. P. Meredith, be rescinded. (b) That an order be issued to Mr. P. Meredith refusing to sanction the formation or laying out of a new street for carriage traffic between Westlands-road and Balham Hill.—Agreed.

**Wandsworth.**—That an order be issued to Mr. W. H. Collier, refusing to sanction the formation, or laying out for carriage traffic, of a new street 40 ft. wide, to lead out of the east side of Merton-road, Wandsworth (for Messrs. A. & J. Wise).—Agreed.

##### Lines of Frontage.

**Marylebone, East.**—An iron and glass shelter at the Queen's Hall, Langham-place, at the corner of Kidington-house-street (Messrs. Leggett, Rubinstein & Co. for Mr. R. Newman).—Consent.

**Battersea.**—That the application of Mr. C. S. Peach, for an extension of the periods within which the erections of buildings by the Vestry of Battersea, in connection with the Vestry's central station for the supply of electricity, on a site abutting upon Lombard-road, Holman-road, and Harroway-road, Battersea, was required to be commenced and completed, be granted.—Agreed.

**Dulwich.**—That the application of Mr. A. Keen on behalf of Miss E. Chamberlin, for an extension of the periods within which the erection of buildings with bay windows and one-story shops on the west side of Peckham Rye at the corner of East Dulwich-road was required to be commenced and completed, be granted.—Agreed.

**Greenwich.**—Wooden pents with slated roofs over the entrances to Nos. 18 and 20, Elliscombe-road, Charlton (Mr. H. E. Bird for Mr. J. Plume).—Consent.

**Hampstead.**—An iron and glass covered way to a house known as "Lyleston," on the south side of Eton-avenue (Messrs. Done, Hunter, & Co. for Mr. J. Welford).—Consent.

**Lewisham.**—Addition upon part of the forecourt of No. 66, Rushey-green, Catford (Mr. W. Vernon).—Consent.

**Norwood.**—A fire-engine station on the west side of Herne-hill, Lambeth (Mr. R. Pearsall for the Fire Brigade Committee of the Council).—Consent.

**St. George, Hanover-square.**—Brick and glazed enclosures erected on each side of the portico at Buckland's Hotel, No. 43, Brook-street, Grosvenor-square (Messrs. Watson Bros. for Mrs. J. Chaplin).—Consent.

**St. Pancras, North.**—One-story shops in front of Nos. 35, 37, and 39, Lismore-road, Haverstock Hill (Mr. E. J. Stevens for Mr. W. W. Smith).—Consent.

**Westminster (Detached).**—Two oriel windows to buildings proposed to be erected on the site of Nos. 19, 20, and 21, High-road, Knightsbridge (Mr. C. W. Stephens for Mr. J. C. Humphreys).—Consent.

**Kensington.**—Rebuilding of the "Castle Tavern," No. 110, Holland Park-avenue, Notting Hill, at the corner of Clarendon-road (Messrs. Saville & Martin for Mr. P. H. Prior).—Refused.

**St. George, Hanover-square.**—Two iron and glass shelters erected at the entrances to "Walsingham House Hotel," Piccadilly (Messrs. H. F. Joel & Co. and T. Potter & Sons Limited, Limited).—Refused.

**St. George, Hanover-square.**—An iron and glass shelter at the entrance to the "Berkeley Hotel" and restaurant on the east side of Berkeley-street, Piccadilly (Mr. G. Reeves-Smith for the Berkeley Hotel Company, Limited).—Refused.

**Hampstead.**—A porch and angle turret and balconies to proposed residential flats on the north side of Sumatra-road, West Hampstead, at the corner of Sandwell-crescent (Messrs. Palgrave & Co., for Mr. G. A. Clements).—Refused.

**Lewisham.**—One-story cart-sheds, &c., at the rear of Clay Farm Dairy, No. 30, Burnt Ash-road, Lee, to abut upon Taunton-road (Messrs. A. Fish & Sons).—Refused.

**Woolwich.**—Six iron sheds next Siemens-road, Woolwich (Messrs. Siemens Brothers, Limited).—Refused.

##### Width of Way.

**Poplar.**—Six two-story houses on the east side of Cottage-street, Poplar (Mr. J. Fox).—Consent.

**Fulham.**—A block of one-story stables at the Estcourt-road omnibus yard, to abut upon Buckle's

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



alley (Mr. R. T. Kingham for the London General Omnibus Company, Limited).—Refused.

*Hammermill.*—A house with shop on the western side of Orchard-road, Askew-road, Hammersmith, to flank upon Landor-road (Mr. H. Biggild for Mr. Bishop).—Refused.

*Hampstead.*—A three-story dwelling-house upon the site of No. 4, Murray-place, Flask-walk, Hampstead (Mr. H. E. Haggard for Messrs. H. & W. Grey).—Refused.

*Limhouse.*—Rebuilding of Nos. 22 and 24, Ben Jonson-road, Limehouse, with the flanks of the new buildings to abut upon Ashfield-place (Mr. R. Peters for Mr. H. Mercer).—Refused.

#### Open Space about Buildings.

*Islington, North.*—A variation from the plan sanctioned on December 21, 1897, for the rebuilding of the "Boston Arms" public-house, Junction-road, at the corner of Dartmouth Park-road, with an open space at the rear (Mr. G. J. Thorpe for Mr. W. Lewis).—Refused.

#### Deviation from Certified Plans.

*Finsbury, Central.*—That Mr. H. C. Morris be informed, with reference to his application made on behalf of Mr. W. H. Scott, under Section 43 of the London Building Act, 1894, for the Council's sanction to deviations in the intended rebuilding of the "Vernon Arms" public-house on the sites of Nos. 180, Pentonville-road, and Nos. 1, 3, and 3a, Southampton street, Clerkenwell, and in the intended rebuilding of a house and shop on the site of No. 182, Pentonville-road, from the plans, certified by the District Surveyor under that section, of the domestic buildings existing at the commencement of the said Act on such sites, that the application is one which, in the Council's opinion, it has no power to entertain under that section, and that the Council can accordingly neither consider such application nor give any decision thereon.—Agreed.

*City of London.*—Deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed erection of a domestic building with a warehouse in the basement and sub-basement, on the site of Nos. 12, 13, and 14, New-street-square, at the corner of Robin Hood-court (Mr. R. C. Murray for Messrs. Spottiswoode & Co.).—Refused.

#### Width of Way and Temporary Building.

*St. George, Hammer-square.*—A perambulator shed erected at the rear of No. 6, Aldford-street, Park-lane, and abutting upon Street's-mews (Messrs. Bertram & Son for Mr. F. Hartmann).—Refused.

#### Lines of Front and Width of Way.

*Fulham.*—That the application of Mr. C. F. Smith, on behalf of Mr. T. H. Sheen, for an extension of the periods within which the erection of a new building on the north-west side of New King's-road, partly upon the site of Nos. 182 and 184, at less than the prescribed distance from the centre of Fulham Park-gardens, was required to be commenced and completed, be granted.—Agreed.

*Chelsea.*—A one-story shop upon the forecourt of No. 110, Marlborough-road, Chelsea (Mr. A. J. Wordley for Mr. G. Wordley, jun.).—Refused.

*Hackney, Central.*—A two-story workshop at the rear of No. 5, Wilman-grove, to abut upon Appleby-road (Mr. A. Brown).—Refused.

*St. Pancras, West.*—An iron and glass covered-way, upon part of the forecourt of No. 4, Euston-grove, to abut also upon Euston-street (Mr. C. Randall).—Refused.

#### Line of Fronts and Temporary Building.

*Dulwich.*—A wooden serving-bar erected in front of the "Walmer Castle" public-house, Peckham-road, Camberwell (Mr. J. Brooker for Mr. G. J. Brown).—Consent.

*Wandsworth.*—A wooden shelter for cabmen, at the cab-rank in the road skirting Balham railway-station and connecting Balham High-road with Bedford Hill (Mr. F. Perks for Mr. R. Simpson).—Consent.

#### Height of Buildings.

*City of London.*—New offices on the Victoria Embankment to abut at the rear upon Tallis-street, and flank upon Temple-avenue, and to exceed in height the width of those streets respectively (Mr. A. N. Bromley for the National Telephone Company, Limited).—Consent.

Recommendations marked † are contrary to the views of the Local Authority.

#### BOOKS RECEIVED.

MODERN OPERA HOUSES AND THEATRES. By Edwin O. Sachs, Architect. (B. T. Batsford.)

THE CONDUCT OF BUILDING WORK; and the Duties of a Clerk of Works. By J. Leaning, F.S.I. (B. T. Batsford.)

CHINESE PORCELAIN. By W. G. Gulland. (Chapman & Hall.)

"PRACTICAL ENGINEER" POCKET-BOOK FOR 1899. (Technical Publishing Company.)

#### THE SOCIETY OF ARTS.

##### LONDON'S CONGESTED STREETS.

ON Wednesday the opening meeting of the 145th session of the Society of Arts was held, when Sir J. Wolfe Barry, the Chairman of the Council, read a paper on "New Thoroughfares and Street Improvements in London." By London he explained that he meant the Administrative County and the southern portion of West Ham, an area nearly oval in shape, containing about 112 square miles, and a population of nearly five millions. In the course of a review of the railways made or widened in this area within the last forty years, he said that not less than 60,000,000 had been spent on this work, more than one-half of it during the past twenty years. The result had not answered the expectations formed by the Parliamentary Joint Committee in 1864. He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

He estimated the daily number of persons entering and leaving Urban London by railways alone from and to the suburbs at 900,000. All these people were thrown on the streets. Then since 1871 omnibuses and trams had multiplied threefold, while cabs had increased from 7,000 to 11,000. Only the passenger traffic on the river had decreased. Then carts and waggons had so increased that their procession in and out of Central London was almost continuous. Finally, there were bicycles. As a result of observations, he found that in a busy hour there passed in Chesham 922 vehicles and 6,358 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians; in the Strand, 1,228 vehicles and 10,000 pedestrians.

#### HEIGHT OF BUILDINGS IN GLASGOW.

ACCORDING to the *Glasgow Herald*, a meeting of the Building Regulations Committee of the Glasgow Corporation was held on the 9th inst. to consider the Amendment Bill of the Building Regulations Act, which will be introduced into Parliament this session. The following draft clauses of the new Bill were adopted:—

1. A building (not being a church or chapel) shall not be erected or, or be subsequently increased to, a greater height than 80 ft. without the consent of the Corporation.

2. Whenever the Corporation consent to the erection of any building of a greater height than that prescribed by this Act, notice of such consent shall, within one week after such consent has been given, be published and served in such a manner as the Corporation may direct, and the consent shall not be acted on till twenty-one days after such publication or service, and the owner or lessee of any building or land within 100 yards of the site of any intended building who may deem himself aggrieved by the grant of such consent may within twenty-one days after the publication appeal to the Tribunal of Appeal.

3. No building of the warehouse class shall extend to more than 250,000 cubic feet, unless divided by party walls in such manner that no division thereof extend to more than 250,000 cubic feet. No addition shall be made to any building of the warehouse class, or any division thereof, so that the cubical extent of any such building or division shall exceed 250,000 cubic feet.

4. Where the Corporation are satisfied, on the report of the Master of Works and of the Chief Officer of the fire brigade, that additional cubical extent is necessary for any building to be used for any trade or manufacture, and are satisfied that proper arrangements are made, or will be made and maintained, for lessening, so far as reasonably practicable, danger from fire, the Corporation may consent to such building containing additional cubical extent, provided that such building shall not (1) extend to a number of cubic feet exceeding 450,000 or any less number allowed by the Corporation without being divided by party walls in such manner that the cubical extent of each division do not exceed that number; (2) exceed 60 ft. in height; (3) be used for the purpose of any trade or manufacture involving the use of explosive or inflammable materials. Such consent shall continue in force only while the said building is actually used for the purpose of the trade or manufacture in respect of which the consent was granted.

5. (1) Buildings shall not be united except where they are wholly in one occupation, or are constructed or adapted to be so. (2) Buildings shall not be united if, when so united and considered as one building only, they would not be in conformity with this Act. (3) An opening shall not be made in any party wall between two external walls dividing buildings, which, if taken together, would extend to more than 250,000 cubic feet except under the following conditions:—(a) Such opening shall not exceed in width 7 ft. or in height 8 ft., and such opening or openings taken together shall not exceed one-half the length of such party wall on each floor of the building in which they occur; (b) Such opening shall have the floor jambs and head formed of brick, stone, or iron, and be closed by two wrought-iron doors, each one-fourth of an inch thick in the panel, at a distance from each other of the full thickness of the wall, fitted to rebated frames, without woodwork of any kind, or by wrought-iron sliding doors or shutters properly constructed, fitted into grooved or rebated iron frames; (c) if the thickness of the wall be not less than 24 in., or the doors be placed at a distance from each other of not less than 24 in., such opening may be 9 ft. 6 in. in height. (4) Whenever any buildings which have been united cease to be in one occupation all openings made for the purpose of uniting the same in any party-wall between the buildings or in any external wall shall be stopped up with brick or stone work not less than 13 in. in thickness (except in the case of a wall 8½ in. in thickness, in which case 8½ in. shall be sufficient), and properly bonded with such wall, and any timber not in conformity with this Act placed in the wall shall be removed. (5) Whenever any buildings which have been united cease to be in one occupation the owner thereof shall forthwith give notice to the Master of Works, and shall cause any openings made in the party-wall to be stopped up and bonded as aforesaid.

On the 10th inst., the Building Regulations Committee met again to consider the Amendment Bill of the Building Regulations Act. The draft clauses of the new Bill were gone over in detail. The committee agreed to recommend that the height of buildings to the top of the wall head shall, in no case, exceed 80 ft. In streets which are less than 40 ft. in width buildings shall not be erected to a greater height than the width of the street; in streets which are more than 40 ft. and less than 60 ft. wide the buildings shall not be higher than the width of the street, plus 20 per cent.; but buildings in streets above 60 ft. wide may be erected to the maximum height of 80 ft. The object aimed at in the Bill, which will not be retrospective, is to encourage the formation of wide streets.

NEW MAYOR OF HULL.—On the 9th inst. Council W. A. Gelder was elected Mayor of Hull, and Mr. Harold J. Reckitt, M.P., Sheriff. The new Mayor, who is a Fellow of the Royal Institute of British Architects, first entered the Council in December, 1895. Mr. Gelder was returned to the Hull School Board in 1892, at the head of the poll, and was during the triennial term Vice-Chairman of the Board and Chairman of the Property Committee. Among the public buildings which he has designed are the Market Hall and the James Reckitt Free Library.



## Correspondence.

To the Editor of THE BUILDER.

## THE RECOGNITION OF THE ARCHITECT.

SIR,—One of the most eminent citizens of one of our largest provincial cities recently laid the foundation stone of an extensive public building. The affair was reported in the morning papers, about two columns in length, including the names of everybody but the architect.

A traveller in building specialties called on me to ask who was the architect. He said he had called on the gentleman who laid the stone, but he did not know the name of the architect. My informant told him that the architect usually presented a trowel and mallet to the gentleman who laid the stone, when the gentleman said the architect did so, but he had no idea what his name was.

Comment is needless.

W. H. W.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—XX.

LIGHT: REFRACTION.

THE laws relating to the refraction of light are practically the same as those of sound, to which we have already alluded. According to Descartes' law applying to single refraction, when a luminous ray is refracted in passing from one medium into another of a different refractive power, it is found that (1) Whatever the obliquity of the incident ray, the ratio which the sine of the incident angle bears to the sine of the angle of refraction is constant for the same two media, but varies with different media; (2) The incident and the refracted ray are in the same plane, which is perpendicular to the surface separating the two media.

Ganot draws attention to some interesting effects produced by refraction. In consequence of refraction, bodies immersed in a medium more highly refracting than air appear nearer the surface of this medium, but they appear to be more distant if immersed in a less refracting medium. A common experiment to illustrate refraction is as follows:—A coin is placed in an empty basin, and the position of the eye is so adjusted that it is just not visible. If now, the position of the eye remaining unaltered, water be poured into the basin, the coin becomes visible. An effect of refraction is that objects at a distance appear higher than they are in reality.

One of the most practical applications of this branch of optics is refraction by means of prisms. Light rays falling obliquely on windows in such a position are merely projected (though not entirely) on to the floor of the basement immediately in front of the windows. By arranging a series of prisms, however, it is possible to catch the rays, and by refraction to divert them so that they shall be thrown or projected to any required position. In this way refracted light can be concentrated on any particular part of the dark basement, or, conversely, the rays may be scattered. The method of fixing pavement lights is an illustration of this. It will be obvious, however, from a consideration of Descartes' law above referred to, that to get the maximum result with such prisms, they must be accurately set so as to present a face of definite position; for if that be not done, the reflected rays will be directed to a place which may not be required to be specially lighted—as, for example, the ceiling or side walls. Indeed, the whole problem of lighting by refraction ought to be considered from a purely scientific standpoint, and inasmuch as the position in which the prisms are to be fixed, and the shape of these latter, must, in a scientific view, depend on local circumstances, every case should be specially considered. The student will see that a kind of prism highly suitable for one position will not do for another. Not long since we had occasion to examine a "pavement light" which was of a very unsatisfactory character. We found that the reason it "did not act" properly was that the setters had tilted it slightly away from the building, or the tilting might have been due to the subsidence in the pavement. Be that as it may, the prisms were throwing the refracted light partly on to the ceiling of the basement and partly to the vertical wall of the building against which it was set.

This reminds us that in setting up a "pavement installation" care should be taken that the prisms shall have free play direct into

the basement. The common idea seems to be that the prisms ought to refract the light on to white glazed bricks, or something of the kind, which, in their turn, reflect it into the interior of the room. To get rid of, or minimise, the loss of light due to this circumstance, ingenious methods have been devised from time to time by sloping the ceiling of the basement towards the pavement prisms, &c. Of course, such a method can only cause the refracted light from the prisms to be sent on to the sloping ceiling, where to get the best effects there certainly should be reflectors placed. In other words, the light instead of being directed against the blank wall in front of the prisms, as in a well, and thus to a large extent cut off, should be brought forward into the room. However, we have no intention of discussing the relative methods which different firms adopt. One of the most perfect with which we are acquainted is a combination of pavement lenses (or prisms) with a prism screen. In this method, instead of throwing the rays of light direct to the rear of the basement room, the pavement prisms throw them downwards on to what we may call the prism screen, which in its turn bends, by refraction, such rays as may go through the pavement light. It may be argued that the light rays having to be refracted twice lose much of their intensity by the time they find their way into the basement. But, it should be remembered, that, in any case, refracting pavement prisms only direct the light diagonally, and, as before mentioned, by usual methods much light is cut off, or has to be utilised by reflection. In the last article it was shown that more light rays were stopped by reflection, even in the parabolic reflector, than by the dioptric method, and we quoted instances of this by giving the relative light-power required by the two methods. So that, in our own minds, we have no doubt that, for basements, such a prism screen as we have alluded to is highly efficacious. It is constructed of a number of small parallel prisms cast or cut (we do not know which) on the underside of a plate sheet of crystal glass. These prisms do not refract the light from one to the other, and on finally arriving at a "projecting" (master) prism, throw the concentrated refracted light into the room, but each prism refracts the light direct into the room.

Of course, in the construction of prisms for the purposes mentioned, the glass must be as pure as possible. Bearing in mind that the density of the medium through which the light rays pass practically controls the direction in which they are bent, it will be evident that the common varieties of glass must be approached with much circumspection. In another connexion we have shown that reflected light undergoes three operations, part being directly reflected, part being diffused, and a third part being absorbed. In the refraction of light it will be readily understood that, if much obstruction be offered to the passage of light, the rays obstructed must conform to the rules laid down in regard to reflection. Consequently, if the glass employed in the construction of prisms contain much impurity, both reflection and refraction go on in the same prism, only that the light reflected goes the wrong way. We mention this because the student should be enabled to judge between a good glass and a bad one. Glass is made of silica, but the number of forms in which that compound occurs are so numerous that advantage could easily be taken of the fact, and prisms of little value constructed accordingly. Silica is *fer se* an infusible substance, though we believe it has recently been melted in the arc furnace, in small quantities. That is not at present a practicable method of reducing it, however, and we can only consider the ordinary business methods employed in melting it. These are the admixture of lead or an alkali with the silica, which promote fusion. The more alkali, or lead, the more readily is the whole reduced to glass, and the more easily, it may be added, is the whole cast into prisms and the like. The student will see that, in producing a cheap series of prisms, the manufacturer has a wide scope. It is easy to make a glass prism, but it is much more difficult to be assured that it is of the best composition for transmitting light. The following methods may be advised in this connexion. Hold the prism up to the light; if it becomes surrounded by a dark zone, decreasing in intensity towards the centre, it will be of little use. If, on the other hand, it is bright all round, the prism will, no doubt, be good. Again, examine the surface of the

prisms; if they reflect the light perfectly and not in an uncertain undulating manner, that shows they are well made. But, if the reflected light is dull and is wanting in uniformity in intensity, the prisms are inferior.

The student ought to remember also, that in addition to refracting light, such prisms, by reason of their smooth surfaces, reflect light. Now, if the glass of which the prisms are made is so placed that the rays of light striking the surface is at right angles to them (the light rays), practically the whole of the light is refracted as well as the particular prism employed can do it. But, if the surface presented to the rays is oblique with reference to their direction, there must also be a certain amount of reflection from that surface, which is diffused and lost so far as interior lighting is concerned. Indeed, it is perfectly possible to so construct a prism that the bulk of the light rays shall be reflected from it. In all cases some light must also be refracted; the chief object, from a lighting point of view, is to increase refraction and decrease the possibilities of reflection.

Unless each case is studied in a scientific spirit, it is better that the surface of the prism presented to the light rays shall be dull rather than polished; but if all care be taken in regard to the placing of the prism in proper position, then it is better that that surface of the prism shall be as highly polished as possible, so as not to obstruct the light rays attempting to pass through it. The best glass for the purpose is what is commonly known as "crystal," in which the purest form of silica is used, with as little flux (and that of the purest kind) as possible. Problems connected with the refraction of light for practical purposes must always depend on the quality of the refractor.

## OBITUARY.

MR. GEORGE PLUCKNETT.—We regret to record the death, on Sunday last, at the age of eighty, of Mr. George Plucknett, who was for thirty-seven years the treasurer of the Builders' Benevolent Institution, of which he was also a liberal supporter, and of which he was elected President in 1860. Mr. Plucknett was formerly a partner in the firm of Messrs. Cubitt & Co., of Gray's Inn, but retired from the firm several years ago.

## GENERAL BUILDING NEWS.

THE PROPOSED ENLARGEMENT OF WAKEFIELD CATHEDRAL.—On the 4th inst. a meeting was held in the vestry of Wakefield Cathedral to consider the proposed enlargement of the cathedral as a memorial to the late Bishop Walsham How. Archdeacon Donne, who presided, submitted plans of the proposed enlargement, and said they now proposed to take the initial legal steps to carry out the plans. A certain sum of money was in the bank, and the amount actually promised was about 7,000*l.* They understood that the sum in hand was sufficient to start the work, provided it was carried out in sections. The whole project was a large one, and, although 20,000*l.* might complete the fabric, it was not likely that all the fittings and furnishings would be met by that sum. The first alterations would be the removal of a portion of the eastern end of the cathedral to make room for what would form the crypt of the new building, which would consist of a chapter-house with vestibule. On the north side of the crypt would be a boys' vestry, and on the south side a men's vestry. A resolution approving of the additions to the cathedral and the alterations to the graveyard consequent thereupon, as shown in the plans, was carried.

TOWER, ST. PETER'S CHURCH, NORTH HAGBOURNE, BERKS.—St. Peter's Church, North Hagbourne, was erected eight years ago, and the tower was then built to a height of 30 ft. Now the altitude of the tower has been increased by another 15 ft., and the decoration of the interior of the church has been finished. The architect was Mr. A. Waterhouse, R.A., and the builder was Mr. Kirby, of Milton. The chancel only was decorated in 1894, but now the nave has been decorated, and made to correspond with the chancel. A new pipe organ, with nine stops, has been purchased from Messrs. Ingram & Co., and placed in the chancel.

CHURCH, GAYWOOD, NORFOLK.—The parish church, Gaywood, has been reopened after alteration and repair. Mr. H. J. Green, of Norwich, was the architect, and Mr. R. Chapman, of Hanworth, was the builder.

ST. CUTHBERT'S EPISCOPAL CHURCH, COLINTON, EDINBURGH.—This little church, which was built in the year 1889 from designs by Dr. Rowand Anderson, has recently been enlarged, furnished, and decorated. Originally the church consisted of a nave, chancel, and tower. The additions include a transept on the south side, an organ chamber adjoining it, and a bell chamber on the top of the tower. The transept



opens upon the nave through two red stone pointed arches—the church being fifteenth-century Gothic—and increases the accommodation by fifty sittings, the total number of places being now about 180. The decoration of the church has been carried out from designs by the architect, Mr. Powell, Lincoln.

**VESTRY, SUNNINGHILL, BERKS.**—It is proposed to erect a new vestry at the north-west end of this church, according to the plans prepared by Messrs. Morris, of Reading. The total cost will be about 1,000l.

**VESTRIES, ST. MARTIN'S CHURCH, LINCOLN.**—Two new vestries have been recently erected on the north side of St. Martin's Church, Lincoln. The one for the clergy is 12 ft. square, and the one for the choir is 10 ft. by 22 ft. They are built of Ancaster stone. The architect was Mr. C. F. Bodley of London, and the builders were Messrs. H. S. and W. Close, of Lincoln.

**ST. MILDRED'S, BREAD-STREET.**—The repairs and alterations to this church have been carried out by Messrs. Dove Brothers under the superintendence of Mr. Charles Innes. The vaults beneath the church have been cleared to a considerable depth, and the coffins and human remains have been removed. The new floor is constructed of concrete and steel girders.

**MEMORIAL CHURCH, KENSAL RISE.**—A church is to be erected at Kensal Rise to the memory of the late Dean Vaughan. The committee which has been formed to carry out this object met at the Church House last Saturday, and the drawings of their architects, Messrs. J. E. K. & J. P. Cutts, were approved, and the work is to proceed at once. The building will seat 750 persons, and is estimated to cost 7,500l. By the desire of the committee a tower and spire is shown on the design, but this is not included in the estimate, but is to be erected as a separate section of the work.

**BOARD SCHOOL, NORTH SHIELDS.**—The formal opening of the new Board school in Lovaine-place West, North Shields, took place on the 9th inst. There are eight class-rooms in the school, the present buildings forming only two-fifths of the entire scheme. A cookery school is arranged on the second floor. The plans for the buildings were prepared by Messrs. Marshall & Dick, and the superintending architect was Mr. C. T. Marshall. Mr. Joseph Elliot, North Shields, was the contractor; Messrs. Emley & Sons, Newcastle, carried out the heating arrangements; Messrs. Doulton, London, supplied the terra-cotta; and Mr. Moore was the clerk of works.

**BOARD SCHOOL, LEEDS.**—A new infants' school in connexion with Hunslet Carr Board School was opened on the 10th inst. Situated in Woodhouse Hill-road, on a site containing 3,649 square yards, the new premises will accommodate 530 children. Mr. W. S. Braithwaite was the architect. On the sides of a central hall are class-rooms, and on the fourth cloak-rooms. One large room provides for 110 children, and in a smaller one sixty babies may be cared for. The total cost, including site, has been 6,300l.

**BOARD SCHOOL, RUTHERGLEN, GLASGOW.**—On the 5th inst. the new school recently completed for Rutherglen School Board at Eastfield was opened. Mr. Ferguson was the architect. The school has been built to accommodate 604 children at a cost of 7,500l.

**RESOLVEN BOARD SCHOOLS, GLAMORGANSHIRE.**—A new Board school has just been opened at Resolven. The new school is intended to accommodate 528 children, and is divided into two departments (mixed and infants). There is a central hall, 7 ft. long by 30 ft. wide, into which opens seven class-rooms intended for the mixed department. In the infants' department there is a large school-room, and two class-rooms, with communication to the central hall for drill instruction. There are separate cloak-rooms to each department, and on the first floor there is a board-room. The whole of the rooms are heated with Musgrave's hot-water system. The floors are constructed of pitchpine wood blocks to the class-rooms and central hall, and the cloak-rooms and corridors of granolithic cement paving. The contract was entrusted to Mr. Elias Morgan, Landore. The architect is Mr. J. Cook Rees, of Neath.

**SCHOOL ENLARGEMENT, RAVENSTONE, LEICESTERSHIRE.**—It is proposed to enlarge the National schools at Ravenstone, from plans prepared by Mr. T. H. Fosbrooke, architect.

**COTTAGE HOSPITAL, CLACTON.**—The foundation stone of the Clacton and District Cottage Hospital was recently laid. The erection of the hospital was undertaken as a memorial to celebrate the Diamond Jubilee of the Queen. Mr. J. W. Martin provided the plans, but the Committee decided to erect only half of the building at present. Messrs. Everett & Sons, of Colchester, are the contractors. The portion of the scheme now in hand will provide for two wards of four and two beds respectively.

**NEW STREAM LAUNDRY, WREXHAM.**—A new steam laundry has been erected at Wrexham, under the superintendence of Mr. Walter Slater, architect, of Wrexham.

**FREE LIBRARY AND TECHNICAL SCHOOLS, MIDDLEWICH.**—The Victoria Technical Schools and Free Library, erected at Middlewich in commemoration of the Queen's Diamond Jubilee, were opened on the 5th inst. The new buildings are on the site

of the old Naylor House. Plans were prepared by Mr. R. T. Worth of a library and schools to cost about 2,000l, and of baths to cost 1,200l, together with a caretaker's house. The new buildings are English Renaissance in style.

**CONSERVATIVE CLUB, PUDSEY.**—The foundation stone of a new Conservative Club was laid at Pudsey on the 5th inst. The site of the old club, together with land adjoining, is being utilised, and one section of the building is to be finished and made ready for occupation before the old premises are interfered with. Messrs. Holton & Fox, of Dewsbury, are the architects. On the ground floor will be a reading-room and a conversation room, with a lecture-hall in the rear, which will seat 300 people. A billiard-room, with accommodation for four tables, will be situated upstairs, a refreshment bar separating it from a smoke-room and a couple of card-rooms. Provision is made for a supper-room in the basement, where also will be retiring-rooms for performers using the stage in the lecture hall. In course of time it is intended to utilise the land occupied by an adjoining building for the erection of caretakers' rooms.

**PREMISES, BRISTOL.**—New premises are being erected by Messrs. Ford & Canning in Baldwin-street, Bristol. The premises are to be known as "Canada House." The first portion of the block has already been built, and the remainder, which will occupy the circular corner, is to be built in a way into Queen Charlotte-street, is expected to be ready for occupation by the end of the coming spring. The materials used for the front are Cattybrook face bricks with dressings of orange rubber brick and freestone. The roof will be of slate. The floors consist of basement (to be used as a bonded cellar), ground, first, second, third, and attic. The architects are Messrs. Gintell & Bond, of Bristol, and the work is being carried out without the aid of a contractor. Messrs. Ford & Canning's own men being employed, under the superintendence of a building manager. The cost of the whole block will be about 10,000l.—*Western Press.*

**MECHANICS' INSTITUTE, HARTWISTLE, NORTH-YORKSHIRE.**—It is intended to erect new premises for the Mechanics' Institute in the main street. The plans adopted by the Committee were prepared by Messrs. Oliver & Dodgson, Carlisle. The contracts have been let to Mr. Isaac Watson, Hartwistle. The buildings to be erected will include reading-room, recreation room, billiard-room, library, and committee-room on the front, with a public hall and dressing-rooms at the rear.

**FACTORY, BRISTOL.**—It is stated that Messrs. Bayer & Co., corset makers, of London and Bath, have purchased several acres of land near Stapleton Road Station, Bristol, for the purpose of erecting a stay factory and about eighty workpeople's dwellings. The cost of the factory, which has already been commenced, is expected to be about 10,000l. The plans have been prepared by Mr. F. Gardiner, architect, of Bath, and the work has been entrusted to Mr. A. J. Beaven, of Bedminster.

**CLOCK TOWER, BELPER.**—On the 20th ult. the clock which has been placed in the new tower at Messrs. Strutt's Mills, Belper, was set going. The tower, which has a total height from the top of the 12 ft. 6 in. is of terra-cotta. The tower itself is 72 ft. 6 in. high, and is built upon the top of a portion of the mill which stands 70 ft. high. Messrs. Stott & Son, Manchester, were the architects, and the work has been executed by Messrs. Walker & Slater, contractors, Derby, and the general foreman was Mr. Otter. The clock itself, which has no dials, is of 6 ft. diameter, has been erected by Messrs. Smith, of Derby.

**COTTAGE HOSPITAL, WOKING.**—A new hospital (the Victoria Cottage) is being erected at Woking by Messrs. J. Harris & Son. The architects are Messrs. T. Allen & Son, Adelphi, London.

**LIBERAL CLUB, KEIGHLEY.**—This building has just been opened at the junction of Devonshire and Scott-streets. The entrance hall and vestibule are laid with mosaic marble leading up to the bar. Thence one corridor runs in a westerly direction, and gives admission to the news-room, the junior smoke-room, the library, committee and music-rooms on the Devonshire-street side; and the card-room and general smoke-room on the opposite side. The rooms fronting to Devonshire-street measure 16 ft. 4 in. by 15 ft. each. Beyond the bar, and at the end of the southerly corridor, is a billiard-room. On the first floor overlooking Scott-street living rooms for the curator are provided. The principal room is a social-room or central hall, with large gallery and platform. The size is 41 ft. by 37 ft. and the room is estimated to accommodate 800 persons. The architects of the building were Messrs. John Judson & Moore.

**TECHNICAL SCHOOL, LOWESTOFT.**—On the 4th inst. the new Technical School, which has been erected at a cost of about 7,400l. by the Lowestoft Corporation, was opened. The new building was designed by Mr. G. Leighton, architect, of Ipswich. The main entrance is from Clapham-road, through vestibules, to the entrance hall with the attendant's office. The corridor, 9 ft. wide, runs the whole length of the building. It is lighted from both ends and from the centre, and, in addition, by a large window on the grand staircase. A stair case gives access to the rooms of the first floor, and there is space for arranging specimen cases. The accommodation on the ground floor for science teaching pro-

vides two lecture-rooms, 26 ft. by 25 ft., and 24 ft. by 20 ft. These two rooms are divided by a revolving shutter, and are intended to be thrown into one for public lectures, meetings, &c. In connexion with these rooms is the preparation-room. The practical physics room is 27 ft. by 20 ft. The chemical laboratory is 30 ft. by 25 ft. The woodwork shop is 25 ft. by 26 ft., and the cookery school is 21 ft. by 22 ft. The principal's room is large, and could be used as a committee-room. The art-rooms are situated on the first floor. The room devoted to the teaching of building construction, machine construction, and for some advanced subjects, by 22 ft. The girders throughout have been specially designed by the architect. The heating work, on the low pressure hot-water system with radiators and coils, has been executed by Messrs. W. J. Brooke & Co. The general contractor has been Mr. Arthur Bedwell, of Lowestoft.

**PROPOSED THEATRE, HARROGATE.**—It is proposed to acquire land in Chapel-street, Harrogate, upon which to erect a theatre and opera-house. Plans of the buildings have been prepared by Messrs. F. A. & S. Tugwell, of London and Scarborough, architects. The cost of the land, buildings, and furnishings is estimated at 14,000l. The building will have seating capacity for about 1,100 people.

**FISHERMEN'S INSTITUTE, GORLESTON.**—The Jubilee memorial building erected by the Royal National Mission to Deep Sea Fishermen in High-street, Gorleston, for the purpose of an institute, was opened on the 11th inst. The new building is to take the place of the old Bethel on Pier Walk. The building will provide, in addition to the lecture-hall, a reading-room, library, gymnasium, coffee bar, &c. The building is of red brick construction, with a circular observation tower at the north-west angle. It was designed by Mr. S. Rivett, architect, and built under his supervision.

**NEW LUNATIC WARDS, LEWISHAM INFIRMARY.**—The new lunatic pavilion in connexion with Lewisham Infirmary, which was opened on the 10th inst., has just been completed. It is a one-story building, situated westward of the Albert Ward, and isolated. The pavilion is arranged to accommodate male and female patients. The entrance is built in an arched recess, from which two doors lead into the interior, where the large male ward, built to hold eight beds, is on the left hand, and the female ward, of similar capacity, on the right. Between the two wards and placed near the entrance, are two padded rooms for male and female patients respectively. At the end of the main men's ward the kitchen and attendants' watch-room is arranged. In close proximity is the acute ward for cases of more than usual difficulty, while beyond all, divided from the main building by a short vent lobby, are the bath-rooms and sanitary arrangements. The women's section is arranged on a precisely similar plan. Although the building will be lighted with gas for the present, it has been fitted throughout with an electric light installation in readiness for future local developments. Mr. Robert Williams, of Lee, is the architect.

**BRIGHTON SANATORIUM.**—In reference to this building, mentioned on page 439 of our last issue, Messrs. E. H. Shorland & Brother (Manchester) ask us to mention that the large wards of this building are warmed and ventilated by means of their patent "Manchester" stoves with descending smoke flues, which have been largely introduced lately in a good many buildings of the same class.

## SANITARY AND ENGINEERING NEWS.

**WATERWORKS, BEDWORTH.**—On the 5th inst. the foundation-stone of the water tower was laid by Mr. William Johnson, C.C., the Chairman of the Bedworth Parish Council. At the ceremony a silver trowel was presented by the engineer, Mr. H. Bertram Nichols, of Birmingham. The works are being carried out by Mr. Amos Jenkins, of Southwell, Notts, whose contract amounts to 9,700l.

**PROPOSED NEW BRIDGE OVER THE CLYDE.**—For some time negotiations have been going on with reference to a proposal to build a new road bridge over the Clyde near Carbarren, about a mile and a half from Wishaw, to give facilities for communication between Wishaw and Larkhall. The Middle Ward District Committee of the County Council have instructed Messrs. Crouch & Hogg, C.E., to prepare the necessary plans.

**THE TYNE PIERS.**—On the 10th inst., Mr. James C. Stevenson presided over an adjourned special meeting of the Tyne Improvement Commissioners, held in the Commissioners' Offices, Newcastle. The meeting was convened to consider the report from Sir J. Wolfe Barry and Messrs. Coode, Son, & Matthews on the tenders received for the reconstruction of the North Pier and to take such action in the matter as might be deemed necessary. Two plans had attracted the attention of the Commissioners. The first plan, A, proposed to rebuild the pier on the site of the present structure, with foundations down to the shale. Plan B was to build the pier in a straight line with the land portion of the existing pier, leaving the sea end of the present wall standing until the new pier was completed, and then to dismantle it as far as low-water mark. Finally, it was unanimously resolved, we understand, to accept the tender of Sir John Jackson, Limited, Westminster, to rebuild the pier on plan B at a cost



estimated upon the schedule prices of 440,950*l.* 12*s.* 2*d.*, the contractors agreeing to complete the work in five-and-a-half years.—*Newcastle Leader.*

**WIVENHOE SEWERAGE.**—In the recent open competition for schemes of sewerage, sewage disposal, and water supply for the district of Wivenhoe, Essex, the schemes submitted by Messrs. Sards & Walker, civil engineers, Nottingham, have been selected as the best, and adopted by the Council.

**THE REBUILDING OF KEW BRIDGE.**—Another special meeting of the Middlesex County Council was held on the 14th inst., at the Guildhall, Westminster, Mr. D. M. Littler, Q.C., C.B., the chairman, presiding, for the consideration of this matter. Surrey has already decided to proceed with the work upon the basis of the tender of Mr. E. Gibb, of Stockton, Yorks, at 150,000*l.* The Council voted for the report, and the contract was given to be sealed, but notice of an amendment was given to increase the width to 55 ft.

## FOREIGN.

**FRANCE.**—It is announced that the house and pictures left by Gustave Moreau to the State, as a kind of Art Museum, will be opened to the public next spring. The house (No. 14, rue de Laroche) contains seven hundred pictures, three hundred drawings, and about five thousand engravings, which are in process of classification. The Chamber of Deputies has had under consideration a proposal to vote 10,000 francs towards a monument in Paris in honour of Puvion de Chavannes. The Société Nationale des Beaux-Arts (the "New Salon") has started a subscription with the same object. "The monument which is to be erected in memory of Charles Garnier is to be placed near the Opera House, at the intersection of rue Aubert and Rue Scribe. M. Pascal has been commissioned to design the architectural portion, which will consist of a pedestal adorned with bas-reliefs, and will support the bust of Garnier by Carpeaux. There is talk of enlarging the celebrated building of the Institut de France, and transferring the Mazarin library to some other place, in order to find space for another audience-hall and a gallery of busts.—M. Paul Mondit, Professor of Construction at the Ecole des Beaux-Arts, has been appointed Government architect in charge of the Guimet Museum.—The rebuilding of the Conservatoire de Musique is again talked of, as it is no longer large enough. It is expected that it will be rebuilt on the site of the Caserne de la Nouvelle France, Faubourg Poissonnière.—At the Louvre a new sculpture gallery is to be opened to contain the works of Carpeaux. The Government has demanded a fresh credit of 380,000 francs for repairs to the Palace of Versailles and of the Grand and Little Trianon. The works, which are to be completed before 1900, comprise the restoration of the facades towards the park, the strengthening of the floors of the Galerie des Glaces, and the reconstruction of the Orangerie.—M. de Saint Marceau has completed the model for the statue of Alphonse Daudet, who is represented seated on a rising mound in an attitude of reflection, leaning against the trunk of an olive tree. Some old wood-carvings which decorated the Hotel of the Military Governor of Paris, in the Place Vendôme, have been removed to the Louvre; they are valuable work both for curiosity and fine execution.—M. Cassier Bernhart has been appointed architect to the Opera-House, in place of the late Charles Garnier.—The works at the Opera Comique are going on rapidly. The decoration of the interior has been commenced; the ceiling by M. Benjamin-Constant has been finished; the auditorium; the paintings of M. François Flameng have found their place in the grand staircase; and those of MM. Olivier-Merson, Toudouze, and Raphael Collin, will shortly follow.

## MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—The Blackman Ventilating Company (London) have opened new show-rooms and offices at the Colonnade Passage, Birmingham.—Messrs. J. H. Sankey & Son (cement, lime, brick, &c., merchants, 4 Cannon Town) have purchased the business of Messrs. A. Grogan & Co., of Plumstead, Woolwich Arsenal, Bexley Heath, and Plumstead, which will in future be carried on by Messrs. Sankey & Son at the same centres.

**THE RHIND LECTURES IN ARCHEOLOGY, EDINBURGH.**—The first of the series of lectures on archaeology for this year was delivered on the 7th inst. in the Lecture Hall of the National Portrait Gallery, Edinburgh, by Mr. Balfour Paul, Lyon King-of-Arms, whose subject for the course is "Heraldry in Relation to Scottish History and Art." The lecturer dealt mainly with the grammar of heraldry. As we knew it, heraldry was a product of European civilization which could not be traced back further than the eleventh century, if so far. The origin of the custom of bearing coats-of-arms, no doubt, arose from the necessity of identifying knights, whose form and features were totally concealed by their armour on the field of battle. Generally speaking,

it was not till the end of the twelfth century that arms as hereditary distinctions of a family came into notice.

**THE LONDON SCHOOL BOARD AND WAGES AND CONTRACTS.**—The weekly meeting of the members of the London School Board was held on the 10th inst. at the Board-room, Victoria Embankment, Lord Reay in the chair. Lord Morpeth brought a report of the Works Committee with reference to the proposal to insert a schedule of wages in forms of contracts where such a schedule was not now inserted. The matter was discussed at a previous meeting of the Board on a recommendation of the Committee. "That where, in any well-defined and extended trades, evidence is furnished to the Board of a recognised rate of wages accepted between employers and employed, such rate of wages be filed in the head offices of the Board, and be inserted in the contracts in like manner to the schedule of wages inserted in the building contracts of the Board." The words "well-defined and extended" were struck out, and the following words were added, on the motion of Mr. Costelloe:—"And that where no such agreed rate of wages is proved to be in existence, the Board shall, in any case in which it may seem desirable, insert a schedule of such wages as they require to be paid." The matter was afterwards referred back to the Committee for further consideration. The Committee now repeated their original recommendation with the omission of the words "well-defined and extended," and Lord Morpeth, the Chairman of the Committee, accordingly moved, "That where, in any trades, evidence is furnished to the Board of a recognised rate of wages accepted between employers and employed, such rate of wages be filed in the head offices of the Board, and be inserted in the contracts in like manner to the schedule of wages inserted in the building contracts of the Board." Mr. Macnamara moved as a amendment to add the words, "and that where no such agreed rate of wages is proved to be in existence, the Board shall, in any case in which it may seem desirable, insert a schedule of such wages as they require to be paid." A long debate followed. On a division the amendment was rejected by 24 votes to 23. The motion was then agreed to.

**NEWPORT ENGINEERS, ARCHITECTS, AND SURVEYORS.**—The first annual dinner of civil engineers, architects, and surveyors of Newport was held at the Westgate Hotel on the 9th inst. Mr. W. Hitchcock presided, the vice-chair being occupied by Mr. W. S. Smyth. The loyal toasts having been honoured, Mr. Smyth gave "The Town and Trade of Newport and District." Mr. T. Canning first Newport Master Builders' Association, also responded, and spoke of the great progress which Newport had made in the last thirty or forty years. Mr. L. H. Hornby also responded. Mr. R. A. Forsyth gave "The Visitors." The Town Clerk (Mr. A. A. Newman), the Clerk of the Peace for the County (Mr. H. Stafford Gustard), and the President of the Newport Medical Society (Dr. Egerton Williams) responded. The toast of the evening, viz., "The Professions of the Civil Engineers, Architects, and Surveyors," was given by Mr. W. Lyndon Moore, and responded to by Mr. R. H. Haynes (the Borough Engineer), Mr. John Braine, and John J. Swallow. The Chairman and Vice-Chairman were toasted, and a special expression of thanks was accorded to the joint hon. secretaries, Mr. W. Tanner and Mr. W. C. Kirby.

**MORECAMBE MASTER BUILDERS' ASSOCIATION.**—The first dinner of the Morecambe Master Builders' Association was recently held at the Clarendon Hotel. Mr. W. J. Cross, President, occupied the chair. After the dinner, the usual loyal toast having been honoured, the President called upon Mr. Baxter to propose "The Master Builders' Association." Councillor Baxter congratulated the President on the successful establishment of the Association, and expressed a hope that it would have a lifelong success. To him the new Association was one of the most representative gatherings of the trade of Morecambe that he had ever sat at table with. Mr. Cross, in responding, gave a few facts as to the formation of the Association. The members had a system of mutual insurance under the recent Compensation Act. "The little differences that had arisen between employers and employed from time to time had so far always been settled, and the object of the Association was to provide a proper basis of understanding between masters and men. The employers wanted to see good wages paid for good work. They had run which were equally binding on masters and men, but some of them did not at present meet altogether with the approval of the employers. He instanced the apprentice rules in his own trade. He had twelve plasterers, and if he wanted to make twelve more it would take him thirty-five years. Mr. J. Escome proposed "The Architects, the Surveyors, and Clerks of the Works," coupled with the names of Messrs. J. Wright (of Messrs. Austin & Paley, Lancaster) and James Marshall (of Messrs. Marshall Brothers). Mr. S. Wright, in responding, said that the influence of such an Association as that would be to improve the quality of the work done by its members. They had often heard of the builder who did not know how to do a good job, but he commended to their earnest consideration

the builder who did not know how to do a bad job. He also begged the master builders to use their influence with their apprentices to induce them to attend the building construction classes at the Technical School. Mr. Marshall also briefly replied. Mr. R. B. Abbott proposed "The Town and Trade of Morecambe." Councillor John Gardner responded.

**WAYSIDE CROSS, ECKINGTON, WORCESTER.**—At Eckington, recently, was unveiled, after restoration, the ancient wayside cross. The base and a portion of the shaft remained, and for many years past these had been utilised as a sign-post. When the Diocesan Architectural and Archaeological Society were considering how to celebrate the Jubilee last year, the Rural Dean of Bredon, the Rev. R. R. Duke, suggested the restoration of village crosses, and the Society undertook the restoration of that at Eckington. Accordingly, the upper portion of the shaft has been renewed, and a stone cross added in place of the old sign-post. The work has been carried out by Messrs. Martin, of Cheltenham, from a design by Mr. W. J. Hopkins, of Worcester, the Diocesan Architect.

**MEMORIAL MONUMENT, BARNSELY.**—A memorial, subscribed for by the members of the Licensed Victuallers' Defence League of the No. 2 (Yorkshire) District, and friends, in memory of the late Councillor J. W. Sykes, of Barnsley, was unveiled on the 10th inst., in the Cemetery, Barnsley. The monument, which has cost about 200*l.*, has been erected by Messrs. Oxley, Barnsley, from designs submitted by them in competition. It is Gothic in style, and is 16 ft. in height. The monument is surrounded by a twisted iron railing.

**FIRE AT A BUILDER'S YARD.**—At Boughton Monchelsea, Kent, last week, an outbreak of fire occurred on the premises of Messrs. Wood & Son, builders. Messrs. Wood's premises are situated in the centre of Boughton village, and nearly the whole of the material which was on hand, as well as machinery, was destroyed. The fire broke out in the engine-shed.

**FOUNTAIN, COLEFORD, GLOUCESTERSHIRE.**—At Coleford, on the 10th inst., a permanent memorial of the completion of the 60th year of the reign of her Majesty the Queen was unveiled. The memorial takes the form of a drinking fountain. Mr. A. H. Pearson, of Ross, was the architect, and the execution of it was placed in the hands of Mr. E. Wilding, builder.

**GOLDERS HILL ESTATE.**—We are glad to learn, from a letter addressed by Mr. Henry Harben to several of the daily papers, that from December 1 till further notice this estate, consisting of the gardens and park of the late Sir Spencer Wells, will be open to the public from 8 a.m. till dusk, the County Council having undertaken the control of the property between these hours until such time as it can be formally transferred to them.

**THE "FITZROY PICTURES."**—These pictures, designed in a broad decorative manner by Mr. Heywood Sumner, and other eminent decorative artists, for the pictorial decoration of schools, mission-rooms, &c., are being followed by a new series in small form, for school prizes, reward-cards and children's rooms. They are mounted on card with a ring for hanging.

**SUBSIDENCE AT NORTHWICH, CHESHIRE.**—A portion of the London-road, measuring 30 yards long by 8 yards wide, subsided at Northwich on the 15th inst. The sinkage, which at first amounted to some 10 ft., gradually continued during the afternoon until water began to enter the lowest depths, thus showing that the depression was on a level with the bed of the River Weaver, running close by. The premises occupied by Messrs. Taylor & Sons, contractors, were on Tuesday 4 ft. out of the perpendicular, and had to be vacated. The "Bridge" Inn also suffered considerably, large fissures appearing in the walls. The town bridge, which was in process of demolition, had to be reopened, and another temporary road formed, as the London-road was quite impassable. The subsidence is one of the most serious yet experienced in the Cheshire salt district.—*Daily Mail.*

## CAPITAL AND LABOUR.

**HEREFORD BRICKLAYERS' STRIKE.**—The bricklayers' strike in Hereford, after a dispute of eight months' duration, has come to an end. Recently, a delegate from London (Mr. Jeffrey), representing the Operative Bricklayers' Society, visited the city, and requested Mr. W. P. Lewis, the President, to call a meeting of the Master Builders' Association. The meeting took place at the Mitre Hotel, and after some argument it was arranged that the delegate should see the members of the Association, and ultimately matters were satisfactorily settled. Among other things it was agreed that walking time to the work should be paid for after the first mile and a half (instead of the first mile); that mess-room should be provided for men on all jobs where practicable (the last two words being added to the previous condition); that the wages should be 7½*d.* for the foreman or employer; that six months' notice be given to terminate any of the rules, such notice to expire on November 1; and that the rules as now agreed upon remain in force for two years from this date. The local officials on behalf of the brick-



layers, we understand, refused to sign the agreement; but it was taken up to London, where it was signed by Mr. John Hatcher, the London Secretary of the Operative Bricklayers' Society, and therefore it becomes binding. At a meeting of the bricklayers a telegram was received from London stating that the strike must now be considered at an end, and that the men were at liberty to proceed to work at once. It is said that the delegate came down from London without any invitation on the part of the master Cuilders.—*Herald Times*.

**MASONS' STRIKE, SWANSEA.**—A strike among the stone masons employed at the new East Dry Dock, Swansea, is in progress, owing to members of the Stone Masons' Union refusing to work along with non-union men.

**THE BUILDING AND ALLIED TRADES.**—Exceptional briskness prevails in the building trades and allied industries. The monthly report of the Amalgamated Society of Carpenters and Joiners shows only 423 unemployed members out of a total of 56,101, equal to about  $\frac{1}{14}$  per cent. whilst in Manchester there are only fourteen out-of-work members out of a total of over 2,000. It may be added that the local branches are seeking an advance of  $\frac{1}{4}$ d. per hour in wages, but by the working rules of the district no change in wages can be made without six months' notice being given. The only districts where trade is reported as bad are in the Colonies. In South Africa, this is attributed to the unsettlement that was caused as a result of the Jameson Raid, the development of industrial operations having been considerably retarded by that occurrence. Not only is the supply of workmen greater than the demand, but the rate of wages has been reduced, men who were formerly earning 6*l.* a week now only making 5*l.* From Capetown, Cape Colony, Durban, and Natal, the report from the society's officials is that the district is "overstocked" with workmen. Other districts report trade as bad, the only exception being Pietermaritzburg.—*Manchester Evening News*.

**BARRY MASONS' LOCK-OUT.**—The dispute between masons and masons at Barry, which has resulted in a lock-out extending over two months, has been settled in an amicable manner. Members of the Central Executive of the Operative Stonemasons' Society have visited the district, and after consulting with the local branch, secured an interview with the Master Builders' Association. That conference has taken place, and the dispute was settled on the understanding that the lock-out notices are withdrawn; the men will undertake to waive the question of Union or non-Union labour. Both parties are consequently agreed, and work will be resumed on all local contracts as prior to the commencement of the dispute.

#### LEGAL.

##### ACTION BY A BUILDING OWNER AT SEAFORD.

THE CASE of Hutchings and others v. The Seaford Urban District Council came before the Court of Appeal on the 10th inst., on the appeal of the plaintiffs from a decision of Mr. Justice Channell, sitting as Vacation Judge, on September 22 last, refusing to grant a mandatory injunction restraining the defendant Council until the trial of the action or further order from committing any trespass on the plaintiffs' land at Seaford, and from opening the soil or laying pipes thereunder. The case was reported in the *Builder* of September 24 last. The first plaintiff, Mr. A. B. Hutchings, is the owner of a building estate at Seaford (the other plaintiffs being tenants of his), and on August 23 last the defendants served Mr. Hutchings with the following notice:—"Take notice that the Urban District Council for the Urban District of Seaford, under and by virtue of the powers in behalf conferred upon them by the Public Health Act, 1875, intend to carry a sewer into, through, or under certain lands in the district of which you are the owner, that is to say across the lands situated between Sutton Grove and Eastbourne-road, in the parish of Seaford, from points A and B, as shown on the enclosed plan." The defendants' Surveyor made the following report:—"The cesspool into which the houses in Lidoon-road drain has again filled and requires emptying. I have had great difficulty in finding a place for the disposal of its contents, and have had to cart it nearly half a mile. I consider it very necessary that the property should be drained into the main system, which is now laid sufficiently far to connect in Sutton-road." On August 29 the defendants acted on their notice, entered on the plaintiffs' land and commenced their works there. Section 6 of the Public Health Act, 1875, enacts, "Any Local Authority may carry any sewer through, across, or under any turnpike road, or any street or place laid out as or intended for a street, or under any cellar or vault which may be under the pavement or carriage-way of any street, and after giving reasonable notice in writing to the owner or occupier (if on the report of the surveyor it appears necessary) into, through, or under any lands whatsoever within their district." The plaintiffs' contention was that defendants had not given him a reasonable notice, and also that the report of the Surveyor did not show that it appeared to be "necessary" that the sewer should be carried through the plaintiffs' land. Mr. Justice Channell

refused to grant an injunction, saying it was a case for compensation if the defendant was liable. At the conclusion of the arguments, the Master of the Rolls said that it was not a case for a mandatory injunction, and the only order that the Court could make would be that the costs should be costs in the action.

#### EMPLOYERS' LIABILITY.

ON the 10th inst., before Judge Emden in the Lambeth County Court, a carpenter named John Lord, of Camden-road, claimed under the Employers' Liability Act, 50*l.* from F. Colwill & Co., builders, of Clapham-road, for personal injuries received through a fall from a ladder which was alleged to be defective. The defendant appeared and conducted his own case, stating at the outset that he could not afford to employ a solicitor. It was stated by the plaintiff that whilst standing on a pair of steps, fixing a pipe casing, the bottom rung gave way, and he fell backwards and sustained injuries which caused him to be out of employment for seven weeks. The defence was that the plaintiff used the wrong class of ladder for doing work of that kind, and was guilty of negligence in so doing. Judge Emden said the case was one of "common law nature, and it raised the question—Can a workman select such plant as he thinks proper, and if he then meets with an accident can he claim damages, whether the plant he has chosen is suitable for the work or not. Plaintiff's case was that the ladder was rotten, but his evidence upon that point was extremely unsatisfactory. The defence was that suitable ladders were provided if the plaintiff had asked for them. In his opinion the plaintiff selected a ladder which was not suitable, and an employer could not be made liable for accidents to workmen who used such plant. The action therefore failed, and must be dismissed with costs.—Mr. Chester Jones, counsel for the plaintiff, here drew the judge's attention to Section 1, Sub-section 4 of the Workmen's Compensation Act, which empowers the court to assess damages after an employer has been declared not to be liable under the Employers' Liability Act. Sub-section 2, paragraph (c) of the same clause, provided that the employer shall not be liable "if it is proved that the injury is attributable to a wilful misfeasance or wilful misconduct on the part of the plaintiff." The counsel argued that the plaintiff had not been guilty of serious and wilful misconduct.—His Honour upheld this contention, and said that the plaintiff was entitled to 5*l.* compensation under the Workmen's Compensation Act, and that sum would be deducted from the amount which the defendant was entitled to on account of his decision under the Employers' Liability Act.—*Morning Advertiser*.

#### WORKMEN'S CLAIM FOR DAMAGES.

AT the Southampton Borough Police Court, on the 7th inst., before the Mayor and a full bench of magistrates, Messrs. Jenkins & Sons, of 25, Portland-street, builders, were summoned by Robert William Hedger, Clarendon-road, under the Employers and Workmen Act, 1875, for 4*l.* 3*d.*, damages sustained for loss of time (six hours). Mr. E. R. Ensor appeared for the plaintiff, and Mr. Lampport for the respondents, who denied liability. In opening the case, Mr. Ensor said he had been instructed by the Bricklayers' Union, and the question in dispute was not so much the 4*l.* 3*d.* as the application of certain rules made between the masters and men. These rules provided that the employer should give one hour's notice, or one hour's pay, except in cases of misconduct, and the employer should give the same amount of notice or forfeit one hour's pay. The rules further provided that on the termination of the engagement the wages due should be paid at the expiration of such notice, or walking time allowed if sent to the yard. Mr. Ensor then called Robert William Hedger, who stated that he was a member of the Bricklayers' Union, and a copy of the rules produced had been given him. On September 23 he was working for Messrs. Jenkins & Sons at the new Isolation Hospital at 84*d.* per hour. At four o'clock on September 23 witness saw the foreman, and gave him one hour's notice to leave. Witness went on working until five, when he went to the office for his money. The foreman was not there, and after waiting until 6.30 witness went home. He returned to the works the next morning at 6 a.m., but was unable to get paid until twelve o'clock, when he received 2*l.*, which was in respect of a full week's work up to 5.30 on the 23rd. Witness told the foreman he was entitled to another six hours' pay, 4*l.* 3*d.*, up to the time he had received the 2*l.*, which was now claimed. By Mr. Lampport: He denied that he and thirty other workmen went out on strike that day. Witness gave notice to leave because another man got the "sack," but he knew nothing about the other men having done the same. It was a fact that this strike or suspension of work was reported to the Bricklayers' Society, who ordered the men to go back to work, and witness was one of a minority who refused to do this. It was loss of time he was claiming for, not walking time. If he (witness) had been working all night, and had given an hour's notice in the middle of the night, he should have expected to get his money. By Mr. Ensor: He was working under the rules,

and if the employers had wished to make any limitation they could have done so.

George Teale, president of the local branch of the Bricklayers' Society, was called to prove the original rules, but Mr. Lampport objected that there was no contract between the man and Messrs. Jenkins, and that there was no legal obligation to abide by the rules.

The rules were then admitted, with a notice of Mr. Lampport's objection, and the clauses applicable to the case read.

Mr. Lampport, in defence, contended that the claim was unfair and unreasonable. It was, he said, a good thing that associations of employers and employed should come to arrangements, but there was nothing in this claim of the character of fairness and reasonableness. Mr. Lampport read correspondence which had taken place between defendants and the Secretary of the Union, which went to show that the latter did not countenance the action of the men in coming out, and expressed regret to the defendants that the men had acted in that way. He submitted that by the men's own showing there had been misconduct in the fact that the men had struck, and it was unreasonable to suppose that the contractors of great public works such as these should keep enough money on the ground to pay off all their men at an hour's notice whenever it might be given. There was no unreasonable delay on the part of the men in such a construction as the plaintiff sought to put upon the rules could be allowed.

The Magistrates retired for nearly three-quarters of an hour, and on their return the Mayor said the majority of the Bench had decided in favour of defendants.

Mr. Ensor applied for a case to be stated, and it was granted.—*Southampton Times*.

#### PARTY WALL STRUCTURES: IMPORTANT POINT UNDER THE LONDON BUILDING ACT, 1894.

THE CASE of Hobbs, Hart, & Co., Limited, v. Grosvenor, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Chitty and Vaughan Williams on the 16th inst., on the plaintiffs' appeal from an order of Mr. Justice Channell, sitting as Vacation Judge on October 19. The case was reported in the *Builder* for October 22 last.

The facts are shortly these.—The plaintiffs are the owners of No. 76, Cheapside, and the defendant was the building owner and interested in No. 75 (the premises adjoining), upon the site of which he is about to build. The plaintiffs' premises were constructed to support great weights, such as safes, strong-rooms, &c., and therefore it was necessary or essential that the party wall should be kept in good condition, and that the plaintiffs should know what was going to be done with it. On September 2 last the defendant gave the plaintiffs notice under Section 90 of the London Building Act, 1894, of his "intention to execute the following works on the said party structure, which might on survey be found necessary or desirable." The works were the raising of the party wall to support a new party structure under Section 88 of the Act. The plaintiffs contended that a notice in such general terms was bad and a violation of the Act, as it did not state specifically the particular work the defendant intended carrying out. The defendant, on the other hand, contended that the notice was sufficiently specific, and that he was perfectly willing to show the plaintiffs the plans of the proposed building so soon as they were received from the District Surveyor, and to give such other information as they might require. Mr. Justice Channell refused to grant an injunction, as he had great doubts as to whether the notice was bad at all, although he had some doubt as to whether the notice was sufficient to authorise the defendant to raise the wall. In the result it was arranged that the defendant should give an undertaking not to act upon the notice which turned upon the raising of the wall without giving the plaintiffs a further notice, and also agreeing to extend the time for the plaintiffs appointing a surveyor, and no order was made on the application for an injunction, the costs to be costs in the action. From this decision the plaintiffs now appealed.

Mr. Mulligan, Q.C., and Mr. Gatey appeared in support of the appellants; and Mr. Alexander, Q.C., and Mr. Jessel represented the defendant (respondent).

Mr. Mulligan argued that the notice given by the defendant was much too general in its terms, and that the plaintiffs were entitled to some particulars of the proposed work.

The Master of the Rolls: What do you ask here?

Mr. Mulligan: An injunction to restrain the defendant from proceeding in this matter except in accordance with the provisions of the London Building Act, 1894, and from pulling down, underpinning, raising, or interfering with the party wall.

Lord Justice Chitty asked if the works had commenced. Mr. Mulligan replied that they had not, and, according to the notice, they would not do so until December 27 next. There were ex-gratis conferred on an adjoining owner under the Act which the notice in question and the order of Mr. Justice



Channell deprived the plaintiffs of. The first was that an adjoining owner had a right to give a counter notice within four weeks after he received the building owner's notice. That was impossible for the plaintiffs having regard to the present notice. Secondly, the adjoining owner might, if the building owner was doing nothing wrong and gave a proper notice, at once consent, so that there might be no expense or difficulty in the matter in the appointment of surveyors. Thirdly, the adjoining owner might withdraw the Act, where the notice was sufficient, and told him what the building owner was going to do, obtain security, which was a very important matter in this case, having regard to the construction of the buildings. Fourthly, the defendant was not entitled to pull down the party-wall until he had given the proper notice, and that had not been dealt with by Mr. Justice Channell. The learned counsel then referred their lordships to the different Sections and Sub-sections of the London Building Act, 1894, bearing on the subject.

Mr. Alexander, for the defendant, submitted that the notice given was sufficient. It was impossible for the defendant to say what the condition of the party-wall was when the building was pulled down, or whether it would be in a state of repair, strengthening. If his learned friend's argument was correct, the result would be that the defendant would have to pull down his building and the ground remain vacant for two months after the building was pulled down.

Lord Justice Chitty: It strikes me, looking at the notice, that it is impossible for anybody to consent to it.

Lord Justice Chitty: One of the things the Act provides for is that the adjoining owner may consent, and you ought to provide him with such a notice that he can consent to it.

The Master of the Rolls: Yes, you ought to give him the opportunity of assenting.

Lord Justice Vaughan Williams suggested that the defendant ought to tell the plaintiffs what the alteration to the party structure would be.

After some further discussion, the Master of the Rolls said the case was a peculiar one, and he suggested that the defendant should amend his notice telling the plaintiffs generally what he was going to do, and the sort of building he was proposing to erect, and that the other side should have a stay for a month in order to enable them to give their counter notice. All that could be done before December 27, and no time would be lost then.

Both Mr. Mulligan and Mr. Alexander assented to this course on behalf of their respective clients, and that the defendant should amend his notice within seven days. It was also arranged that each party should pay their own costs and that all proceedings should be stayed.

## MEETINGS.

FRIDAY, NOVEMBER 18.

*Institution of Civil Engineers (Students' Meeting).*—Mr. C. Lightfoot on "The Production of Liquid Air, and its Application to Chemical and Other Industries." 8 p.m.

*Sanitary Institute (Lectures for Sanitary Officers).*—Professor H. Robinson on "Sewerage and Sewage Disposal." 8 p.m.

*Geological and West of Scotland Technical College: Architectural Craftsmen's Society.*—Mr. J. Little on "Conditions which Render Houses Unhealthy." 8 p.m.

*Twente Institute of Architecture, Science, and Art.*—Dinner, Grand Hall of the Royal Hotel, Union-street. 6 p.m.

SATURDAY, NOVEMBER 19.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection at Harrison & Bucker's Brick Yard, Winton-road, Whitechapel. 3 p.m.

*Liverpool Architectural Society.*—A visit of inspection will be made to the Thompson-Yates New Laboratories of Pathology and Physiology (Mr. Alfred Watchhouse, R.A. architect), at University College, and the School of Hygiene, Ashton-street. The party will assemble in the Hall of the Victoria Building at 11.15 p.m.

MONDAY, NOVEMBER 21.

*Royal Institute of British Architects.*—Mr. F. Bond on "The Comparative Value of Documentary and Architectural Evidence of English Cathedrals." 8 p.m.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—(1) Inspection at the Metropolitan Cattle Market, Finsbury. (2) Demonstration of Disposed Meat in the Parkes Museum, at 8 p.m., by Dr. W. A. Bond.

*Society of Arts (Antarctic Lectures).*—Professor Vivian B. Lewis on "Acetylene." 8 p.m.

*Liverpool Architectural Society.*—Mr. Edmund Rathbone on "Liberalism and Conservatism in Architecture." 6 p.m.

TUESDAY, NOVEMBER 22.

*Northampton Institute, Clerkenwell.*—Mr. F. Bond on "Vicissitudes of Parish Churches." 8 p.m.

*Institution of Civil Engineers.*—Further discussion on Mr. W. Beattie Eason's paper on "Electrical Transmission of Power in Mining." 8 p.m.

WEDNESDAY, NOVEMBER 23.

*Society of Arts.*—Professor G. Forbes on "Long Distance Transmission of Electric Power." 8 p.m.

*Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).*—(1) Lecture at L.C.C. Municipal Lodging House, Parker-street, Drury Lane. (2) Mr. Charles Jones on "Scavenging, Disposal of House Refuse." 8 p.m.

THURSDAY, NOVEMBER 24.

*Institution of Electrical Engineers.*—Adjourned discussion on Professor S. J. Thompson's paper on "Rotatory Converters." 8 p.m.

*Society of Antiquaries.*—8.30 p.m.  
*Society for the Encouragement of the Fine Arts.*—Annual General Meeting. 8.30 p.m.

FRIDAY, NOVEMBER 25.

*Architectural Association.*—Mr. Paul Waterhouse on "Oriental and Bay Windows." 7.30 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. W. C. Tyndal on "House Drainage." 8 p.m.

SATURDAY, NOVEMBER 26.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection at the Sewage and Destructor Works, Ealing. 11.15 p.m.

## RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until December 26.

[1897] 24,470.—SELF-LUBRICATING SHARPENING STONES: *E. S. Masterman.*—A mixture is made of forty-five parts of argillaceous material, say, china clay, with five of a calcareous substance, such as powdered chalk, and one of fine emery or powdered flint; with that are mixed fifty parts of very fine sawdust or woody fibre, or any other similar material capable of being eliminated by friction with emery, and the paste, after having been pressed into moulds the slabs are subjected to intense heat, and steeped in oil.

26,466.—PARTS OF GAS COOKING STOVES, GRILLERS, &c.: *H. J. Fattah.*—The invention relates to making the burners, straps, or supports loose or detachable, with their ends lying within shaped seatings or pockets formed either in the stove-frame or in bridges or supports of the stove-top; for loose burners the frame of the stove is crossed by set-down bars or straps recessed to receive the burners and parts to be supported, whilst their ends are detachably connected with the stove top.

26,483.—STORING AND USING CALCIUM CARBIDE, &c., FOR ACETYLENE AND SIMILAR GAS GENERATING APPARATUS: *E. S. Bond.*—In lieu of perforated tubes are devised tubular calcium carbide and removable caps at their ends. One end of the tube is tapered so that it may be passed into the opposite end of a similar tube (on removal of the caps) to form a tubular continuation. Within the tubes is placed a lining of soft paper or other suitable material; the tubes are then loaded, and the caps are fitted on to them.

27,004.—WATER-CLOSERS AND SUPPLY APPARATUS THEREFOR: *J. Staines.*—The numerous claims comprise (a) seats of thin metal shaped to fit the basin's top rim, and also to extend within the rim, the metal being perforated and externally cam-shaped enlargement at a level connected to the basin's top rim with the middle of the front projecting forwards and the back slightly receding, and forming slots or holes along the hollow rim's bottom, with second series of holes through a higher part of the rim; (b) providing, for a series of closets or a rough passage, an underneath discharge pipe, a cistern with a ball-float supply valve; (c) actuating the ball-float supply valve by an eccentric or cam-shaped enlargement at a level connected to the float-level to receive increased movement; and (d) in a cistern having syphon discharge apparatus connecting to the syphon a small pipe formed at its lower end with a short upward bend.

27,288.—GENERATING ACETYLENE GAS: *J. Reibel.*—Gas is automatically produced by causing carbide fragments to fall into the water over their passage through a liquid which, whilst presenting an inactive quality upon carbide, prevents the wet steam from attacking the main bulk of the carbide not at once employed at the time of the working; the claim relates to an automatic contrivance which carries along the fragments by an endless series of rollers, moved by a lever which is actuated by the descending movement of the bell-shaped side-cover of the gas-holder.

27,515.—TRAPS FOR DRAIN-PIPES, SEWERS, GULLIES, &c.: *R. A. Lowe.*—The invention relates primarily to the traps for earthenware drain-pipes having an egg-shaped cross-section, but it is applicable also to gully, closet, or sewer traps; the trap's cross-section, measured at a right angle to the water-flow, is egg-shaped from one end of the trap to the other, or at least from the deepest part, or the sole of the pan to the outlet, so that the outlet may be easily and immediately connected with an egg-shaped pipe; the traps may be made of earthenware or metal, or other material.

28,179.—WATER-SUPPLY VALVES FOR WATER-CLOSERS: *J. G. Connell.*—The valve-piece closes down upon a valve-seat in the valve-box's lower part; on its upper part is a piston fitted to work loosely in the cylindrical interior of an inverted cup which is perforated in its upper surface; in the valve-piece is formed a central opening adapted to be closed by a small valve on the upper end of a spindle, the opening movement of this latter valve being limited by a stop, and holes or notches are made around the inverted cup's side and bottom edge.

28,300.—MAJOR COVERS FOR SEWERS, &c.: *J. W. Lees.*—The cover is pierced with a series of preformed radial slots or holes, and a plate, similarly pierced, is pivoted centrally to the cover's inner side; the plate may be turned, to close or open the holes, by a lever fitting on to the squared end of the pivot, which is sunk or recessed in the cover.

28,550.—HEAT GENERATOR AND FUEL ECONOMISER FOR DOMESTIC PURPOSES: *W. S. Free.*—A framework of curved bars is put in an ordinary open fireplace or register stove with its hollow facing outwards. It is claimed that by this device a considerable air space is obtained through which the heated air rapidly rises, and so generates intense heat.

28,765.—BATHS: *P. M. Staunton.*—The inventor's object is to furnish means for enabling a cold sponge bath to be taken directly after a hot reclining bath. He puts a cistern in a convenient position within the reclining bath, that the bath may fill it from the overhead supply cocks, and use it as a sponge-bath.

29,938.—TREATMENT OF WOOD TO RENDER IT NON-INFLAMMABLE AND TO PRESERVE IT: *H. F. Simpson.*—The wood, to prepare it for impregnation with a fireproofing or other solution, is first subjected to a vacuum, and then, in the condition of moist heat, and then to a medium such as water or methylated spirit, which will dissolve out the volatile and fermentable constituents from its pores, the medium or solvent being used with or without a saprophytic medium, pressure being preferably employed to enforce the action of the medium or solvent. The wood is impregnated with a solution of sulphate of ammonia, or of phosphate of ammonia, or both, and then submitted to the

action of a salt of zinc, or a salt of alumina, or both. To render it fire and water resisting, and to harden it, the wood is first impregnated with a fireproofing solution together with gelatine or size, and next impregnated with a hardening solution—viz., 3 parts by weight of sulphate of iron or zinc, 1 part by weight of sulphate of alumina, and water sufficient to make a 15 per cent. solution.

29,945.—SLATE MANUFACTURE, FIRES, &c.: *W. J. Lewis.*—The piers or jambs are built out of solid blocks of slate, hollowed, planed, and ornamented; with these are combined solid attached supports, mantel-pieces, and friezes, or separate column pillars or registers.

29,337.—MEASURING DISTANCES ON MAPS: *J. H. Gray, B.Sc.*—To provide a curvimeter adjustable for measuring distances on maps whose scales are different are contrived a spurred measuring wheel and a registering wheel; the latter has teeth around its edge, and is so arranged that the measuring wheel causes it to revolve through a space equal to the distance between two of its adjacent teeth every time that the two wheels gear together; the wheels are geared by providing the measuring wheel at calculated points with pins of various lengths protruding sideways, and by so placing the registering wheel that the pins actuate the teeth of the latter which thereby revolves; the registering wheel is graduated. For a one-inch scale a convenient size for the measuring wheel is such that its circumference is exactly one inch, when the registering wheel would be adjusted to come in contact with only one pin—namely, the longest. For each revolution of the measuring wheel, if the scale is half an inch to the mile, the registering wheel is adjusted to come in contact with two pins in every revolution—namely the longest and the next longest, situated diametrically opposite; and so on for lesser scales.

29,483.—BAND-SAWS: *F. Zeinwaldt.*—In order to reduce the weight of the saw's upper portion and to dispense with a spring or rubber buffer, the inventor contrives a light and elastic bow, to carry the saw-driving wheels, made out of strips of wood fastened together.

[1898] 1,195.—SLIDE MEASURING INSTRUMENTS AND DEVICES: *H. Kienast.*—For instruments wherein a slide moves over a graduated part on a beam other than the beam placed between the indicating slide and its adjusting slide or other retaining stop a conical or wedge-shaped part is attached to be moved transversely to the direction of movement of the slides, and to thus impart, by a comparatively large movement of its own, a comparatively small movement to the indicating slide relatively to the adjusting slide or stop; the extent of indicating slide's movement beyond any given point of adjustment on the graduated part may then be read off from a separate graduation on the conical part or on the adjusting slide's adjacent portion, opposite a mark or pointer.

2,835.—ATTACHING GLASS TILES TO WALLS OR OTHER STRUCTURES: *J. Gordon.*—The tile's underside is prepared with a backing composed of 75 per cent. of rock asphalt and 25 per cent. of best bitumen; a thin layer of the composition, when plastic or molten, is applied to the tile when heated to about 300 deg. Fahr.; then coarse sand, heated to at least the same temperature, is dusted over the composition's surface, whereby the tile is fixed on to the moist cemented surface of the wall.

13,537.—AUTOMATIC FLUSHING CISTERNS OR TANKS: *R. Henson.*—A syphon is connected to the tank by a hose through the bottom of the latter through which the longer leg may be passed and secured; a bell or dome covers the syphon, having at its top a small hole over which is fitted a turned seating, which is directly over the hole in the dome or bell, is placed a sphere or ball of India-rubber, covered with a perforated hole; the rising water in the tank compresses the air between the water in the tank and the water in the syphon, on reaching the height of the ball it floats the ball and allows the compressed air at once to escape, whereupon syphonic action ensues until the tank is empty.

13,742.—SELF-ADJUSTING GUARDS FOR CIRCULAR SAWS: *J. Anderson.*—The invention consists of a central plate or holder, to each side whereof is hinged a radial shield to form a half circle covering the saw; the front shield is jointed, so that when the material to be sawed is pushed up against it, the lower front plate doubles back and raises the guard sufficiently to allow the material to be passed beneath, whilst the back shield remains rising, and falls back when cleared into its place and covers the saw.

17,134.—PLASTER BOARDS OR SLABS FOR WALLS, CEILINGS, &c.: *J. F. Schuartz.*—The board is composed of slotted slabs of plaster of Paris, &c., and of a fabric of coarse woven wire fabric, exposed through the slots and cored by the usual mortar coating to constitute binding surfaces, and projecting beyond along the edges of the slabs or sheets for making a seamless wall or partition.

17,158.—ARTIFICIAL STONE KNOWN AS RECONSTRUCTED GRANITE: *W. Courtney.*—For an improvement of Patent 139,714, granite chips or blocks are calcined by intense heat, then pulverised, sifted, and mixed with other ingredients; for the inner portion or body of the blocks, the mixture is of, say, 100 parts of pulverised granite, 10 of ground felspar, and 40 of freiclay, with water enough to make a plastic admixture; for the ornamental face or outer skin of the blocks, the admixture is composed of, say: 100 parts granite, 30 of ground felspar, and 30 of freiclay; the inventor says: "Such a composition can be thoroughly fused at temperature from about 2,700 to 3,000 deg. F., as nearly as I am able to ascertain."

19,769.—POLISH FOR FURNITURE, &c.: *F. T. Lyle.*—To 20 oz. of boiling water is added an admixture of 12 oz. pure white wax, 13 oz. pure yellow wax, 3 dr. borax, 14 oz. distilled turpentine, and 14 oz. Castile soap.

## NEW APPLICATIONS.

October 31—November 5.

22,810, Cottrell & Napper, Cocks and Valves. 22,821, A. Mott-King, Fire-extinguisher. 22,845, Bailey & Latham; 22,922, J. E. Smith; 23,008, L. Morris; 23,390, A. Gilmer; 23,487, W. E. Patterson; and 23,508, E. W. Patterson, Acetylene Generators. 22,828, A. Latts, Arrangement and Distribution of Underground Telephone Wires. 22,836, H. Simon, Electrical Switches. 22,837, M. Birns, and 22,956, E. Lange, Saw-guard. 22,840, T. E. Markham, Bolt and Fastener. 22,841, Hayward & Owen, Expanding and Contracting Screws. 22,854, W. M. Chatterton, Shelves or Brackets. 22,861, E. A. Storor, Tool for Tapering Handle-ends. 22,863, G. W. Dolbel, Delineating Outline of Maps, &c. 22,865, G. Little, Elevators. 21,867, A. Dunskey, Decorative Treatment of Wooden and other Surfaces. 22,870, S. B. Apostoloff, Electricity Meters. 22,875, G. Vignino, Hydraulic Elevators and Lifts. 22,878, R. Smith, Lamps. 22,882, E. J. Gasse, Artificial Stone, Marble, &c. 22,887, Barkmiller & Riebel, and 22,926, Jefferys, and 22,987, A. Stuttmann, Electrical Arc Lamps. 22,885, D. F. Lucas, Composition for Coating or Painting Roofs, &c. 22,889, J. D. James



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Vagrant Wards.	Pewsey Union.	100l. 50s. and 30s.	Dec. 3
*Fire Brigade Station.	Bradford Corp.		Jan. 2

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
Granite Road Metal.	Alston/Donley U.D.C.	E. Widdowson, Contn.	
Additions to Mills, Rakecliffe.	J. Rick & Sons, Archt.		Nov. 22
Huddersfield.	Huddersfield.		do.
Two Villas, Mullion, Cornwall.	Conf. Staphord/Treasure.		do.
Hotel, Rother.	G. Butterfield, Archt.		do.
Read Works, Sycamore-road.	Birkenhead Corp.	O. Brownridge, C.E. Town	do.
Granite Spalls.	Isle of Thanet Union	C. Taylor, Minister.	Nov. 23
Sewers, Catnays-terrace.	Cardiff Corp.	W. Harter, Town Hall.	do.
Sewers, Albermarle.	Blissheim/Potts R.D.C.	W. Harter, Town Hall.	do.
Drainage Works.	Worcester Corp.	J. E. Garrett, Surv. Shire	do.
Kerbing, &c.	Hart'pool Corp.	H. C. Grimmett, C.E. Town	do.
Granite (1,000 tons).	Hilkey U.D.C.	T. Hall, 14, The Grove.	do.
Streets, Park-grove, Barkeley.		Wade & Turner, Surv. 10	do.
Additions to Schools, Chalk Hill.	Bushey S.B.	W. H. Byrnes, A. High-st.	do.
Additions to Bank, Windermere.		R. Walker, Archt. Windermere	do.
Paving Works, Lansdowne-road.	Cardiff Corp.	W. Harter, C.E. Town Hall	do.
Water Supply.	St. Germans (Cornwall) R.D.C.	S. E. Hocking, Surv. Landrate	do.
Cottage, South road, Alwinton.	W. A. Rand.	M. T. Wilson, Archt.	do.
Offices, Mount Stuart-square, Cardiff.		E. Seward, Archt. Queen's Chambers, Cardiff	do.
*Wood Paving.	Hackney Vestry.	J. L. Gregory, Vestry Hall.	do.
*Turf Paving.	Edmonton Union.	T. E. Kneller, 106 Cannon-st. E.C.	do.
Granite (30 tons).	Whitman Bessall U.D.C.	W. H. Blood, Council Office	Nov. 24
Sewers, Church-street.	Birmingham Corp.	J. P. P. Eng. Council Office	do.
Boiler House, Parc Gwyll, Bridgend.		Office & Co. Archt. 78, Craven-st. Charing Cross	do.
Paving, &c. Devon-road.	Salcombe U.D.C.	R. W. Mellis, C.E. 2nd, Oreham House, Old	do.
Sewers.	East Bedford U.D.C.	T. Collins, Sur. Council Office, Barlingham	Nov. 25
Causewaying, Earle Heaton.	Southill Nether U.D.C.	W. Darry, Eng. Council Office	do.
Sewers.	Droylades U.D.C.	W. Darry, Eng. Council Office	do.
Vagrant Wards.	Hertford Union.	H. Hartford	do.
Villa, Northland road, Londonderry.	Easty (Kent) R.D.C.	E. J. Torpe, C. & Perry	Nov. 21
Water Works.		P. R. Chubb, Archt. Council Office, Sandwich	do.
Road and Sewer, Bruce-grove, Tottenham.		Tuckett & Son, Surv. 2, Bawtchall-st. E.C.	Nov. 28
Sewer.	Storr ridge Corp.	W. F. Fiddian, Town Hall	do.
Sewers.	Thames U.D.C.	Taylor & Son, 27, St. George-street, S.W.	do.
Drainage Works.	Harrogate Corp.	S. Stood, Boro. Sur. Municipal Office	do.
Sewers, Pedmore.	Bromsgrove R.D.C.	R. E. M. Marica, Church-street Chambers, Stour bridge	do.
Cottages.	Castlecomer Union.	T. Mahony, Union Office	do.
Additions to Workhouse.	Clifden (Ireland) Union.	J. Perry, County Sur. Office	do.
*Road and Sewer, Tottenham.		Tuckett & Son, 2, Bawtchall-st. E.C.	do.
*Sixty-three Galvanised Iron (Wrought) Single Bars.	Islington Vestry.	J. J. Barber, Vestry Hall, Upper-st. Islington, N.	do.

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Form of Tender, &c. Supplied by.	Tenders to be delivered.
*Kerbing, Tar Paving, &c.	Lewisham B. of W.	Surveyor's Dept. Board's Office, Catford, S.E.	Nov. 29
*Lewisham B. of W.		The Surveyor, Town Hall	do.
Setts 800 (tons).	Edmonton U.D.C.	H. H. Whitham, Surv.	do.
Main Sewerage, Hale.	Bucklow U.D.C.	J. M. D. H. Kenzie, Surv.	do.
Sewers.	Leeds Corp.	7, Market-street, Altham	do.
*Ballif's House, Warrington.	County Boro. of Croydon	2, J. Black, C.E. 10, Park-row, Leeds	do.
Road Works.	Winchester College.	Builder's Office, Town Hall	Nov. 30
Additions to Town Hall.	Blackpool Corp.	T. Stopher, Sur. 67, High-street, Winchester	do.
Villas, Bell Hall-terrace, Halifax.		Potts & Co. Archt. 28, St. James's, London	do.
School, Rhylfawr.	Llangrücke Sch. Bd.	M. Ball, Archt. 29, North-gate, E. 1st, Ex.	do.
Additions to Schools, Denlith.		A. J. Gale, Sur. 10, Farnham, W.C.	do.
*Workhouse Infirmary.	Derking Union.	H. Percy Adams, 28, Woburn place, Russell-square, W.C.	do.
Paving, Marsh-road.	Midd'lesbrough Corp.	Works Dept. Admiralty	Dec. 2
Coastguard Station, Hastings.	Admiralty.	W. C. 10, Strand, W.C.	do.
*School Buildings.	West Hartlepool B.B.	Hartlepool, West Hartlepool	do.
Water Works.	Shorford Lines R.D.C.	J. C. Shaw, C.E. 2nd, 10, St. John's, London	do.
Hotel, Cowes, Cornwall.		Chorley & D.O.	Dec. 2
Water Main, &c.		G. Johnston, Sur. 1, Chadock-st. Bishop Auckland	do.
*Underground Conduits.	St. James (West) Vestry	Mr. Weeks, Sur. 10, Farnham, W.C.	Dec. 5
Sewerage Works, Condon.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Paving, &c. Crawley-road.	Luton T.C.	Mr. Weeks, Sur. 10, Farnham, W.C.	Dec. 6
*Supply of New, and Purchase of Old.	G. N. R. Co.	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
*New Buildings and Additions to Hospital.	City Boro. of Croydon	Mr. Weeks, Sur. 10, Farnham, W.C.	Dec. 7
*Court, Police, and Mortuary.	Cty. Boro. West Ham	Mr. Weeks, Sur. 10, Farnham, W.C.	Dec. 13
*Brick Sewers, &c.	Manchester Corp.	Mr. Weeks, Sur. 10, Farnham, W.C.	Dec. 13
Church Inn, Millbrook, Yorks.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Rebuilding Victoria Vault, Hall.	Hole & Co.	Mr. Weeks, Sur. 10, Farnham, W.C.	No date
Office, Alton-street.	Leeds Provincial Building Society	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Excavating, &c. Consett, Durham.	Consett Iron Co. Ltd.	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Rebuilding Hanging Gate Inn.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Andrews, Leam.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Road Works, Walton-on-Naze.	Exors. of R. Warner	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Rebuilding Hanging Gate Inn.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
School, Grells-street.	Salford Sch. Bd.	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Hotel, Seley, nr. Chichester.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Shelters, Park.	Beiford Corp.	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
*General Works of New Buildings.	Dundee Council	Mr. Weeks, Sur. 10, Farnham, W.C.	do.
*Steel Frame Construction, Retaining Walls, and Culvert Work.		Mr. Weeks, Sur. 10, Farnham, W.C.	do.
Café, Burlington Quay.	R. Field & Son, Ltd.	Mr. Weeks, Sur. 10, Farnham, W.C.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Borough Surveyor.	Felkestone Corp.	350l. rising to 500l. per annum	Nov. 30

T/Os marked with an asterisk (\*) are advertised in this Number. Competitions, pp. iv. Contracts, pp. iv. vii. & xli. Public Appointments, pp. xviii. xix. & xli.

Back-water Trap Valve for Basins and Sinks. 22,007, A. E. Wright, Embossing on Window and Similar Glass.	22,013, W. Mobberley and Others, Cutting Climatic Clay.	22,014, A. Miller, Safety Fittings for Roofs.	22,017, A. S. McFarlane, and 22,015, Shervels, Shield or Guard for Circular Saws.	22,023, J. Williams, Junr., and Zeale, Mortar and Similar Mills.	22,031, C. Walchner, Combined Turning and Sliding Windows.	22,032, Hotchkiss & Tucker, Coating of Metals and Composition Therefor.	22,036, Baird & Tatlock, Electrical Lamp Meter and Time Register.	22,058, W. Gelsdorf, Junr., Glass Cutting Machine.	22,064, Vandam & Marsh, Plug Switches or Wall Contacts for Electrical Circuits.	22,068, W. G. Jones, Shoring for Buildings, &c.	22,080, M. Koenen, Construction of Flat Arches or Vaults.	22,097, F. Schroeter, Cement for Fixing Tiles, Glass, Plates, &c.	22,098, F. Schroeter, Cement for Fixing Tiles, Glass, Plates, &c.	22,099, W. F. Nubball, Nuts and Spanners.	22,024, F. Bettany, Classifying Sewage by Filtration.	22,025, S. Gibson, Preparing the Surface of Earthenware or Ceramic Articles for their Decoration.	22,028, Greenwoods, Steel-yard and Similar Weighing Machines.	22,099, R. Hupler, Stocks and Dies.	22,033, J. Cockburn, Armoured Hose.	22,047, C. H. Hargreaves, Cleaning Painted Surfaces, Woodwork, &c.	22,048, R. W. McDonald, Flushing Cisterns.	22,049, E. Beckton, Sash Lines.	22,061, E. H. E. Klaus, Two-way Connecting Piece for Hot and Cold Water Pipes.	22,062, G. Nouvelle, Brick Making.	22,064, T. A. Harris, Socket for Rain-water and Other Pipes.	22,066, S. B. Apostoloff, Telephonic Fire Alarm and Time-indicating Apparatus.	22,071, A. Stoop, Pigments.	22,072, J. G. Slater, Soldering of Aluminium.	22,078, W. P. Preble, Turning or Shaping, Wood, &c.	22,087, T. T. Taylor, "A" Side-discharging Shovel.	22,090, W. J. Bosley, Brushing-out, Sewers, Drains, Water and other pipes.	22,091, T. Barnes, Cement Sliding Stay Fastener.	22,098, E. V. Bailey, Padlocks.	22,115, W. Law, Domestic Firegrates.	22,116, Black & Anderson, Safety Appliance for Window-cleaning, &c.	22,117, Clifford, Sash Fasteners.	22,121, J. Johnson, Rammers for																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Paving, &c. 22,128, J. Arnold, Paperhangers' Cutting Device.	22,159, Van der Vijghs, Artificial Stone.	22,176, J. Foster, Kilns for Burning Limestone, Cement, &c.	22,177, H. S. Tili, Fixing of Holdfast Strips in Tiles in lieu of Undercut Recesses.	22,179, H. W. Davis, Lead-lined or Lead-coated Pipes and Tubes.	22,183, W. H. Sturge, Electrical Switches.	22,192, H. Whitham, File-cutting Machines.	22,202, Wellborne & Hall, Oil Cans.	22,209, C. L. Feamside, Portable Easel.	22,222, D. Rowell, Metal Fencing.	22,232, R. J. Lee, Blowers and Draught-regulators for Domestic Grates or Open Fireplaces.	22,245, H. Reed, Safety Windows for Nurseries, &c.	22,247, R. H. Gamson, Door Fastener.	22,262, H. A. H. Moore, "Patent Cornish Stone."	22,280, W. Sermondit, cote, Sash Windows.	22,278, R. Taylor, Combined Ash-tray and Cinder sifter.	22,294, J. W. Moseley, Window Casements and Casement Frames.	22,305, Shole & Ault, Electrics for Raising Sewage, &c.	22,320, W. Sermondit, Electro-magnetic Safety Apparatus for Lifts, &c.	22,336, J. Whitehead, Floors for Passages, Chiefly applicable for the Exits of Theatres, Concert-halls, &c.	22,338, G. C. Marks, Disinfecting Apparatus.	22,332, Cistern or Tank for Water Storage.	22,341, A. Elle, Ceilings, &c.	22,342, Priest & Morrall, Brake Gear for Hoisting Apparatus.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</











# The Builder.

VOL. LXXV. No. 9912.

NOVEMBER 16, 1897.

## ILLUSTRATIONS.

House at Pangbourne: Entrance Hall.—Mr. John Belcher, F.R.I.B.A., Architect.....	Double-Page Ink-Photo.
House at Pangbourne: Entrance Front.—Mr. John Belcher, F.R.I.B.A., Architect.....	Double-Page Photo-Litho.
House at Pangbourne: View from Garden.—Mr. John Belcher, F.R.I.B.A., Architect.....	Double-Page Photo-Litho.
Church and Presbytery, St. Patrick's, Dundee.—Mr. T. M. Cappon, Architect.....	Single-Page Photo-Litho.
Proposed R. C. Church of S. Augustine, Nottingham.—Mr. Arthur Marshall, A.R.I.B.A., Architect.....	Single-Page Photo-Litho.

## Blocks in Text.

Newark Priory, Surrey.—		Newark Priory, Surrey (continued).—	
Ground Plan.....	Page 475	General View from South-East.....	Page 475
View from South.....	" 475	The East Side of South Transept.....	" 475
View from West.....	" 475	Queen's College, Cambridge.....	" 478
Cortals in South Transept: Caps or Vaulting Shafts in Presbytery.....	" 475	" The Tower, Pangbourne: Plan.....	" 484
R. C. Church and Presbytery of St. Patrick's, Dundee: Plan.....			
Page 484			

## CONTENTS.

Board of Trade Report on Strikes.....	473	Proposed R. C. Church of St. Augustine, Nottingham.....	485	Obituary.....	489
Newark Priory, Surrey.....	474	The Architectural Association Discussion Section.....	485	General Building News.....	489
Metropolitan Asylums Board.....	477	The London County Council.....	485	Sanitary and Engineering News.....	491
Northern Architectural Association.....	478	Court of Common Council.....	485	Stained Glass and Decoration.....	491
Glasgow School of Art.....	478	Metropolitan Asylums Board.....	485	Foreign.....	491
Godalming Municipal Buildings Competition.....	478	Builders' Benevolent Institution.....	485	Miscellaneous.....	491
London Improvements, Session 1897.....	478	Architectural Societies.....	487	Capital and Labour.....	492
Competitions.....	478	Books Received.....	487	Legal.....	492
" The Tower, Pangbourne.....	478	Archaeological Societies.....	487	Meetings.....	493
R. C. Church and Presbytery of St. Patrick's, Dundee.....	484	St. Andrew's Presbyterian Church, Black Rock, Dublin.....	489	Recent Patents.....	493
		The Student's Column.—Sound, Light, and Heat—XXI.....	488	Some Recent Sales of Property.....	494

## Board of Trade Report on Strikes.



THE Labour Department of the Board of Trade has issued a Blue-book containing the Report of their Chief Labour Correspondent on Strikes and Lock-outs in 1897. It is a judicial document full of carefully made out statistics, dealing only with facts and avoiding, as such a publication should, all expressions of opinion. But it is a valuable record of the extent to which strikes have interfered with labour during last year, and of the origin and results of the strikes.

Under the heading "Causes of Disputes" it is shown that the most fertile source of dispute is as to the price to be paid for labour. But while the proportionate average of such cases is still high, the tables show that it has been steadily declining during the last five years. In 1897, out of 230,267 workmen engaged in strikes, 106,293 struck on questions of wages, making 46·2 per cent. of the whole. But in 1896 the percentage of wages strikes was 58·3; in 1895, 54·3; in 1894, 72·4; and in 1893, 89·2. Last year has been a year of rising wages, and in accordance with this it is to be noticed that out of the number engaged in wages strikes 69,968 were striking for an increase of wages, as against 13,419 striking to resist a decrease of wages. The remainder of the numbers engaged in this branch of strikes, 22,906, struck for other matters in regard to wages, the nature of which is not specified. But the large proportion striking for higher wages shows the general feeling that higher wages were a probably attainable object. The figures in this table, it should be observed, are for all trades.

In spite of the tendency, which is recognised in the Report, towards rising wages, it does not appear however that so much success was obtained by the workpeople as might have been expected. In the table giving the results of strikes for all trades, it is shown that out of the 106,293 persons who struck on questions of wages, only 28,918 obtained their object; 32,480 had to give way to the employers, and 42,678 accepted "compromises." The case of the remaining

2,217 is entered as "indefinite or unsettled." But when we come to the table in which the strikes are treated *en masse* and the trades divided, the column devoted to the "building trades" gives a very different result as between employers and employed. Here we find that out of the total of strikes from all causes, 73·8 per cent. were settled in favour of the workpeople, and only 12·9 in favour of the employers; the remaining 13·3 being entered as "compromised." The statement, as far as it goes, is a formidable proof of the increasing power of the employee, though it must be remembered that 1897 was a busy year in the building trades, and labour consequently in more demand than usual.

The table comparing the causes of disputes (all trades) is instructive in some other points. The proportion of disputes as to hours of labour has risen enormously during the last five years, especially in regard to demands for decrease of hours. In 1893, out of 636,386 workpeople engaged in disputes, only 1,191 were striking on hours' questions; while in 1897, out of 230,267 engaged in disputes, as many as 52,769 were concerned with hours of labour. The difficulties raised as to the employment of particular classes of persons have also increased in a very considerable ratio; this class of disputes affecting 7,310 persons out of 636,386 in 1893, and 19,529 out of 230,267 in 1897. The total number of workpeople concerned in trade disputes has however diminished very much from 1893 to 1897, though not in a regular descending scale, the figures standing thus:—

	Total number concerned in disputes.
1893 .....	636,386
1894 .....	324,245
1895 .....	263,758
1896 .....	198,687
1897 .....	230,267

As to the means by which strikes or disputes have been terminated, it is noticeable that arbitration is going out of favour. In 1895 only 25 disputes out of 876 were settled by arbitration, and in 1897 only 14 out of 864. Direct arrangement or negotiation between the parties to the dispute has been of late years the most frequent agency of settlement, and seems to be on the increase; 498 out of 876 disputes having been settled by this means in 1895, and 624 out of 864 in

1897. This is a satisfactory indication, as it seems to imply that employers and employed are learning to look at things in a greater spirit of forbearance, and to be more ready to listen to reason and to one another.

A considerable portion of the Report is occupied by brief data of all the strikes or disputes in which not less than ten workpeople were involved, or which were not settled in a single day, divided up into trades, and with columns for place, occupation of strikers, cause or object of the strike, and a brief statement of the result. It is of some interest to run through these causes and results in the pages devoted to the building trades. From the concise statements we gather nevertheless some indication of the tone and temper of employers or employed, or both; also of the degree of interference with an employer's method of carrying on his business which the unions now have in their power and make use of; though in some cases it seems that a firm attitude on the part of the employers has had its effect. For instance, a strike of plumbers at Preston is described as (December 18—April 30\*) "for the withdrawal of a black list of men engaged in previous strikes in four shops on a question of painters being employed on glazing work"; there is no punctuation and the meaning is not quite clear, but the result is "work resumed on understanding that painters should have an equal right to glazing work; also agreed to work with non-unionists." The last very unusual item shows that the workmen were hardly the gainers in the contest. A somewhat similar result followed on a bricklayers' strike at Colchester (September 24—October 16) arising from the objection to the employment of a particular non-union man, the firm having posted a notice that no distinction should be made between unionists and non-unionists in their employ. The result in this case was—"places partly filled by non-union men, some union men resumed, agreeing to work with non-union men." In another case a little lower down in the list, however, a strike among builders' labourers at Ipswich (June 24-25) owing to refusal to work with a non-unionist, we find recorded "man joined the union;" a pretty clear case of pressure put on a man

\* The figures in brackets represent here the date and length of duration of the strike. The first date is in all cases in 1897.

to join, as the only way out of the difficulty, the strikers being thirty-three in number against this single outlier. In the case of a builders' labourers' strike at Leeds (March 9-18) arising out of refusal to work with men who were not members of the union, the result is "employer agreed to employ union men." In a carpenters' and joiners' strike at Leeds (May 24-26) arising out of refusal to work with a non-unionist, the result is that "the non-unionist was dismissed after a deputation had seen the employer." One cannot congratulate either employer or workmen in this case. A small strike at Batley (July 3-27) in which only seven men (builders' labourers) were engaged, arose out of objection to employment of a non-union man at less than union terms. Here both sides seem to have stuck to their text, the result being, "men obtained employment elsewhere, and shop was closed to trades-unionists"; at least, the apparent meaning is that the employers refused to admit trades-unionists for the future, though, like some others of the results, it is somewhat vaguely expressed, and might mean that the trades-union men were forbidden by their own body to seek work there. In the case of a small strike at Carlton (Notts) of bricklayers, stonemasons, and labourers, ten men in all (June 30—July 3), who objected to work with a non-union slater, the result is stated as "shop blocked to union men," which again is vague, and may or may not mean the same as the last quoted result. We take it, however, that they both mean that the employers would have no more union men; but it ought to have been put more clearly. The same result (if our reading is right) followed a small strike, of one day's duration, of thirteen joiners at Great Neston (January 13) to compel two non-unionists to join the union; result—"trade unionists replaced" by other men; which is as it should have been. In other cases we find clear evidence of the tyranny of trades-unionism over solitary workers. There is a strike of stonemasons at Leeds (October 2-29) to compel payment by a fellow-workman of a fine inflicted for working overtime contrary to general rules; result—"fine paid by the man complained of." We have got into the habit of reading these things as if they were matters of course; yet can anything be more thoroughly immoral and contemptible than the state of things revealed in this concise record? One man, who ought to be a free agent, chooses to do some work beyond working hours and get paid for it: sixteen men leave off all their work for two days, injuring their employer and their own families, in order that pressure may be brought to bear upon the one man to pay a fine to the union for having made a free use of his time, and been more industrious than the rest. No doubt the man was pressed by the employer, who probably told him he had better pay the fine than have all the work stopped; but such a state of things is monstrous. Again, there is a case of builders' labourers at Leeds (March 9-18) refusing to work with non-union men; result—"employer agreed to employ union men." If any members of a society in any of the liberal professions made use of such means to compel or induce the employment of members of their own body, every one would cry shame on them, and they would probably be ashamed of themselves; but workpeople may employ these tactics with impunity and self-laudation.

The majority of the demands for increase of wages appear to have been successful; but there are important exceptions. At Halifax twelve carpenters struck for an advance in wages of  $\frac{1}{4}$ d. per hour (July 6-12), but the result is "men found work elsewhere, and shop closed to trades-unionists." At Middlesbrough 120 painters struck for an advance from  $7\frac{1}{2}$ d. to  $8\frac{1}{2}$ d. an hour, and alteration in working rules (March 1—July 3); but after this long strike we read "work resumed on previous conditions." Similarly at Pudsey, where eighty builders' labourers struck for uniform rate of wages at 6d. per hour, some of the men being paid at  $5\frac{1}{2}$ d. (May 3-15); result—"work resumed at previous rates." At Scarborough 100 bricklayers struck for an advance from 8d. to 9d. per hour (August 2—March 19, 1898), but after this long waste of time and loss of money, "at a conference convened by the Mayor of Scarborough the men accepted  $8\frac{1}{2}$ d. per hour, previously offered by employers." Most of these strikes, it will be seen, were dead loss to every one concerned. But it must be admitted that these are a small minority of cases.

The strikes arising from disputes as to who should execute any particular class of work, or how and where it should be done, are pretty numerous, and give an idea of the amount of interference which employers now have to expect from their workpeople in carrying on their business; and in most cases the employers seem to have felt compelled to yield. At Leeds thirty-five carpenters struck because they refused to fit window casements made by a firm with whom the trade was in dispute (June 8-9). Result—"the employer agreed to obtain no more goods from the firm in question." This seems rather pusillanimous on the part of the employer, who apparently gave in at once; but what a system of petty tyranny this discloses! An objection to tilers laying cement flooring for wood blocks, on the part of six plasterers at St. Helens (Sept. 20—Nov. 20) has more appearance of reason in it, and one is not surprised to find that the claim of plasterers to do the work was admitted. On the other hand the strike of fifteen bricklayers in London against the employment of tilers and slaters on work alleged to belong to bricklayers (January 18—February 27) ends in "men replaced." This was probably one of the cases, which we know are not infrequent, of bricklayers persisting in a claim to do tiling work of special delicacy and which requires special hands. A strike of thirty London bricklayers (March 23-24) against the employment of a man, not a bricklayer, to cut out bricks for the insertion of wood blocks, had the result that "work was resumed unconditionally by some of the men; others were not reinstated." This was a piece of petty and spiteful interference (since there is no bricklaying skill required in cutting out bricks) which the men seem to have been unable to uphold. Forty-eight London bricklayers struck for three months and a half (July 28—Nov. 12) against tilers being engaged to lay Broseley tiles; the strike was ended by an agreement that bricklayers should do tiling work in future. The tilers would probably have done it better; and this custom of bricklayers claiming all tiling work is one which ought to be looked into. A rather exceptional case (apparently) is the strike of twenty-one plasterers of London (in November) who objected to bricklayers

doing wall tiling. The result is thus stated: "Bricklayers agreed that tile fixers should do the work on this particular contract on condition that they should do the work at a job under the same employer in London." It would appear from this that the plasterers struck on behalf of the tilers; the only reason one can imagine is that they found they could work better with them, or that a better joint job would be made, in which they were probably right. The sort of compromise accepted shows (if it needed to be shown) how completely apart these kind of strikes are from any care for the interests of the work; if the bricklayers were the fittest workmen to do it in one place they were the fittest in another; but the sole object was to get what they could. Several strikes against the introduction of ready-dressed stone on the work were successful. Sixteen stonemasons at Merthyr struck on this plea (March 24—April 3), and "it was agreed that dressed stone already in order should be fixed, but that all stone subsequently required should be dressed on the site." Again, we have fifteen stonemasons at Swansea striking against setting stone dressed at a quarry in the Forest of Dean (October 30), with this extraordinary result—"employer agreed to have stone redressed, paid 2*l.* 10*s.* to Stonemasons' Society, and promised for the future not to use stone dressed at the quarry." It appears to have been actually demanded that he should make work for the masons on the spot by having the dressed stone re-dressed. This case is really little better than blackmailing. Why an employer is not to have stone dressed at the quarry if it suits his plan of work and the circumstances better it would be difficult to say; the crime in the eyes of the stonemasons is that some work is done by other men which they would like to be paid for.

Against strikes for higher wages one has nothing to say as far as their object is concerned and as long as the demands are reasonable; every man is entitled to get as much as he can for his labour; and the fact that in so many cases the demands have been conceded is an indication that they were not unreasonable, though it may be more than questioned whether a strike is the best means of settling such a dispute. The ugly part of the documents, before us lies in the disclosure they make of the petty and selfish jealousies of one trade against another, and the vexatious interference of workpeople with the conduct of a business, not with the view of getting work better done, but with the mere desire to oust others and to secure advantages for themselves in a manner which, if it were practised by people in higher ranks of life, would be universally scorned and condemned.

#### NEWARK PRIORY, SURREY.

**A** FEW weeks ago two letters appeared in these columns\*, drawing attention to the ruins of the Augustinian Priory of Newark. We now give a ground plan of the remains, some sketches, and some additional notes on its architectural features.

The ruins stand near the banks of the river Wey, about two miles east of the village of Woking. The monastic buildings have been totally destroyed, but a considerable fragment of the church still stands,



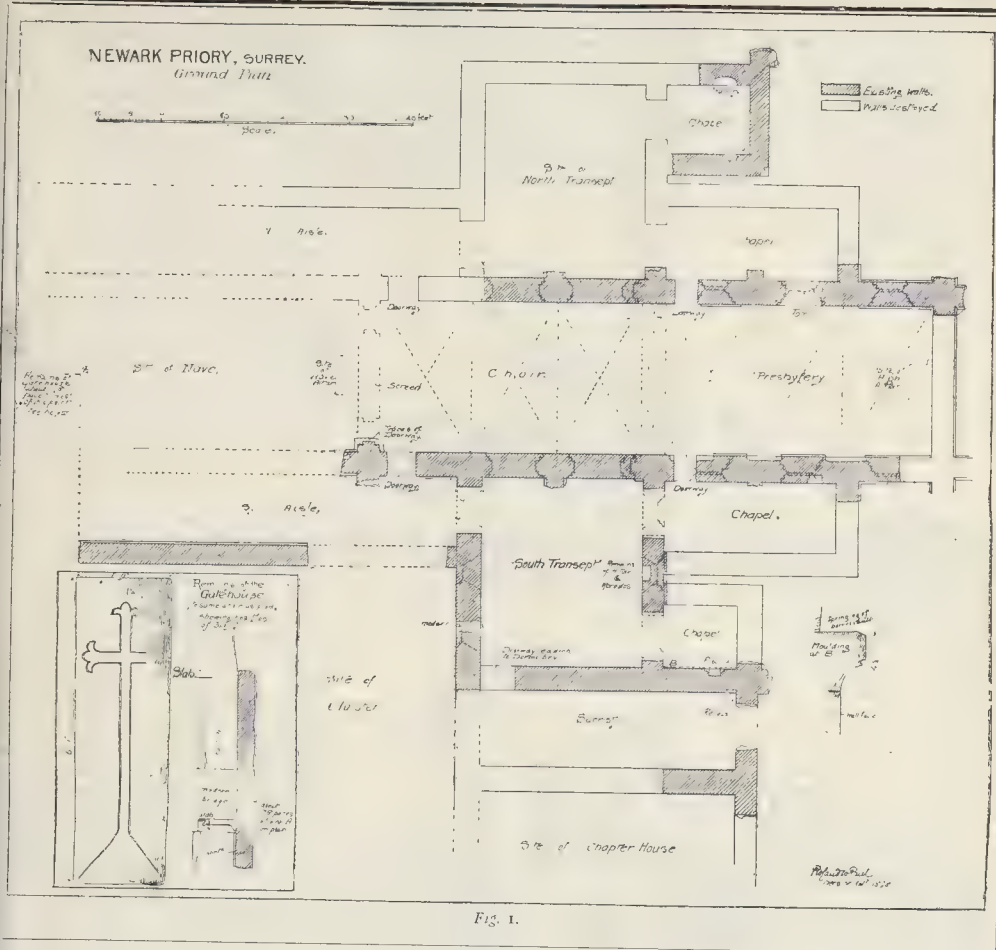


FIG. 1.

including three bays of the north side of the presbytery and two on the south side; the walls of the choir; the south transept, nearly complete, with the exception of its roof; the walls of one of the chapels of the north transept; and a portion of the wall of the south aisle of the nave. To the south of the transept is a fragment of wall marking the junction of the chapter house with the sacristy. The walls are built throughout of flint, with an admixture of tile in places. The dressings, where they remain, are of clunch, but the major portion has been removed, and what remains has suffered much from exposure to the atmosphere. Nevertheless, one or two details remain, showing that although the main lines of the building were severely simple, there was some elaboration in the details of the interior.

The nave, when perfect, was probably seven bays in length. The easternmost bay was divided from the rest by a screen, against which the nave altar was placed, and formed a small retro-choir approached by doorways in the side screens. One of these doorways still remains, and is shown in the view taken from the south (fig. 2). The screen walls here and further eastward were about 10 ft. in height. There are also some traces of one of the two doorways that flanked the nave altar in the cross wall, and the probable

arrangement has been suggested on the ground plan (fig. 1). The remaining two bays of the choir were likewise divided from the transept by stone screen walls, and above on either side were two lofty arches, formerly deeply moulded, which must have been an imposing feature of this part of the church. Against these screen walls the stalls were placed. The choir was 45 ft. long and 24 ft. broad. The presbytery was of three bays, 42 ft. long and 24 ft. broad, lighted on either side by single lancets in each bay, and perhaps by a triplet at the east end. A portion of the return wall remains at the north-east angle, and the double buttresses can still be traced. The sills of the side windows were kept high on account of the lean-to roofs of the chapels which stood against the sides of the presbytery for two bays of its length. Both the choir and presbytery were vaulted, and at the north-east angle and on the north side of the latter the caps of the vaulting shafts remain (figs. 3 and 4). The arrangement was a group of three shafts, the centre one being detached; perhaps of Purbeck marble. There was a simple chamfered plinth-mould round the inner face of the presbytery wall, and this remains fairly perfect except where the bases of the vaulting shafts have been broken away. A bolder plinth of the same kind

remains on the outer faces of the walls in the easternmost bay. This plinth was returned round the side chapels.

In the centre bay on the north side is a rough opening piercing the entire thickness of the wall. Overhead can be seen the traces of vaulting, and there is little doubt but that a tomb of importance originally stood here. The division of choir and presbytery was marked by an arch spanning the church in line with the east walls of the transepts, and a second arch crossed the church over the screen dividing the choir from the nave. Immediately eastward of the first-named arch (which was carried apparently on corbels) are two doorways, one on each side of the presbytery, which formed the upper entrances to the choir, and also communicated with the chapels flanking the presbytery. The chapels were, when perfect, 27 ft. long and 11 ft. broad. They had barrel vaults nearly semi-circular in form, and were covered by lean-to roofs. Beyond them, approached also from the east wall of the transepts, were smaller chapels about 12 ft. long, and 10 ft. broad on the south side, and 13 ft. by 11 ft. on the north side. A curious feature here is the double wall, a space of about 18 in. being left between them. The small chapel of the south transept is, judging by the

string-course at the springing of its barrel-vault, evidently of earlier date than the corresponding chapel on the north, if it is not the earliest part of the church; but the arrangement of separate outer walls dividing the chapels seems to have been the same on both sides. The position of these walls and the marks of the chapel roofs against the outer wall of the south transept are

shown on the ground plan, and in the sketch of the exterior of the south transept (fig. 5). On the inner face of this east wall, set centrally between the two pointed arches leading to the chapel, are the remains of an altar and reredos. The altar was 5 ft. long and rather over 3 feet high. About 2 ft. 6 in. above this is a recess 2 ft. 6 in. square, and on either side of this are traces of moulded brackets or

corbels. The moulding—a very delicate one—remains clearly on the south side. Doubtless there was a similar arrangement on the north transept. The south transept has remains of corbels in the angles, and traces of intermediate ones. These probably carried the timbers of a wooden roof, as it is evident that the transepts were not vaulted.

The chapels already described, east of the transepts, both had barrel vaults. Those next the Presbytery were nearly semi-circular, while those of the outer and smaller chapels were slightly pointed. Traces of aumbries and piscinae are to be found in several places, and are shown on the plan. In the south wall of the south transept, near its western end, and a little distance above the ground level, is the doorway that led from the transept to the dortor, and on the outer face of this wall are the marks of the dortor roof. South of the transept was a sacristy, the full length of the width of the transept, and 12 ft. wide. The wall at its south-east angle remains, showing the angle of the Chapter House, which was the next in order on the east side of the cloister. In the north-east angle of the sacristy is a small recess. Everything south of this has been destroyed, but digging might possibly recover the lines of the foundations, and the extent of the cloister. The south aisle wall of the nave remains for a length of 35 ft., at a distance of about 23 ft. from its junction with the west wall of the south transept. Against the transept are the weatherings of its lean-to roof. The clearstory of the nave was a single lancet. There was no triforium. The wall of the aisle is about 3 ft. 6 in. in breadth, and has no features of interest in itself, but it shows the aisle to have been 11 ft. in width. A confused mass of stone, some of it worked, immediately south of the site of the nave altar, marks the eastern respond of the (ritual) nave arcade. The arrangement here, although much ruined, might be found by judicious excavation.

At a distance of about 178 paces due west of the present aisle wall, and nearly central with the church, is a considerable length of walling composed of flint and dressed stone. This probably marks the site of the gate-



Fig. 2.



Fig. 3.



Fig. 4.

Fig. 5.



house. The wall runs north and south. At a height of about 5 ft. 6 in. from the stream is a chamfered plinth, and above this the wall in places remains for a height of 2 ft. Its length is at present about 32 ft., and on its west side is a modern bridge about 10 ft. in width. It has the appearance of being on the site of the original approach, and on its south side is a stone 6 ft. in length and 2 ft. in breadth, with a cross with fleur de lys termination and a simple "calvary" base. The stone is slightly coped in form, and is very roughly executed. We give a measured drawing of this, and a plan of the gatehouse wall, showing the present position of the slab (fig. 1). At Newark the river Wey makes a considerable bend, and at a little distance south-west of the church is the mill, which no doubt stands on an old site. The present ruins of the Priory are of Early English date, with the exception of the smaller chapel of the south transept, which appears to be rather earlier.

## NOTES.

**CONTROVERSIAL** correspondence in the *Times* during the past week, between Lord Farrer and an anonymous writer who signs himself "Thames," opens up a very pertinent question as to whether the stream principally relied upon to supply the reservoir of the London County Council's Welsh water scheme is really capable in times of drought of yielding much water. The anonymous writer says that the stream has recently been completely dried up for a month. But Lord Farrer replies that he is credibly informed that that statement is absolutely without foundation. It would be interesting to know which is right. It would have been more to the point had Lord Farrer supplemented his observations by giving the actual flow of the stream during the period in question; as it is, all we can glean is that he has been informed, by one who knows the district well, that the stream has not been "completely dried up." This is not very re-assuring when London ratepayers are being asked to support a scheme that will cost them many millions of pounds. We do not suppose that either one or the other of these controversialists are correct in their estimate of the value of the stream for water-supply purposes. The impervious strata, relieved only by joints from which the stream issues, is not calculated from a scientific point of view to hold much water in reserve during times of drought. The river can only hope for much water during rainy periods, and we are not surprised that the question has arisen. At the same time, it must be remembered that the engineer of the scheme has not suggested that the water is to be taken direct from the stream, but that it is to be stored and then drawn upon. The capacity of the storage reservoir is the chief point. If the main stream has really been "dry for a month" the reservoir will have to be of unprecedented dimensions. With past experience in front of us nobody expects a water-supply engineer to be much of a mathematician. The same correspondence deals with the flow of the Thames during the drought. That is an old tale; all are now agreed that if that river is to be chiefly drawn upon, as London grows large storage reservoirs must be made.

The Workman's Compensation Act.

WHEN this Act was under discussion in Parliament we pointed out that it was absurd to limit the application to persons who were at work on buildings not exceeding 30 ft. in height. This limitation was unjust to a large body of workmen, and was based on no good reason. We scarcely expected, however, to see the absurdity of this restriction so soon illustrated. But last Saturday a case came before the Court of Appeal which involved this point. The County Court judge had decided that as a workman was injured while employed on a building which, at the time, did not exceed 30 ft. above the street level, the employer was not liable, although, ultimately, the building would exceed that height, and this decision was upheld by the Court of Appeal. We have therefore this ludicrous result, that when a building is 28 ft. high, A may be injured and be unable to recover compensation; and that next day, when the building is 32 ft. high, B may be injured and have a good right of action. The statement of such an instance as this is sufficient to show that the Act must, in respect of buildings, be amended.

The Smoke Nuisance.

WITH the approach of winter the subject of fogs has again cropped up. Lord Middleton a very active worker in regard to the London smoke nuisance, calls attention to the circumstance that with a north-east wind the smoke now travels over nearly the whole of the county of Surrey, and may be distinctly traced for twenty-five miles from the metropolis. We do not call into question the extreme limit to which the smoke may travel, but we think that the distance mentioned must be very exceptional. "Shrubs and flowers which twenty years ago it was possible to grow at Wimbledon cannot now be preserved" from this smoke. That may be correct for Wimbledon, but it will not do for "nearly the whole of the county of Surrey." Lord Middleton would do well to confine the nuisance to the area really affected by it, where it is bad enough, in all conscience. He asks for a short Act making it necessary for every kitchen chimney henceforth constructed to be so fitted as to consume its own smoke. This, he thinks, would "work wonders." We doubt it; "henceforth" is not strong enough to do it, if we are to have any immediate relief. There are two ways of curing this abominable nuisance, caused not so much by the factory chimney, which has been much in evidence during the past few months, as by the chimneys of private houses. These are (1) to have all chimneys now altered so that they shall not create smoke, or (2) to make anthracite the only kind of coal to be used. In either case property owners would be heavily taxed. For, if the first proposition be adopted, many structural alterations would be necessary; and if the second, then nearly all the grates and fireplaces as at present made would have to be removed to make way for metal capable of withstanding the great heat produced by anthracite. Of the two, the latter would, perhaps, be the more sensible, but even the London County Council, upon whom Lord Middleton calls to do its duty, would quail before promoting a Bill of such a far-reaching character, not to speak of the question whether there is anthracite enough to be had.

The London Building Act and Party Walls.

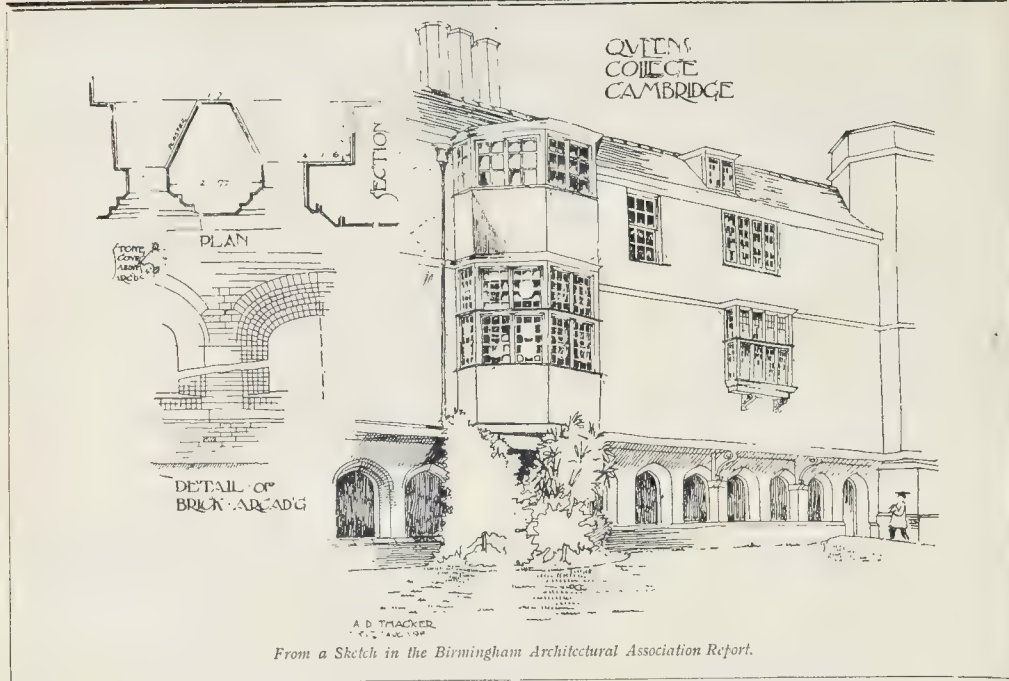
THE case of Hobbs and Grover, which came before the Court of Appeal last week, shows how important it is that notice in regard to party walls, under Section 90 of the London Building Act, 1894, should be full and complete. By that section, the owner of a party wall shall not be entitled to do work upon it unless at least two months before doing such work he has served a notice on the adjoining owner "stating the nature and particulars of the proposed work." In the case in question the Vacation Judge, though with some hesitation, thought the notice given by the defendant sufficient. The Court of Appeal thought the notice was not sufficiently clear, but in a true businesslike way intimated its defect, and so the case was settled by consent. But that fact does not make it less important, since it shows the expense and trouble which may be caused unless the notice gives the most complete indication of the work that is to be done.

Electric Traction on the Underground.

THE Committee appointed by the Board of Trade to deal with the question of ventilating the Metropolitan tunnels reported last year that the best solution would be the adoption of electric traction. The directors of the Metropolitan and the Metropolitan District Railway Companies have decided to undertake an important experiment on electric traction preparatory to introducing it on their lines. An electric installation will be laid down between Earl's Court and High-street, Kensington, which will be able to deal with trains as heavy as those now running. This particular section of the companies' lines has been chosen because on it occur some steep gradients, which will put the new system to a severe test. The present steam locomotive traffic will not be interfered with by the experiment. Between the rails there will be two parallel conductors from which the train will pick up current as it goes; when the electric system is introduced these will be permanently available. The problem of converting the present steam system into an electric one is very difficult, as in the comparatively short circuit there are twenty-seven stations, and fourteen circle trains running seven on each line. If at any time three or four trains wanted to start simultaneously, there would be an enormous demand for power from the central station, which would need to have a very great capacity to meet such emergencies, and hence it could not be run economically. The experimental work for this important trial—which, we understand, is being done by Messrs. Siemens Bros.—will be completed by the summer of next year, the consulting engineer being Sir John Wolfe Barry, with whom is associated Mr. W. H. Preece, Engineer-in-Chief and Electrician to the Post Office.

Straw in the Streets.

In the "Sanitary Chronicles of the Parish of Marylebone" for October (drawn up we presume by the Medical Officer) there are some remarks as to the increase of the practice of laying down straw in the streets in cases of illness, which it is contended should only be done under the most "exceptionable" (*sic*) circumstances, and that it ought not to be done where there is a wood pavement, which is not a noisy pavement. It is com-



From a Sketch in the Birmingham Architectural Association Report.

plained that straw is laid down more frequently in the Marylebone thoroughfares than elsewhere, in consequence of a considerable number of nursing homes or private hospitals having sprung up in that district. It is suggested that definite powers should be obtained to make regulations in regard to laying down straw in the streets, and also to deal with it before it becomes offensive. The point is worth consideration, and it was as well to draw attention to it. But we may observe that wood pavement can hardly, after all, be called a noiseless pavement, though it is quieter than macadam; and that there are cases of illness in which absolute quiet is the condition for any chance of recovery. That can only be obtained in many cases by the straw in the street, and it would be rather dangerous to give officials power to interfere or cause delay in what may be a matter of life or death. Any regulations or by-laws should be very carefully and considerably worded, at all events.

**Worcester Hop Market Improvements Competition.**  
The Worcester Hop Market Improvements Guardians had a wrangle on Friday last week over the competition designs for a new Hop Market Hotel, which ended in a very characteristic manner. Four designs were sent in, and a professional assessor had been appointed (whose name, however, is not given in the report in the *Worcestershire Echo*), who had selected No. 3. Certain members preferred and spoke in favour of No. 1. The competition was limited to Worcester architects, and the designs were sent in under motto, but it was casually admitted in the course of the discussion that the names of the architects were all known. One member spoke strongly in favour of accepting the assessor's award; but eventually the choice was put up to ballot, quite independent of any reference

to the assessor, with the result that No. 4 was selected. This affair seems to have been about as absolutely mismanaged as anything could be; and if, as we must suppose, the assessor has been paid a fee for his opinion, the Guardians have thrown that money away.

**Birmingham Architectural Association.**  
THE Report of the Birmingham Architectural Association gives a satisfactory account of the last Session, though there is a regret expressed that the sketching visits were not better attended. Some sketches made on the occasion of the visit to Cambridge are however published, one of which we reproduce; it is admitted that on this occasion there was so much to see that it was difficult to find time for sketching. The following interesting papers are down for the remainder of the Session, which commenced when the President read his opening address on October 14:—  
Nov. 25.—E. ANTONY LEES.—'The Elan Valley Water Scheme.'  
Dec. 9.—R.I.B.A. Dinner and Reception.  
Jan. 13.—JOHN BELCHER, F.R.I.B.A.—'Hampton Court' (if engagements permit).  
" 27.—GEO. H. FELLOWS PRYNNE, F.R.I.B.A.—'Ecclesiastical Screen Work.'  
Feb. 10.—BERESFORD PYTE, F.R.I.B.A.—'Ancient and Modern Buildings in Palestine.'  
" 24.—H. B. CRESWELL.—'The advantages of being an Artist.'  
Mar. 10.—H. T. BUCKLAND.—'The B.A.A. Excursion to Cambridge,' with Lantern Slides by John Ward.'

A new departure has been made by the offer of a studentship prize of fifteen guineas "for the best set of measured drawings and a design for a subject to be selected by the Council"—thus combining the study of old design with the invention of new. We may add that the Birmingham Architectural Association are also engaged in collecting information on the working of local

By-laws, with a view to approaching the Local Government Board in order to obtain a unification of the Birmingham building By-laws; a reform which must be much needed if, as we understand, a set of plans may be deposited and passed as in accordance with the By-laws in one district which would be returned as quite incompatible with the regulations of an adjoining district.

**Drawings by Puvis de Chavannes.**  
IN 1896 M. Puvis de Chavannes exhibited in a special gallery at the Champ de Mars Salon an important collection of drawings which had served as studies for his great works. The representatives of the deceased artist have determined to distribute these drawings among different public collections. A considerable number will go to the Luxembourg, and the Municipality of Paris will receive about 200 drawings for the Municipal Museum which will be organised after the exhibition of 1900, in the small art museum on the Champs Elysées. These drawings are studies for the decoration of the ceiling of the grand staircase and other portions of the Hôtel de Ville. The towns of Amiens, Lyons, Lille, Marseilles, Poitiers, Rouen, Toulouse, and Macon, will receive respectively the drawings which were made as studies for the pictures executed for those cities. The only condition imposed by the donors who have so liberally given these works is that they shall be exhibited without delay and preserved with care. This condition will necessitate, as far as the Paris municipality is concerned, the arrangement of a special room for them at the Galliera Museum, until the Municipal Art Gallery is ready.

**The Lithograph Exhibition.**  
It is a pity the exhibition of lithographs at South Kensington could not have been held in a more easily accessible place than the



rooms at the further end of the long range of machinery galleries in Exhibition-road; but the collection, when reached, is a large one, numbering about 2,250 examples, grouped according to countries in the hanging, though there is no grouping in the catalogue and no arrangement in the numbering. A good deal of the collection is of historic rather than artistic interest. It is curious to see again the fearful polished-up reproductions of portraits and popular pictures which were in the early part of the century the chief uses to which the process was put in this country, and perhaps gratifying to reflect how far we have got from that type of lithography nowadays. But the real interest of an exhibition of this kind consists in the original works; and here the French have things pretty much their own way, the highest interest of the exhibition certainly lying in the works of Charlet, Raffet and M. Fantin-Latour. The two former, the illustrators of the French people and the French army of the early decades of the century, attract by their vigorous illustration of life as well as by their handling of the material; they show how excellent a medium was lithography for free illustrative sketching of a semi-satirical, semi-pasthetic character; Raffet occasionally rising almost to the sublime, as in his remarkable figure of Napoleon watching the effect of a cavalry charge, under the title "L'œil du Maître," or the dragged grenadiers marching through "beastly weather" ("Coquin de Temps"). M. Fantin-Latour is a purely ideal artist, and his imaginary and symbolical subjects are as charming in conception as they are free or powerful in execution. Some of the modern French artists seem to have made lithography the medium for a good many weird and repellent eccentricities of symbolic design. The Germans, old and new, for the most part keep the steady path of respectable copying of pictures. The modern English works come next to the French in variety and originality. Among other things a screen of Prout's lithograph sketches of architectural subjects should not be passed over, they are so admirably illustrative of touch in lithography, in the treatment of this class of subject; Mr. Whistler's scribbly suggestions are very weak things beside these.

Mr. Finn's Exhibition.

THE card sent to us for the exhibition of works by Mr. Herbert J. Finn, at the Modern Gallery, 175, Bond-street, conveyed the impression that we were to see certain architectural pictures of two or three of our cathedrals—Winchester, Canterbury, and St. David's. The exhibition however is a miscellaneous one, and on the whole the landscape subjects are the best part of it. Some of these, such as "Incoming Tide, Barmouth" (2); "Harlech Sands" (10)—a very powerful effect; "Dawn" (42), a picture of lazy craft showing rather faintly in the misty morning light; "Harlech Castle from St. David's Golf Links" (46); "A Kentish Landscape, Evening" (45), are admirable landscape studies. The architectural subjects are numerous but for the most part treated in rather an uncertain and indefinite manner in regard to colour, surface effect, and detail, and do not rank very high as illustrations of architecture, even in a pictorial sense. For instance, in the south-west view of Canterbury, No. 61, there is

little difference in appearance and texture between the masonry of the south aisle and that of the central tower, whereas in reality they stand out in marked contrast, the south aisle having been mostly refaced in a recent period (and being rather poor work at the best), while the central tower has the rugged surface of a weatherbeaten and unrestored monument. But there are two notable exceptions to this general weakness of the architectural work, viz., the view of the north transept with the central tower and cloisters, No. 58, where the rounded surfaces and grey tone of the mouldering cloister architecture in the foreground are powerfully contrasted with the more delicate and distant portions of the building; and the drawing of the same cloisters, alone and from another point of view (60), which is a really fine piece of work in a broad and vigorous style—so much so that one rather wonders that an artist who could paint architecture in this way should have been content with the rather tame treatment of it that his other works of this class exhibit.

AN interesting exhibition of Mr. M. Falguière's works by M. Falguière has just been opened in the large foyer of the "Nouveau Cirque," Rue St. Honoré, Paris. It is, it is true, only an exhibition of studies, and the general public, who are accustomed to this artist's highly finished sculpture, may find them a little too rough for its taste. But for artists the exhibition presents the greatest interest, showing as it does the first thoughts and ideas of the sculptor hastily translated into form in the first impulse of inspiration. Among the number may be mentioned a sketch for a monument of the French Revolution, another for a monument to Daudet, a fine bust of Gambetta, the sketch for the design for a crowning group for the Arc de l'Etoile, and lastly the sketch for the statue of Balzac, which though in a very rough state, promises a much more harmonious and decorative work than the shapeless mass by M. Rodin.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### DOCUMENTARY AND ARCHITECTURAL EVIDENCE.

A MEETING of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, Mr. H. L. Florence, Vice-President, occupying the chair, when a paper on "The Comparative Value of Documentary and Architectural Evidence in Establishing the Chronology of the English Cathedrals," was read by Mr. Francis Bond, M.A., F.G.S., an Honorary Associate of the Institute. Mr. Bond opened his subject by a reference to his own researches at Waltham Abbey Church, which had led him to the conclusion that no portion of the work was of the early date assigned to it by Professor Freeman and other authorities—viz., the eleventh century; it had nothing in common with either English or Norman work of that period. Wells Cathedral was another example of what the lecturer termed archaeological aberration. Some authorities dated the nave after the west front, though the nave was far more archaic in character; Professor Willis dated the west front after the nave, but put both a whole generation too late. Many instances of similar error might be cited, pointing to some flaw in the methods of research. The cause was to be traced to the wrong estimate of the comparative value of documentary and architectural evidence. Documentary evidence consisted of the references, direct or indirect, to the history of the building in annals, monastic chroniclers, fabric rolls, registers, wills, &c.; architectural evidence was to be sought in the stones and mortar. Discussing Professor Willis's opinion

in favour of documentary evidence, the lecturer observed that few of the statements as to building operations in the cathedrals were made by contemporaries; frequently the authors lived generations or even centuries later. The ascription of the choir, transepts, and nave of Wells, as well as the west front, to Bishop Jocelin was based on a statement of Bishop Godwin, who lived in the sixteenth century, which was itself based on an anonymous MS. written in the fifteenth century. Contemporary evidence could not always be trusted. Monastic and mediæval chroniclers had likes and dislikes, and sometimes deliberately misrepresented and falsified their history—Matthew Paris's own admission was a case in point. Any good work, any fine building, erected by the unpopular, may have been attributed to the popular abbot or bishop. In this connexion the lecturer referred to Bishop Aqueblanca's work at Hereford Cathedral, which had been ascribed to Bishop Swinfield, and disproved the statement of Swapham and Abbot John, monastic chroniclers of Peterborough, that Abbot Benedict built the whole nave from the central tower to the west front. The chroniclers were not architects—their language lacked precision and definiteness; and it was dangerous to build theories on their curt and nebulous statements. They were often unintentionally misleading. The lecturer referred to a possible instance in the record in Simon's *Continuator* of Flambard's work at Durham. Again, the chronicler's statements had been applied to the wrong building—an instance at Ripon Minster was cited. There were huge gaps in the chronicles; some of the biggest works were not mentioned at all. It did not follow because there was no record of work by a particular bishop or abbot that therefore he did nothing. New evidence may be forthcoming and the prelate who had been credited with no work might turn out to have been building busily all the time. As examples of the danger of building theories on negative evidence, the lecturer showed how such theories had been upset in the cases of Wells and Worcester Cathedrals. Dates of consecration were not always of value; there were dozens of examples which had no reference to the completion of a cathedral or of any important part of it. Neither was it safe to infer that, because services commenced in a certain year, the building or any particular portion of it was completed; inferences of the kind were proved incorrect at Durham and Peterborough. The evidence, however, of contemporary fabric rolls, charter registers, &c., was of the utmost value if it could be properly read and understood. But the Latin of those documents was not easy to read; the abbreviations had proved a fertile source of error. MSS. had been carelessly copied or carelessly printed; in some cases terms had been altogether misunderstood. Striking instances of error from one or other of these causes were referred to in connexion with Lincoln, Exeter, and Hereford. Examples were further quoted showing that implicit confidence could not always be placed in mural inscriptions. Concerning architectural evidence, the comparative rather than the historical method of investigation, the lecturer considered that nowadays this class of evidence, subject to certain minor reservations, might safely be relied on. Allowance must be made for the progressive tendencies of the monks of the eleventh and twelfth centuries, for the conservatism of those of the thirteenth. The monks of Peterborough and Norwich retained their Romanesque minsters almost unaltered to the last. The canons of Lincoln, York, Lichfield, and Exeter swept away almost every trace of Norman work. The abbey church of St. Germer, near Beauvais, Oxford Cathedral, and Wimborne Minster, furnished further examples of conservatism. Builders of the first half of the fourteenth century showed reverence for old work, and refused to impair the effect of good old design; but they put their own trade-mark on the detail. Various instances were given, and some examples of "architectural forgery" referred to, as at Rochester, Durham, Galilee, and notably the gateway of College Green, Bristol, and the Church of Ottery St. Mary—buildings deliberately designed in the spirit of a by-gone style. The detail, however, prevents the student misinterpreting the evidence of the architecture. It was possible to be misled by the precocity and cleverness of a mediæval designer. Here and there a great original genius sprang forth, such as Suger's architect



at St. Denis, who gave the world fully developed and harmonised Gothic construction in 1140, two generations before the choir of Lincoln Minster was produced. St. Urban, Troyes, represented the full and final consummation of Gothic architecture, which was not reached elsewhere for more than a generation. Gloucester Cathedral afforded another instance of precocious genius. In conclusion, the lecturer expressed his conviction as to the general trustworthiness of architectural evidence, and quoted in support the authority of Mr. Barr Ferree and the late Edmund Sharpe. The architectural should be studied before the documentary evidence, and if the former conflict with the latter, then the latter should go to the wall.

The Chairman said that before they discussed the lecture, he would read a letter that had been received from the Bishop of London, as follows:—"I am sorry that a previous engagement will prevent me from attending the meeting of the Institute of British Architects on November 21. I am obliged to you for sending me Mr. Bond's very interesting paper. Its main contention is that documentary evidence needs criticism in every case, and it is obvious that internal evidence supplied by architecture is one element in this criticism. The strength of this internal evidence grows by the continued application of the comparative method. It is much stronger now than it was thirty years ago. But I do not think that its results destroy the credibility of documentary evidence, but only teach us to interpret more accurately the exact meaning of the words and discriminate between an exact and an approximate statement."

Mr. W. H. St. John Hope, in proposing a vote of thanks to the lecturer, remarked that he, although not an architect, had had the temerity to write the architectural history of one cathedral and to review that of some other churches, for his own benefit and instruction. He did not go quite so far as Mr. Bond in criticising what some of their predecessors had done. Professor Willis, it must be remembered, published his *Architectural History of Canterbury*—which was distinctly a monumental work—in 1845, and at the time he wrote their knowledge of architectural detail was not so perfect as it was to-day. Moreover, in the intervening fifty years so much had their knowledge improved that they were able to stand and look over Professor Willis's shoulders. He, for instance, had had the opportunity of going through all the account rolls and registers at Canterbury, and when he told them that the series of rolls was pretty complete from 1207 to the Reformation, and that the registers covered a similar period, they would realise that there was a great deal of matter which was absolutely unknown to Professor Willis. Touching upon Mr. Bond's reference to Hereford, he remarked that it was pointed out so long ago as 1871 by Mr. Gordon Hills that the north transept of Hereford should be assigned to Bishop Aquablanca's time rather than Bishop Swinfield's; but the old, old story still went on, like those of low side windows being for confessions or lepers, crosiers being crosses, and drains, subterranean passages uniting impossible places. When once these things got into print it was difficult to get people back to the right view. A few days ago he picked up a new book—quite a monumental work—and one of the first things he alighted upon was the description of the crossier as a cross, and a cross-legged Knight as a crusader. With regard to the wrong reference to parts of buildings, he thought they should deal charitably with their predecessors because they had not had the advantage of dealing with cases in the light of recent investigations. Look at the case of Winchester. Professor Willis quotes an entry about the beginning and finishing of a new tower in 1200. Professor Willis could not explain the passage. He had previously made up his mind that the west front was flanked by two western towers; but it did not occur to him that the shapes were very unusual. To him (Mr. Hope) it was clear that the entry referred to a single western tower, and no other. Mr. Bond had quoted Wharton. He was shockingly inaccurate, and there was a great need for revising him and consulting originals. In fact, unless they went to original authorities, they were liable to fall into errors. Mr. Hope quoted an instance of the importance of this. In collating a passage relating to the fourteenth

century works at Rochester, he found it recorded that Bishop Hamo of Hythe went down to Battle Abbey, and on a certain day in 1332 dedicated seven altars. On turning to Wharton, he found that he recorded only one item in 1332—"Many other things followed which were done by the Bishop this year, too little worthy to be noticed." It so happened that there were three crypts at Battle Abbey, and if they examined them they would find them undoubtedly of the fourteenth century, and as they contained altars it was reasonable to assume that in the new work of the church above and in the crypt there were seven altars. This record showed that the church had been lengthened eastward, and that the site of the high altar, which marked the spot where Harold fell in 1066, must be looked for further west. Touching upon architectural forgeries, the speaker remarked that there was one interesting point in connexion with the north-west angle of the Westminster Abbey cloister, where in the fifteenth century a thirteenth century capital had been worked out of the same block and at the same time as the fifteenth century one. In this connexion, too, they must look out for the re-use of old material. He came across an interesting instance at the little Church of Catterick, near Richmond, Yorkshire, where an older window was inserted which certainly could not have been built at the time the work was undertaken. He read through the contract, and nothing appeared in it relating to the old window. It was plain, therefore, that the builder had saved the window from the old demolished church, and reused it to save money. He would like to ask them whether the time had not arrived when they should have a new Rickman, and a complete revision of the architectural history of all our great churches? He had already material for some—for instance, Canterbury—and others were no doubt possessed of ample material relating to other churches. Durham could be thoroughly rewritten, for it was only recently that the whole account of the rolls, hitherto inaccessible, had been gone through at the instance of the Surtees Society. Three points should be borne in mind in preparing the stories of these great buildings. First, the Medieval mode of rebuilding; secondly, the lengthening of churches for shrines and lady chapels; and, thirdly, the curtailment of building work owing to the Black Death in 1349.

Mr. Wm. White seconded the proposal. He remarked that the reasons that Mr. Bond had given for relying on architectural evidence were very weighty. In all the difficulties which had occurred, he (the speaker) often found that the antiquarians would depend not only upon documentary evidence, whatever it might be, but they rather set aside and spurned architectural evidence altogether. There were so few comparatively, of antiquarians who had enough knowledge of architecture to draw deductions which should be drawn from architectural evidences. He would strongly press, as the lecturer had, the value of chronological and constructional evidence. There was one remarkable instance in respect to the Galilee at Durham. Documentary and traditional evidence was to the effect that Bishop Pudsey built it as a Lady Chapel; but architectural evidence went to show that it was built as a Court of Judicature when the King went to the Holy Wars. When the visitor came out of the nave of the Cathedral into the Galilee there was an inscription over the doors calling attention to the judgment—"the righteous judgements"—which should be passed in that place—the Galilee. He did not see how the architectural evidence in this instance, including the remains of the original Tribune, could be got over in any way, and it proved the value of Mr. Bond's plea for appealing to architectural evidence. And the very name given to it would itself indicate its purpose, an outer court—like the outer court of the Gentiles at Jerusalem—accessible to all alike, a civil and ecclesiastical court, in which the Judge could exercise his two-fold authority, Episcopal and Royal. There were several instances in which documentary evidence caused people to be misled in connexion with St. Albans. This was particularly so in connexion with the remnant of a fourteenth-century corbel table, the originality of which was repudiated by the clerk of the works, who appealed to history.

Mr. H. H. Statham joined in thanking Mr. Bond for his highly instructive paper, in regard to one or two points in which he desired to draw attention. He (the speaker) was entirely

in agreement with Mr. Bond's general conclusions, only he thought they ought not to forget that, after all, it was originally from documentary evidence that we got the bases for following the history of architecture. Just imagine a man of another planet being put down before the Gothic monuments of England and told to work out their history. He would make out that round-arch Gothic came before pointed-arch; he might arrive at the succession of the various styles; but he would be wholly dependent upon documentary evidence for dates. He only wished to argue in favour of giving full acknowledgment to the value of documentary evidence in the first instance, though afterwards, as Mr. Bond had shown, there were cases in which architectural evidence was very much more valuable than that afforded by documents. With regard to the controversy alluded to by Mr. Bond, concerning Waltham Abbey, he had studied the available evidence in connexion with the building, and had come to the conclusion that the theory that Harold built the nave was absolutely untenable. Yet there was no doubt that Harold did build a church at Waltham; it was described in detail; and the argument of Freeman and others was that the Normans would never have pulled it down, after it had stood so short a time, to build another on its site. But there could be no doubt that they did so, and that showed that it was not safe to argue from our ideas of what was probable or improbable in such cases.

The vote of thanks having been heartily agreed to,

Mr. Bond, in replying, remarked, in regard to the use of the Galilees, that they were undoubtedly used for half secular and half ecclesiastical purposes. As to Mr. Hope's suggestions, it was quite clear that—as, for instance, at Canterbury—the huge influx of pilgrims was one reason for enlargement.

The meeting then terminated. The next meeting will be held on December 5, when Mr. R. W. Gibson, of New York, will read a paper on "Fireproof Construction in America."

#### NORTHERN ARCHITECTURAL ASSOCIATION:

##### PRESIDENT'S ADDRESS.\*

SINCE I last had the honour of addressing you (which seems but yesterday) there has appeared in one of our professional journals an illustrated article on the architecture of this city. In my address last year, I took the opportunity (it being the Diamond Jubilee year) to describe some of the buildings, and the progress of architecture in Newcastle during Her Majesty's reign, and I then ventured to assert, that the architecture of this city was of as high a quality as will be found in any city in England (excluding, of course, London, which will compare with no place, or rather no place can compare with it). It was with some feelings of satisfaction, after reading the criticisms in the journal before referred to, that I found them so much in accord with my own. I should like here to pay, on behalf of our present and past members, a graceful tribute to the said journal, for its fair and unbiased criticisms on the architecture of Newcastle. There was one part in this criticism which was not very palatable—that referring to the domestic architecture—but I think we must admit it, with some exceptions. There is, however, one consolation, that it is possibly as good as that in many other cities.

It is astonishing what a very small percentage of domestic buildings are the work of architects. Those of our friends who reside in detached residences, and who do employ architects, are generally men of simple or quiet tastes, who allow little latitude or scope for design. They generally are possessed of a cherished ideal, a house after their own hearts, often one like a square box, with hipped roofs. This tendency on the part of some of our friends towards this modest display is perhaps better so than the other way. It may be called a national characteristic. But however plain or simple our friends desire that a house should be designed, or whatever cranks they may have in their heads either as to the plan or exterior effect, it is our duty as architects to place before them

\* Inaugural address delivered by the President, Mr. Frank W. Rich, at a general meeting of the Association on the 16th inst.



the correct course to be followed, and whether the house be simple or elaborate the design should be right, and the plan a model of usefulness.

The journal says the architects of Newcastle must look to their laurels in this respect. We have done fairly well in other walks of architecture, but in this we are not up to the mark. We have the consolation, as I said before, of being perhaps as good as our neighbours, but that is not sufficient. The criticism may be a fair one, and the stigma must be wiped out. The British public always grumble at the cost of works, whether public or private, but if any really fine design be placed before them, they are quick to recognise its merits (except members of a Government, or indeed of any elective body), and rightly applaud its author, and will gladly face the extra cost rather than a poor design.

Our students have done some work during the past session, but one cannot help feeling, that there is with our students as with those in nearly every other similar Association, a certain lack of enthusiasm. This is a matter to make us all think seriously, whether the plan we follow is a good plan. The whole of our effort in teaching our younger students at present is voluntary, and however excellent in theory a voluntary system may be, yet there is no shutting our eyes to the fact that the results are not satisfactory, and the reason is not far to seek. The task of teaching should, and no doubt does, devolve upon the men of most experience and of greatest merit, but these men are generally those engaged in active practice, whose every moment is bespoken, rendering it impossible they can do any justice to voluntary teaching. After all, it very much resolves itself into a money question; that is, the teachers of our students, or demonstrators, or whatever we may term them, should be remunerated to make it worth their while, as in other professions; and the cost involved in this remuneration should be paid by the recipients of the knowledge; and what is more important, the teachers should be architects in active practice; the information must not be taught by professional crammers.

Architecture is a living art, there are no dry bones about it; the practice of architecture carries with it the implication that any person practising it must necessarily be quite to the front in all the endless wants and details of our busy lives, taking advantage of and working into use the innumerable facts that science is for ever disclosing; and, last but not least, must possess an enthusiastic and thorough knowledge of what we may safely call our "Old Masters" and their works, the men who have laid down the foundation of our art from that Egypt of which we have lately heard so much, down through all the centuries to our own time, building up in stone and in literature a colossal and a glorious art, one which it is incumbent on us to hand down unaltered, and bettered if we can, to future generations.

It is on considerations of this nature that the littleness of our teaching becomes apparent, and the need of a better system being inaugurated. The system of pupillage (as in the apprenticeship system in the building trades) has undergone great changes in our lifetime; our younger students have, however, all the greater need for information. It is a well-known fact that one man in every ten would not hesitate to attempt to teach architecture, so much is it the custom of every man to consider architecture an art with which he is quite conversant, and therefore to attack it gaily with a light heart. He lives in a house, or has business premises, and therefore knows all about it; but take my word for it, there is no one who knows so much of architecture as your architect. He spends his life in the study and performance of it, he is in touch with the innumerable wants of the times, and conversant with the record of past centuries, to which I have before alluded. It is to such men that I would hand over our younger students. The manner in which this is to be done is the crux of the whole subject. The voluntary system has been tried, and with no particular success; there, then, only remains the other, accompanied by the financial consideration.

Our Council have given this matter some attention, and know that in this city there exists an institution, the Durham College of Science, where very many subjects of a technical nature, and in touch with architecture, can be studied; and a scheme for amalgamation with the college

in regard to these subjects is at present under consideration by our Council. But after the study and mastery of technical subjects, there remains that immense field of true architecture, embracing the absolutely useful in every day life, and the absolutely immeasurable field of imagination, or what is more generally termed the fine art of design, a quality beyond the range of examinations. I think we may leave the matter for the present with our Council, who will safeguard our younger friends, and trust that the scheme of amalgamation with the college, and also with the Institute (who, I believe, have a plan in embryo to work in conjunction with allied societies, not possibly so much in technical subjects as with the literature and history of architecture), will have the effect of putting our students upon a sound footing. But all this points distinctly to some greater scheme looming in the future—a future, I imagine, not far distant.

I should now like to refer to one or two subjects relating to our general practice. I believe we all find—and every day accentuates the position—that the inspection of our works becomes more onerous, owing to circumstances we need not stop to examine here, and the employment of clerks of works has become a necessity to meet the varying changes of practice. But the admittance of a clerk of the works is not always a blessing, and frequently brings uncalled for responsibilities upon us, who have already many to bear. The uprisings of so many local and money-spending authorities, who so frequently appoint their own clerk of the works, calls for some decided course of action from our side. Men appointed in this way are frequently so appointed on political or other questionable grounds, working very often in a spirit antagonistic to the architect, rendering his position well-nigh untenable. We all know, from long experience, that our best designed schemes may be absolutely wrecked in the performance by the carelessness or ignorance of an inspector. There is no need why any more responsibility should be put upon members of our profession by the faults of others. Therefore, the clear course is apparent; that is, the architect must appoint the clerk of works as recommended by the Institute, selecting a man who from his own knowledge is fully qualified to superintend the work. I think it prudent that the clerk of works should in the first instance be paid by the architect, who in due course is repaid by his client. I have never known a work suffer when worked on this system, but have known deplorable results follow the other course.

It will, I have no doubt, be well within the knowledge of members that there is a greatly increased vigilance on the part of the City Engineer in respect of the deposit of plans and the carrying out of buildings. No fault can be found with the City Engineer for his efforts to obtain accuracy; it is a quality much wanted, but this, like many other things, goes to make work more costly. Where we do really find a fault is in the Town Improvement Committee taking such an extended time in approving or disapproving plans. I wish here to make a strong protest, on behalf, not only of our members, but of the public generally, against the long interval of time that is lost in the Committee meeting for the consideration of plans at intervals of fourteen days, causing, in many cases, considerable financial loss to owners of property, and would respectfully ask the Committee to fall in more with the wants of the times, and place their meetings at lesser intervals. I remember some years ago, when I happened to act as your secretary, the same question arose, and information was obtained from all the chief cities of England and Scotland, as to the usual practice in these matters, when it transpired that in many of the larger cities there were much greater facilities for dealing punctually with deposited plans than appear to exist in Newcastle. This was communicated to our town improvement committee, but no good resulted. Let us hope they will no longer stand in the way of public business, but take a more enlightened view of the situation. There is not time in the present rush of business to wait a fortnight for a decision as to whether a plan is approved or is not approved. The public want their work done quickly, and in some instances, where alterations occur in the progress of building, to wait a fortnight frequently means stopping the work altogether for that period, to the manifest loss of the owner.

There is a general feeling that we are

becoming very much over-governed in municipal matters; powers are now being sought which will still further interfere with the liberty of the public in building, the strangest part of it being that the public have never asked particularly to have their liberty curtailed in this way; but there is no doubt nine-tenths of these new powers are "fads" emanating from the mind of some of our City Councillors, and generally for notoriety or elective purposes. This may be plain language, but speaking for architecture we shall find presently serious obstacles placed in the way of free design, and the architecture of our streets reduced by these by-laws to a "ditch-water" level. It goes without saying that the picturesque quality of our streets depends entirely on diversity in design—upon one building differing from the other in height, width, disposition of eaves or gables, projections or recesses, or the like. Some there may be found who advocate a design in street architecture of the "Gower-street" type, but let us hope they are few; or, to fly at higher game, some of the streets of Paris, of the Baron Haussmann period, which although more grandiose than the former, are equally unsatisfactory in their final effect. The quality of street architecture marks the history of the times, and records the sentiments of the people. We all know the circumstances under which the Haussmann buildings were erected, and we all know scores of cities where other circumstances existed, where a free people have given free scope to their qualities in design, imprinting upon their buildings a strong individuality, rendering their cities interesting at every turn we take. I should be the last to advocate the abolition of by-laws for the regulation of some building matters, but let these matters be confined to health measures and the like; let us have liberty in design. One is tempted into making these remarks by a suggestion emanating lately from our Town Improvement Committee, and there is the draft for a further bill now lying at the Town Hall, which should have the careful attention of every citizen.

While on building matters, we may say a word or two on a special kind of building very much talked of nowadays, and much needed, one popularly called a "fireproof" building; but, as a fireproof building has never yet been built, it is more correct to say a "fire-resisting" building, precisely in the same way as iron or steel safes have changed their names of late. I do not purpose here to read an essay on fire-resisting buildings, but merely to call attention to their increasing importance. This is a class of building needing all the skill of skilful men to devise, needing all our powers of observation and investigation to enable us to keep in touch with the times; it is what may be called the "modern building." Business, as we all know, moves quicker year by year, and the hazards increase. To have a large and valuable building, filled with equally valuable stock, burned down about our heads, is too serious an interference with business to be lightly endured. There is often too much theory in the design of fire resisting buildings. Fire is a terrible master; but in it Nature will have her way. It is, therefore, no use romancing in matters of construction. It is now pretty well agreed that all important or business premises, especially those abutting on public thoroughfares, should be reasonably fire-resisting, yet we frequently find them supported on the ground floor entirely on cast-iron columns or steel stanchions. The effect of this, in the event of a fire, is for the whole building to collapse like a pack of cards. It may be said architects are to blame for this, but it is not so. From what I know of architects, I do not think there is one who, in designing a building, would, on his own intuitive knowledge of design, ever produce a building standing apparently on plate glass. This iron and plate glass is one of the signs of the times, one of the phases in the history of architecture of the nineteenth century. The busy City man, in his instructions to his architect, insists on having "All Window," and he has to have it. Therefore, that material which will bear the greatest load on the smallest section must be used for supports, and for the rest glass, for which there is no substitute. But unfortunately, both these substances are dangerous under fire. Here, however, is where the skill of the architect must come in, and here we must rely on our actual experience in fires, noting the effect on building materials, and on well-conducted and authentic



experiments. I think further, that at this time it is peculiarly opportune to refer to fire-resisting buildings, for our methods of construction are altering every day, and if they are so altering they may as well alter in the direction of safety. Science has yet a large field before it; there are already many materials in the market of which we can take advantage in constructing fire-resisting buildings, but more efficacious ones are needed.

Every one who has noted the great change that has come over building material during the last twenty-five years, and over the wants of the general public, cannot, I believe, help coming to the conclusion that, sooner or later, some of our well-known and much-used materials, such, for instance, as wood and common lime plastering, will become more scarce, and may to a great extent drop out altogether. Already other materials are taking their place. Wood has two great faults (though I am bound to say it has many virtues): it is highly inflammable, and it is highly susceptible to wet and heat. Schemes have been tried with a view to render wood less inflammable, but before we can consider our buildings fire-resisting, much more must be done in that direction—that is to say if wood is used. I alluded earlier in this address to the "rush of business," and it is here where wood fails us. Our clients will not wait; they must have their buildings finished quickly, and expect them to be quite dry in no time, forgetting that the materials of which they are built are largely mixed with water. If we were like the ship-builders, we could rivet iron plates together, and there you are finished, and as dry as ever it will be; but we have not quite come to that. The wood fittings are fixed while the building is reeking with moisture, and when, having had time to imbibe a quantity of this moisture, which expands the fibres of the wood, the heating apparatus is then lighted up, and the woodwork shrinks often to a wreck. It is quite clear that, under these circumstances, neither of these materials (wood and lime plaster) meet the demands of ordinary practice: wood, on account of its inflammable nature and instability; and lime plaster on account of its wetness and slow setting. There are, as we know, many excellent quick-setting plasters in the market, but then we frequently lay this on to wooden laths, which in their turn are upheld by wooden framing. In case of a conflagration all this ends in disastrous results; indeed, we may go further, and say a great many of the usual modes of construction are wrong, for do we not imbed floor, roof, and other timbers in the walls, where they rot, and do we not form cavities between floors and ceilings, hollow partitions, skirtings, &c., which form excellent channels for fire. Much of this can be avoided by using a more solid form of construction, but this means more cost; it is the difference between good work and jerry work, and the public after all have it very much in their own hands to decide. I think all buildings should be built reasonably fire-resisting, especially public buildings, business premises, and country mansions. There seems to have never been a public building so reasonably fire-resisting as the Colosseum of Rome, and although such a building is unlikely to be built in this age, yet its lessons should not be lost upon us. A building of to-day would be more composite in its materials, but take my word for it, simplicity in materials, as in details, is often the secret of good design. It is distressing in the extreme to hear of public buildings being destroyed by fire, probably with some loss of human life, of immense places of business reduced to a heap of ashes, dislocating trade, and throwing scores of people out of work at a moment's notice; of some old ancestral mansion engulfed in the same fury, destroying, in its irresistible force, not only the building, but at the same time, priceless works of art that are lost for ever.

It is time, therefore, that more attention were given to fire-resisting buildings, even in a small way; and if wood is still to be used, it must be rendered entirely non-inflammable, in such a manner as not much to increase its market value or render it unworkable on the bench; or, if wood cannot be so treated, then some other material is wanted to fill up the missing link—some material that will be easily worked into all the varied uses to which we now put wood; such as our doors, windows, staircases, and innumerable other things. It must not only be non-inflammable, but must be of such a nature as will admit of its being worked into all the uses I have indicated, and also of being

adaptable to all the alterations that occur in ordinary life; such as the alteration of buildings, or even the alteration of a door, or a window, or making a new way through a partition, &c. Wood lends itself easily to all these alterations. It is owing to this very word "alterations" that so many schemes now in the market for fire-resisting purposes fail; but that fatal word "alterations" must be reckoned with, for although the quality of being fire-resisting is a most important question, yet it must go hand in hand with ordinary usefulness, for buildings change owners, and often uses, and alterations become inevitable.

The new material, if indeed we are to have one, must have a further quality, beyond being fire-resisting, it must be proof against all influences as to wetness or dryness; it must not shrink when the fires are lighted, or swell in a damp building; for, as I have said before, men will not wait nowadays for natural materials to season. How different all this is from the time in which they took to erect the mansions of the time of Elizabeth or James, Burghley, Montacute, Crew, Audley End, Burton Agnes, and many others, in which twenty years were frequently spent in the erection and completion of these houses; but then look at the glorious results. If wood ever ceases to be one of our prime materials in building construction, it will be with a great twinge of regret that we shall part company with it, for has it not been associated with us since time was; have we not fashioned our dear, old British oak into all the uses of our lives, do we not look with pardonable pride on its sympathetic grain, as it encases our cosy panelled rooms, and think of its great traditions immutably bound up with some of the most glorious events in our national history? I do believe, fire-resisting considerations notwithstanding, that the oak will never leave us.

There is another circumstance in our practice I must refer to; I allude to the testing of materials. The scope for this subject is endless, as all experimenters know. It is too vast a subject to be undertaken by a private individual, and no Government will undertake it. We have not the advantages that our friends the civil engineers possess in frequently having the wealth of a huge company behind their backs to conduct experiments without limit. No, our works are not of such a colossal size as our friends', and will not justify such an expenditure. How, then, can this thorough, far-reaching, and absolutely authentic series of experiments be carried into execution.

There are, and have been, men who have devoted much expense and time to these matters, and to whom we are much indebted, but the information is frequently fragmentary, and not easy to reach. There has been no thorough series of experiments for architects on materials in purely architectural construction. The Institute have very lately carried out some experiments as to the strength of brickwork, &c., which are most valuable, but I do not think the expense of the system I am now foreshadowing should fall on only a part of the members of our profession; I think a much greater grasp should be taken of the situation. All our building materials as used in the ordinary building manner should be subjected to exhaustive tests of every kind, not only with regard to strength, or endurance, but also to that "fire resistance," to which I have before alluded. I do not mean that every piece of brick, stone, concrete, wood or iron should be tested, but sufficient experiments should be carried out to establish reliable data. All this would be a matter of hard facts, there would be no question of design or other debatable ground, to interfere with the steady carrying out of this scheme. After we are in possession of the mass of facts such a scheme would bring out, we could, from the knowledge then acquired, design accordingly; and who can tell what school of design or style of architecture this would produce?

But, as I said before, all this will cost money, and it will be a continuing expenditure. I am not going to say who is going to move first in this matter, or to say how it is to be brought about; I shall leave that to the collective wisdom of the members of our profession; all I would suggest is, that in such a scheme the control should be in the hands of the Institute, and all members of the profession, whether members of the Institute or not—all members worth the name—should contribute, in annual subscriptions, such a sum, as to make it worth while for the best men to give us the benefit of their services.

#### GLASGOW SCHOOL OF ART.

A COURSE of six lectures on "The Architecture of the Renaissance in France" was commenced, on the 7th inst., by Mr. W. J. Anderson, A.R.I.B.A., at the Glasgow School of Art. The art of the Renaissance, he said, was the art of a period which we were leaving behind, being in a state of transition, but as distinguished from antiquity and the Middle Ages it might be regarded as the work of our contemporaries, from whom it was natural to suppose we should learn most.

Speaking, in introduction, of the Renaissance as a whole, the lecturer said that it was part of the course which the Roman Empire of the West had to trace—a partial concession to antiquity, an attempted reconciliation of the ancient standards with the Christian. That this was necessary was due to the depraved state of the Medieval Christian faith, and the movement, in its complementary tendencies of Humanist and Protestant, was an entirely beneficent one. It was a European awakening, not merely an Italian one; yet never far from the old Roman foundations were its monuments to be found. In these monuments one got nearest to the spirit of the past, which it was impossible to recreate perfectly; and, properly understood, they constituted the only documents necessary for the interpretation of the broader movements, and even much of the detail of the history of the era. By illustrations of the Château Pierrefonds, Gailon, Azay-le-Rideau, &c., the students were enabled to follow the unfolding of the charming chateau style out of the defensive machine of the feudal castle. The development of the town house of the nobles, brought about by similar causes, such as the greater security of the country, was treated, and the variations which the change in the conditions, and especially the larger field open to the designer, induced in the details. For with the consolidation of the kindly power in France, the architect, too, comes into his inheritance. On the part of the workmen, co-operation with the master craftsman in the making of a perfect whole is the ideal now substituted for the medieval one of rivalry with one another in the details of a subordinate part.

In conclusion, Mr. Anderson said that in these studies the aim was not artistic reproduction, or the opening up of new opportunities of imitation; but that they might better understand such developments, and have their ideals raised to a loftier plane, especially that the lesson might be learned that architectural growth comes of the artist's acceptance of new conditions of life, of the new purposes which architecture is privileged to serve. The subject was in this lecture brought down to the end of "The Transition" (1475-1515), which is followed by the François Premier period.

The second lecture was delivered on the 21st inst. The first part was given up to the Transition style in church work, which persisted through the reign of Francis I. (1515-1547). In the case both of the fortified castle and the mediæval church, the architectural form outlived the age which it properly represented, but the structural change which had already begun to penetrate the chrysalis of the feudal castle did not reveal itself in the Gothic church during the Early Renaissance period. The conservatism which has always surrounded religious forms preserved the mediæval fabric and handed it over intact to a later time. The changes in this reign were consequently limited to the decorative envelope, and were illustrated by a series of examples, among which were Tours Cathedral, St. Jacques, Diennes, St. Pierre, Caen; Rambervilliers, and St. Eustache, Paris. Taking up afterwards the chateau style at the point where it was handed over by the artists of Louis XII, the north wing of Queen Claude at the Château of Blois was just noticed. The unrivalled staircase, which, in its exceeding refinement, holds a place among the traditional French staircases, like that of the Parthenon among Doric temples, was very fully illustrated. Other buildings of the period described were the kindred and contemporary Château of Chandonceaux, the sculptured house of Moret, of which a fragment has been reconstructed at Paris, and the vast, weird, and fantastic Chambord. This chateau, which retains the great round towers and other characteristics of the type handed down from the feudal age, is one of the last survivals of the causes which called them into being, and testifies by its situation and by certain details of arrangement to peace-



ful uses. The architectural cycle which began with the donjon towers is complete with the cone-capped cylinders of Chambord, which fall to be replaced by the more convenient pyramidal pavilions of Orleansais and the Château Madrid.

#### GODALMING MUNICIPAL BUILDINGS COMPETITION.

WE have received a copy of the following letter which has been addressed to the Mayor and Corporation of Godalming by five competitors in the recent competition:—

#### "BOROUGH OF GODALMING: MUNICIPAL BUILDINGS COMPETITION.

To the Worshipful the Mayor and Corporation of the Borough of Godalming.

GENTLEMEN,—We, the undersigned, having submitted designs for the above-named competition, and having received copies of the assessors' report and information as to the design selected by the Town Council, respectfully beg to call your attention to the following facts in relation thereto:—

No. 1. A schedule of instructions was issued on behalf of the Council to each competitor, setting forth the conditions under which the designs were to be prepared.

No. 2. The most important and absolute of these conditions was the following, viz.:—

"A passage is required along the south side of the public hall, indicated on the block plan, to be 2 ft. wide if the engine-house be placed at the back, and if otherwise, 6 ft. wide. The plan accompanying this condition shows the way required, and the exact position of it, by a coloured strip."

There was also a question upon the point addressed to the Council and numbered 9 in schedule, as follows:—

"If fire engine is placed on back part of site, may not the road to the 'Buries' roadway be used as access for engine to public road, instead of the passage through centre of site as suggested?"

The answer given was as follows:—

"The 10 ft. passage into Bridge-street is regarded as essential if the fire engine-house is placed on the back of site."

With reference to the above point we consider that nothing could be more clear than the intention of the Town Council, as expressed in the conditions and as shown upon the plan supplied by them to the competitors, neither could anything be more definite than the answer given to the question that this condition was to be regarded as essential. It made no variation possible to those who intended to carry out the instructions. We would also point out that the nature of this condition was such that it could not be regarded as of small moment, because it was of primary importance in the planning of the buildings, and completely controlled the whole disposition of the several parts of them.

Under these circumstances, it is with great surprise that we learn that the design selected and adopted by your Council violates the one condition which was stated to be essential, and also the condition which, more than any other, influenced the arrangements of the plans. We are also at a loss to understand how the assessors could have recommended for the first place a design at variance with this condition, unless he entirely overlooked the point. We may safely conclude that he must have done so, as he could not have otherwise passed over such a variation as that referred to without remark, and further stated that the designs were in accordance with the conditions and instructions issued.

The plan selected does not provide a 10-ft. way on the south side of the public hall as indicated on the block plan, but this space is built over contrary to the instructions on the ground floor. It cannot be argued as an answer to this objection that the design selected provides some adequate alternative for the requirement laid down in the conditions, or that the alternative so provided is even an improvement upon what the conditions required.

We respectfully submit that in awarding the premium the only equitable course that could be followed was to disqualify any design that infringed a condition involving a radical change of plan, and make a selection from among those which had faithfully followed the conditions so clearly laid down. Under these circumstances, we regret that we feel compelled to strongly protest against the premium offered being awarded to a design (whatever its alleged merit) which is at variance with the condition involving a radical change of plan, and cannot be done without great injustice to us, and in support of this view we may refer to the emphatic statement made by the Editor in the issue of the *Builder* of the 5th inst. Upon a matter of this description no higher or more impartial authority could be quoted.

We cannot think that it is the desire or intention of the Town Council of Godalming to ignore conditions which they themselves laid down, or to act otherwise than fairly and in good faith with regard to them. We therefore appeal to them with the more confidence to take such action as shall be

equitable to those competitors who have carried out their instructions.

(Signed)

ARDRON & DAWSON,  
8, Delahay-street, S.W.  
CHARLES BELL,  
3, Salters' Hall-court, E.C.  
E. R. ROBSON, F.S.A.,  
9, Bridge-street, Westminster, S.W.  
J. WILLIAM STEVENS, A.R.I.B.A.,  
21, New Bridge-street, City, E.C.  
SAMUEL WELMAN  
(Welman & Street),  
Guildford & Godalming."

#### LONDON IMPROVEMENTS, SESSION 1899.

THE London County Council's Bill, to be promoted next Session in Parliament, in respect of improvements in London relates to the widening of Wandsworth-road, Lambeth, Kensington High-street, and Southampton-row, Bloomsbury, and to the new thoroughfare from Holborn to the Strand, together with other projects.

The "new central street" is planned from High Holborn, opposite Southampton-row, to the north corner of the site now occupied by the Olympic Theatre. It will be connected with the Strand at two points by a "curved street," of which the eastern end is to form a junction with the Strand, as it will be widened between St. Mary's and St. Clement Danes' churches, and the western end is to form a junction with the Strand between Catherine and Wellington streets. The plans provide further for six subsidiary streets along the line of route, to effect junctions with (1) Little Wild-street, taking the site of the Metropolitan Electric Supply Company's works (behind the west side of Lincoln's Inn-fields, near Sardinia-street); (2) with the south-west corner of Lincoln's Inn-fields, taking the site of the Strand Workhouse and Infirmary (in Bear-yard); (3) with the junction of Kemble and Great Wild streets; (4) with Clare-street (through Clare Market); (5) with Houghton-street; and (6) a new street over the site of Exeter-street (between Wellington and Catherine streets). The "curved street" will join the "central street" at the site of the Olympic Theatre, and is to have junctions with Drury-lane between Craven-buildings and Blackmoor-street, and with Catherine-street at or near the site of the Gaiety Theatre. The Strand is to be widened between Catherine-street and St. Clement Danes.

Thus it will be seen that the demolitions for the projected thoroughfare will include either the whole or the part of a great number of streets, courts, passages, and alleys, amongst them being Sardinia, Vere, Denzell, Clare, Newcastle, Wych, Holywell, Little Catherine, White Hart, Blackmoor, Stanhope, and Little Wild streets, George, Chapel, Bear, Denham, Craven, Halls, and Queen's Head yards, Portsmouth-place, Clare, and New Inn passages, Maypole-alley, Sardinia-place, Wild-court, Craven and Twyford buildings, together with New Church, Angel, Helmet, and Windsor courts, leading out of the Strand. The widening of Southampton-row will be along its east side southwards from Vernon-place and Theobald's-road, with two new streets leading into Kingsgate-street at Fisher and Eagle streets respectively, and a widening of High Holborn between Southampton-row and the premises now being erected (for Parr's Bank) at the corner of Southampton-street.

The north side of High-street, Kensington, will be set back between the corner of Church-street and a point distant about 30 yards east from the end of Palace-gardens, with a new roadway from Clarence-mews (near Church-street) to High-street at Brown's-buildings, the Vestries of Kensington and St. Margaret and St. John, Westminster, to contribute to the widening of High-street. The Council propose also to widen Wandsworth-road, Lambeth, on the south-west side, between a point about 60 yds. east from Nine Elms-lane and Bond-street, opposite the South Metropolitan Gas Company's works, and to rebuild Cat-and-Mutton Bridge across Regent's Canal, with new approaches in the parishes of Shoreditch and Hackney, the Vestries contributing, and the existing swing bridge over the London Dock Cut at Old Gravel-lane, with powers to provide for the latter work being carried out by the London and India Docks Joint Committee as may be agreed upon.

The Council seek for powers under the Bill to acquire lands for the erection of dwellings for displaced persons of the labouring and poorer classes at (a) Pakenham and Arthur streets, including the London Improved Cab Company's premises, in St. Pancras; (b) on the site of, and round about, Holborn Union Workhouse, near the corner of Clerkenwell and Gray's Inn roads; and (c) at Palmer-street, near St. Andrew's Church, Lambeth, and at the same time to utilise for that purpose the lands, or portion of the lands, they have already acquired under their scheme in pursuance of their Clare Market Provisional Order Confirmation Act, 1897.

The Bill provides that "Lands within the improvement areas delineated on the plans . . . and not purchased and taken by the Council . . . which may be increased in value by the improvement, shall be liable to value by an improvement charge placed [on them] . . . in respect of any increased value which such lands may respectively derive from the improvement."

Former plans, "Holborn to the Strand," proposed by the Council and others are described and illustrated in the *Builder* of October 19, 1889; July 25, 1891; July 9, 1892; and October 12, 1893 (L.C.C.); April 20 and October 26, 1889 ("A. E. H."); July 13, 1892 (Mr. L. W. Leeds); July 8, 1893 (Mr. C. J. Shoppee); and August 5, 1893 (Mr. Harry Assiter); we have also illustrated Mr. C. Forster Hayward's scheme, 1882.

#### COMPETITIONS.

THE NEW ROYAL INSTITUTION, COLQUHITT-STREET, LIVERPOOL.—The design for the new Royal Institution, Colquhitt-street, submitted by Messrs. Briggs & Wolstenholme, 3, Lord-street, has been awarded the first premium of sixty guineas, and the second premium of twenty guineas has been awarded to Mr. R. W. Beddingfield, A.R.I.B.A., of 5, Hotel-street, Leicester. The designs and plans will be on exhibition at the Royal Institution, Colquhitt-street, for public inspection daily from 9 a.m. to 9 p.m. (except Thursday mornings) until December 15.

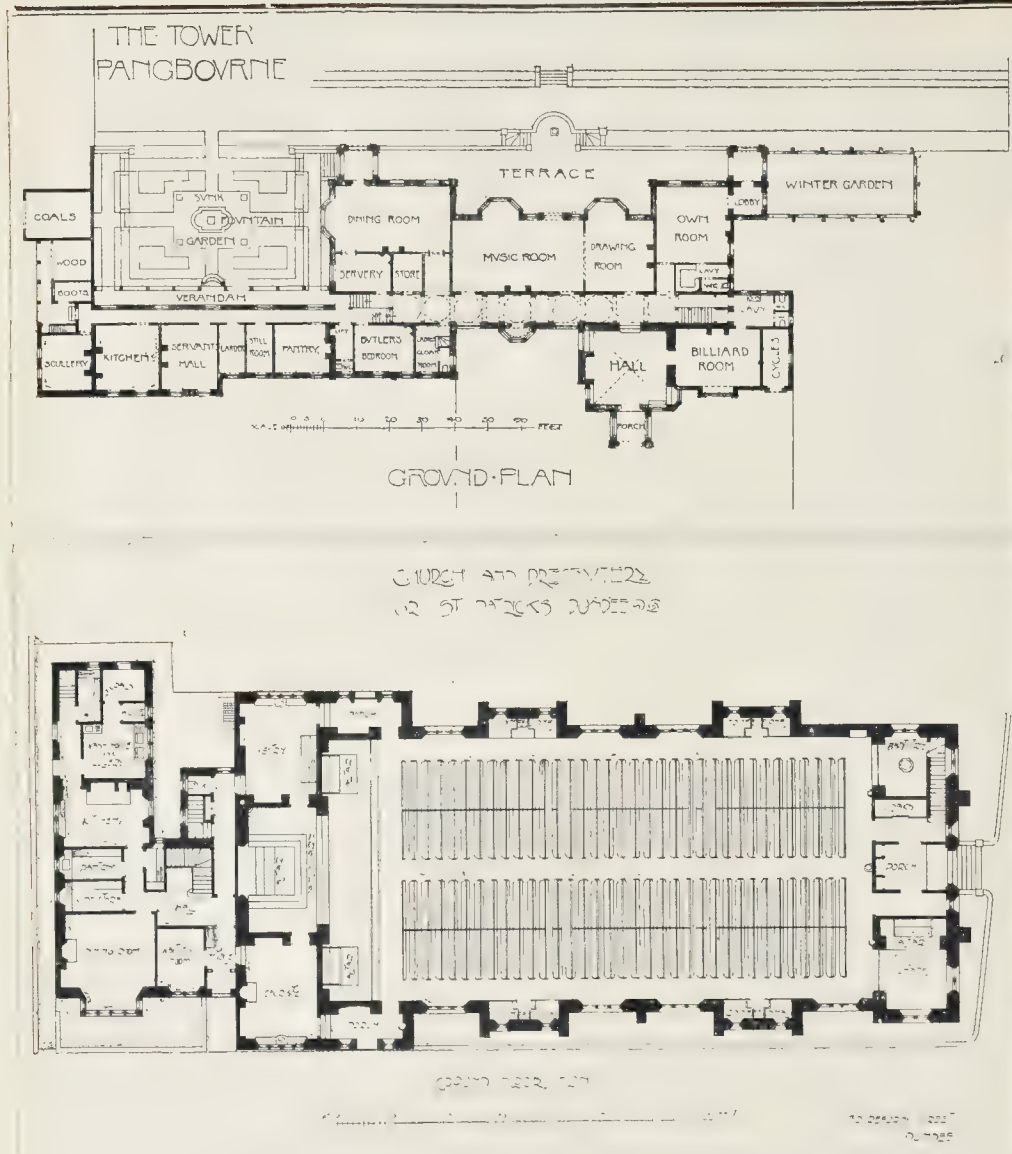
EXTENSION OF BURNLEY UNION WORKHOUSE.—In a limited competition amongst the architects having offices in the Burnley Union, six sets of plans were sent in for an extension to this workhouse. Mr. Littlewood, of the firm of Messrs. Mangnall & Littlewood, Manchester, was the assessor, and he gave the premium of 50l. to "Experience." On opening the letters, it was found that the author of "Experience" was Mr. Samuel Keighley, of Nicholas-street, Burnley, who will be engaged to carry out the work.

HOP MARKET HOTEL, WORCESTER.—In consequence of a street improvement decided upon by the Worcester City Council—the widening of Foregate-street—the Worcester Hop Market Hotel has to be rebuilt. In a competition among Worcester architects four sets of plans were sent in. The plans of Messrs. H. Rowe & Son have been accepted.

CHURCH, GLASS HOUGHTON, CASTLEFORD.—The design of Messrs. Demaine & Brierley, architects, of York, has been selected in an open competition for a proposed new church at Glass Houghton, in the parish of Castleford. The design is in the late Decorated style of Gothic architecture, is to be built of brick, is planned to accommodate 600 people, and is estimated to cost 6,000l.

#### GLASGOW ARCHITECTURAL CRAFTSMAN'S SOCIETY.

—The fourth meeting of the above society was held on Friday, November 18, when a paper by Mr. James J. Little, sanitary inspector, was read on "Conditions which Render Houses Unhealthy." In considering his subject he first named the essentials for a healthy life—light, air, and water; and contrasted in several ways the conditions of town and country life, noting, for example, the impure air of the town and the bad water in the country. Insufficiency of light gave increase of dirt, and lack of cleanliness caused lack of godliness. He then treated of various evils in our towns such as the centralisation of buildings causing smoke, and from that fog, which assists the growth of bacteria by shutting out the blue sky of heaven. Building on made or on damp soil, porous stones, curtained windows, dark inside stairs, untidy offices, defective drainage, lack of ventilation and free space, were several of the innumerable conditions which caused unhealthy houses. Artistic construction, he contended, was part of sanitary construction, and the relation between the construction of a building and the health of its occupants was very marked.



### Illustrations.

#### "THE TOWER, PANGBOURNE."

**T**HIS house, now in course of erection, is situated on an eminence commanding one of the finest views in Berkshire. An old square "tower," built in the beginning of the century, occupied the site, and has given its name to the property. It possessed, however, no special interest, and was in a dilapidated and dangerous condition, which necessitated its removal.

The new tower, represented in the illustration of the entrance front, is erected on its site, and will form a part of the main structure of the house. Its type is similar to that of many old Scottish towers, but the house generally favours the later developments of the Renaissance in this country.

The materials throughout are Chilmark stone and red brick facings. The roofs generally are to be covered with permanent green slates, and partly with lead flats from which the fine prospects can be enjoyed on occasion. The internal fittings and finishings are in keep-

ing with the several parts of the building. The view of the entrance hall indicates the character of the work in the tower.

The plan, as may be seen, is symmetrical in form, but the symmetry has not been allowed to hamper the convenient arrangement of the interior. A wide corridor runs the whole length of the building, and has an oak staircase at each end. This arrangement is continued on each floor. The kitchen wing is cut off from the house, and a sunk garden closed on three sides is formed by the extension. The south or garden front is symmetrically treated, and a wide stone loggia, which the slope of the garden necessitates, is terminated at each end by an open loggia. Above these are douche baths for the first floor bedrooms.

The outbuildings, which will consist of stables, laundry, boiler and dynamo houses and shops grouped together, will be situated at a short distance from the house.

Messrs. Foster & Dicksee, of Rugby and London, are the contractors, and Mr. Rhodes is the clerk of the works.

The architect is Mr. John Belcher. The three drawings, of the tower, the interior of

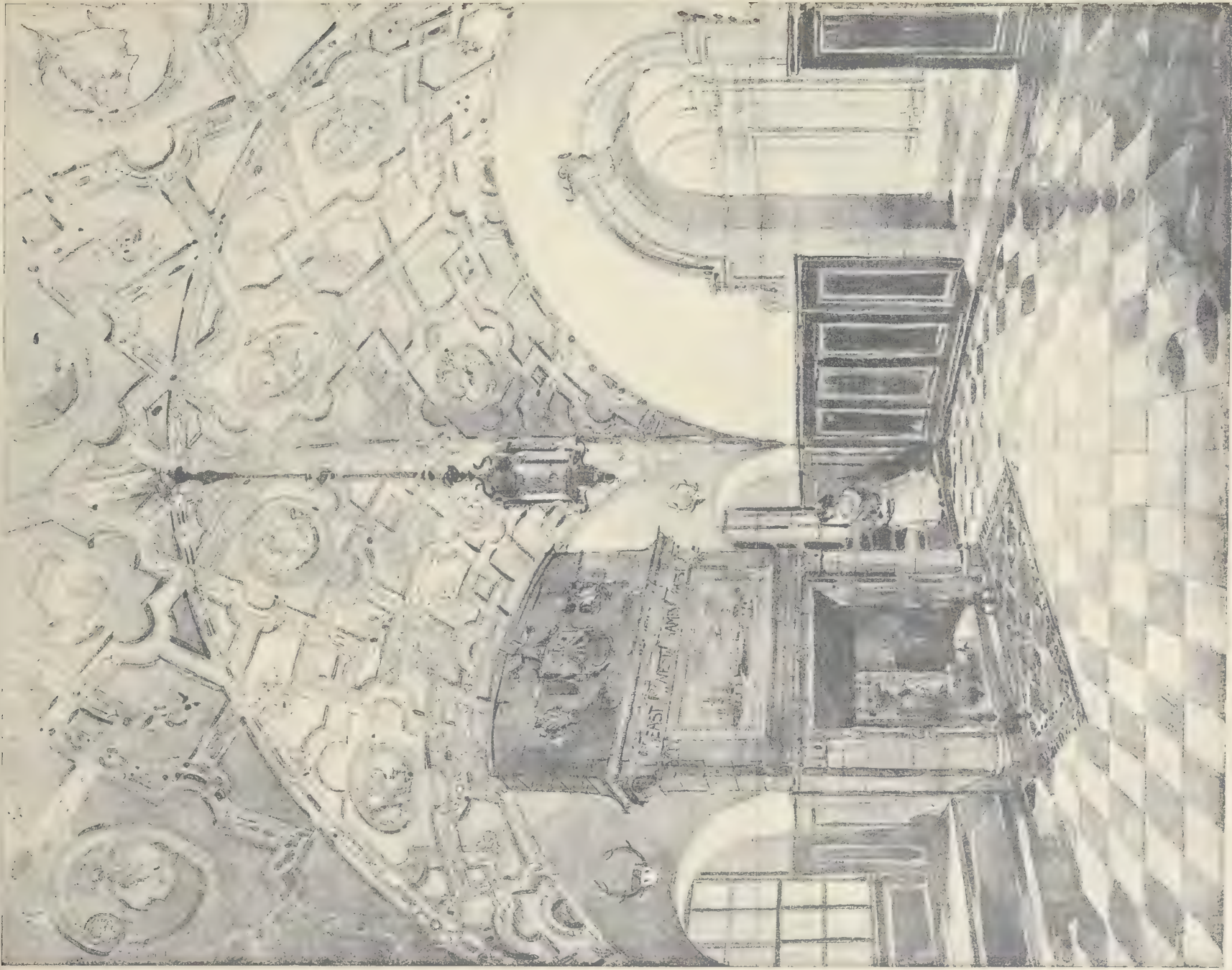
the hall, and the general view from the garden were all exhibited at the last Royal Academy.

#### R. C. CHURCH AND PRESBYTERY OF ST. PATRICK'S, DUNDEE.

**T**HIS church, of which a plan is subjoined, consists, as will be seen, of one large nave without aisles, 104 ft. long by 50 ft. wide, with a height to the ceiling of 42 ft. On one side of the main entrance is the mortuary chapel, on the other side the baptistry, with a font designed and presented by the architect. The floor of these chapels are laid with marble mosaic. Over the entrance and chapels is the organ and choir gallery.

The church is built of coursed rubble, with red stone quoins and dressings. The roof is constructed with steel principals, and the ceiling is divided into bays by moulded ribs. The floors inside the Communion rail are laid with wood blocks, and the main floor of the church with deal boarding. The woodwork (seats, &c.) is stained a dark hue and varnished. The walls and ceilings have been finished with Duresco. The windows are filled with leaded glass in low colour tints. The heating is by





HOUSE AT PANGBOURNE; ENTRANCE HALL.—MR. JOHN BELCHER, F.R.I.B.A., ARCHITECT







HOUSE AT PANGBOURNE. ENTRANCE FRONT.—MR. JOHN BELCHER, F.R.I.B.A., ARCHITECT

BUILT BY MR. SPRATUE & CO. 4 & 5 EAST HANNOVER STREET LONDON AND E.C.



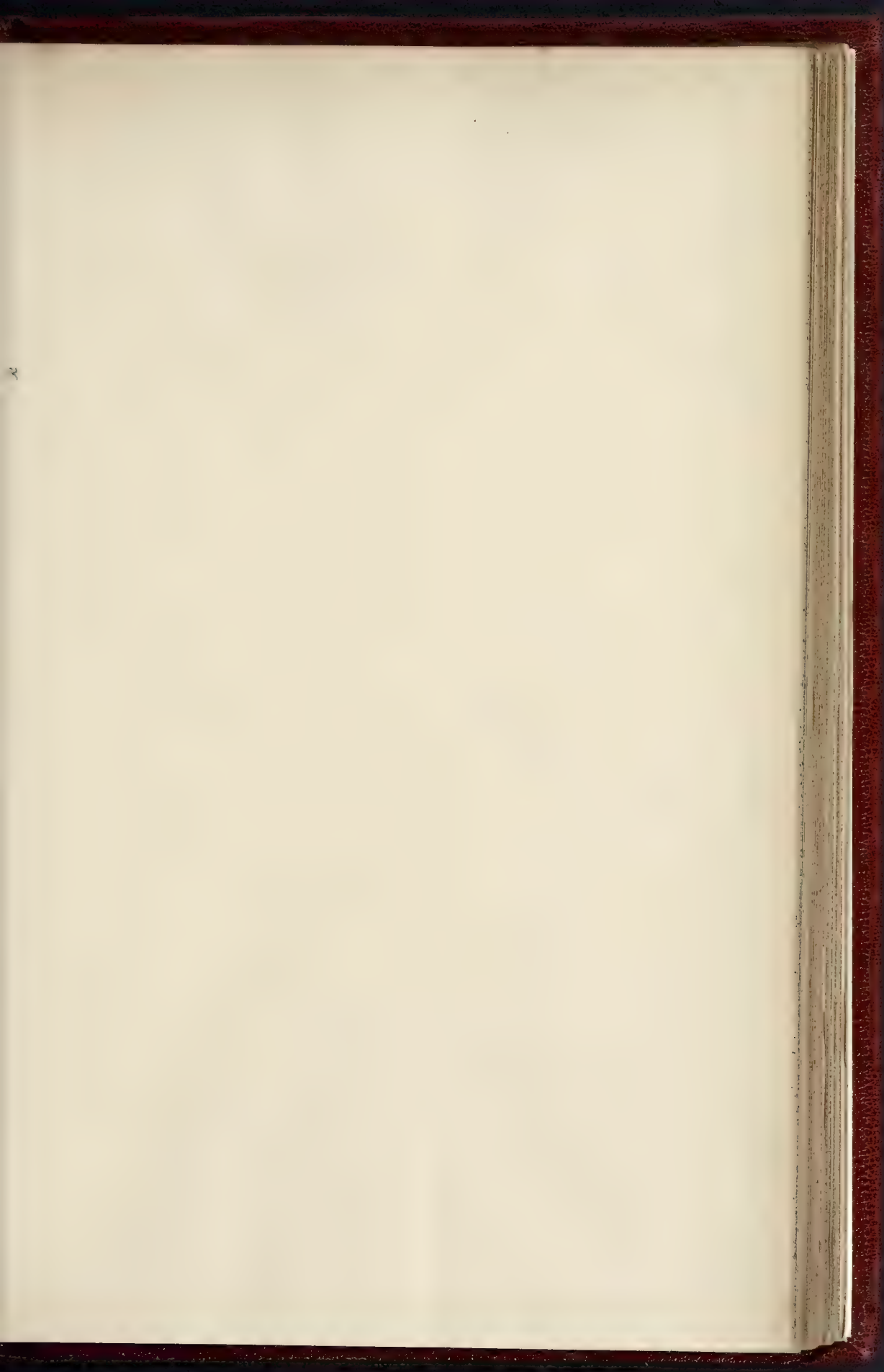




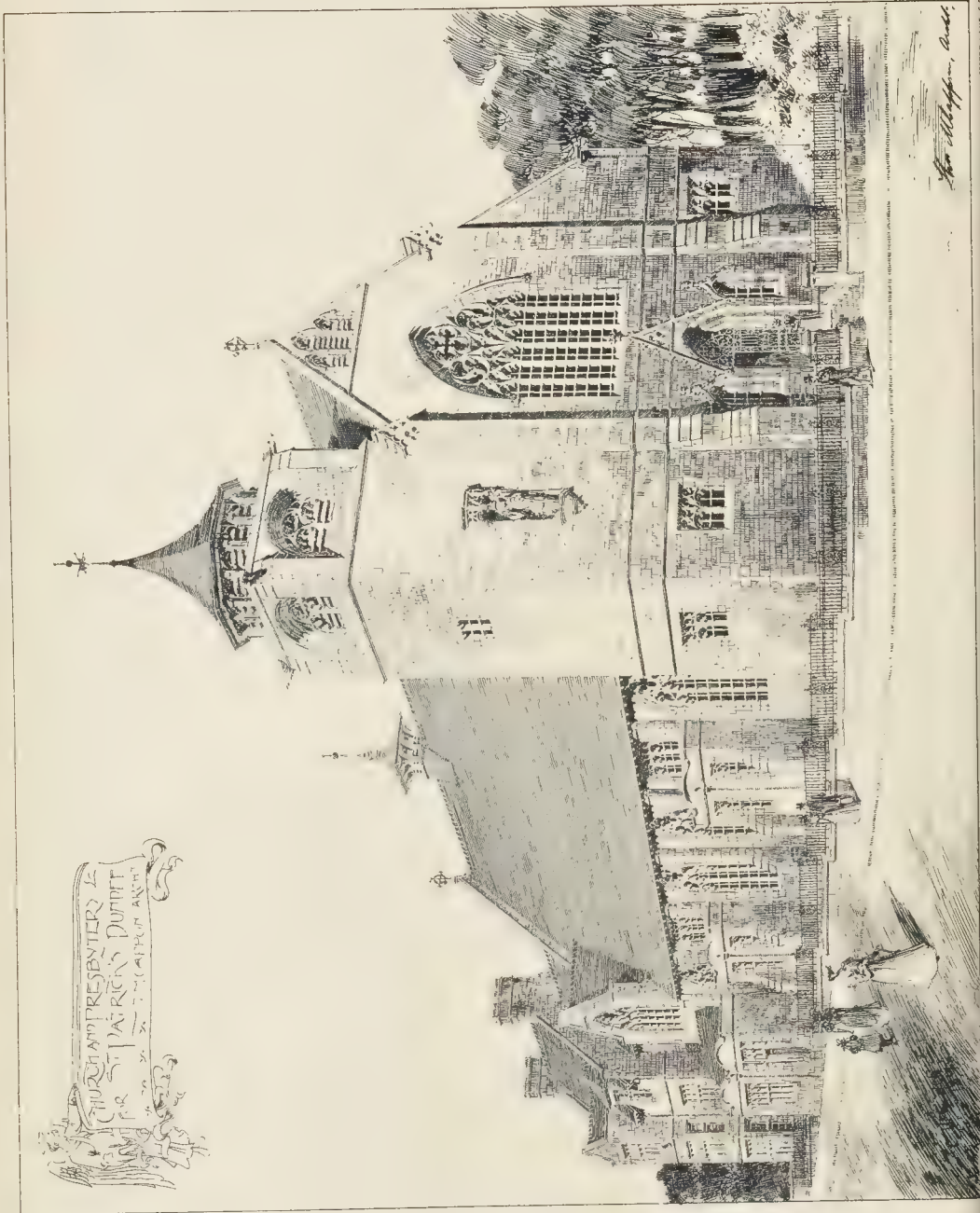
HOUSE AT PANGBOURNE VIEW FROM GARDEN - MR JOHN BELCHER, F.R.I.B.A., ARCHITECT







THE BUILDER NOVEMBER 26 1898





Proposed R.C. Church of S. Augustine.  
Notttingham.

Arthur Marshall A.R.B.A.  
Architect.







low pressure steam, with radiators at convenient points.

The contractors who have carried out the work are:—For mason's work, Mr. W. Bennet; joinery, Mr. T. C. Stokes; plumbing, Mr. D. Brown; plastering, Mr. Lawless; painting, Mr. Norwell; glazing, Messrs. Lindsay & Scott; heating and tile work, Messrs. G. H. Nicholl & Co.; parquetry and mosaic, Messrs. Ebner (London); and wrought-iron work, Mr. A. McCall.

Mr. T. Martin Cappon, of Dundee, is the architect. The perspective view of the church was exhibited at the last Royal Academy.

#### PROPOSED R. C. CHURCH OF ST. AUGUSTINE, NOTTINGHAM.

This church is shortly to be erected on a somewhat limited site in the Woodbro'-road, Nottingham. The building will be built of local bricks and Red Corsehill stone. The interior will be faced in stone.

The plan explains the general arrangement, but it may be noted that the rapid fall of the street lends itself to the provision of the necessary vestries under the chancel.

Mr. Arthur Marshall, of Nottingham, is the architect. The drawing was exhibited at the last Royal Academy.

#### THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The third meeting of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, W., on the 18th inst.; Mr. H. J. Leaning, Chairman of the Section, in the chair.

A paper entitled "The Architects' Library" was read by Mr. Philip A. Robson, A.R.I.B.A. The author said he did not intend to read out a catalogue of books, but would treat of the architect in relation to his library. "Knowledge is of two kinds," Dr. Johnson once said, "you may know a thing yourself, or you may know where to find it;" and to be able to do so, books are essential to the architect. While we should read the older books, we must also be conversant with new works—for if we neglect the present for the past, we throw away our best chances of success. Personally, the thought architect than text, and instanced the way in which the plates in the professional journals were eagerly studied and criticised. We must perforce economise our reading, and this was to be found in the art of skipping and skimming judiciously, so that the substance of a book might be obtained. He thought that no man could dictate to another what he should read, so much depended on personality; and that our reading should converge to one point, working round it and avoiding deconcentration. It seemed to him that the first books to be acquired were those we made ourselves—sketch-books, measured work folios, photographs, rubbings, and note books; next to these he would place books of reference—histories, dictionaries, encyclopedias, &c.; and then books with as little letterpress in them as possible; some of the best and most useful examples of which, he thought, were the A. A. Sketch Book, and the folios on the English Renaissance, by Gotch, Belcher, and Macartney. He was of opinion that we should not neglect to study catalogues for new books on art, and that we should make a catalogue of, and attend to our books ourselves. We should beware of damp, heat, worms, insects, and mice. Oak, teak, and cedar were the best woods to use for cases, and glass doors were essential. The cases should not be more than 7 ft. 6 in. or 8 feet high, and hot-water pipes should not be nearer than 3 ft. to the books. He thought that private libraries in this country should face south-east, and be well ventilated.

The discussion was opened by Mr. C. H. Strange, and continued by Messrs. W. B. Hopkins, H. A. Satchell, H. V. C. Smith, J. H. Pearson, and C. H. Brodie.

The chairman summed up, and a vote of thanks (proposed by Mr. Strange and seconded by Mr. Hopkins) was passed unanimously to Mr. Robson for his valuable paper, after which he briefly replied, and the meeting terminated.

The next meeting of the Discussion Section will be held at 56, Great Marlborough-street on December 2, when a paper will be read by Mr. A. E. Henderson (Owen Jones Student), entitled "Santa Sophia and Excursions into Asia Minor."

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday afternoon, at the County Hall, Spring Gardens, Mr. T. McKinnon Wood, Chairman, presiding.

**Loan.**—On the recommendation of the Finance Committee it was agreed to lend the Guardians of the Strand Union 6,420*l.* for additions to workhouse.

**Working-Class Dwellings.**—The adjourned Report of the Housing of the Working Classes Committee was proceeded with. Mr. Bruce, Chairman of the Committee, stated that a letter had been received from the East-End Dwellings Company, Limited, with regard to the Ann-street, Poplar, scheme. The letter was to the effect that as the Council had been unable to induce the Local Government Board to modify the decision conveyed in their last letter, the directors of the company had no alternative but to drop the matter. They were willing, however, to join in a deputation to the Local Government Board. He moved the following recommendation of the Committee:—"That the operation of Standing Order No. 315 (2) (a) be suspended in the case of the dwellings to be erected on the land comprised in the London (Ann-street, Poplar) Improvement scheme, 1893, and that the Housing of the Working Classes Committee be authorised to terminate the negotiations with the East-End Dwellings Company, and to proceed with the preparation of plans with a view to the Council itself erecting dwellings. Mr. Beachcroft supported the recommendation. On a division there were—For, 69; against, 30. The motion was therefore carried by the majority necessary under the Standing Orders.

**Painting Work, Clapham-common.**—The Parks and Open Spaces Committee reported as follows:—

"In the annual estimates is provided a sum of 250*l.* to cover the cost of painting work required to be done to the fencing at Clapham-common. For this sum the architect estimated that 2,011 common hurdles could be painted with three coats, and 450 more with two coats, and 740 ft. of unclimbable iron fencing with two coats. We referred the particulars and estimate to the manager of works with a view to the work being done by the Works Department, but the manager has reported his opinion that the estimate is not sufficient. The chief officer of the Parks Department is prepared to undertake the work. We recommend—That the Council do authorise the expenditure of the sum of 250*l.* for the work of painting hurdles and fencing at Clapham-common as specified by the architect; and that it be executed without the intervention of a contractor, under the superintendence of the chief officer of the Parks Department."

Mr. Hoar moved to refer the matter back. In his opinion the Parks Committee ought to contribute to the establishment charges. Mr. Burns seconded, but the amendment was lost. The recommendation of the Committee was then agreed to.

**Blackwall Tunnel.**—In reply to Earl Russell, Mr. Ward, Chairman of the Bridges Committee, said there were two four-inch mains running through Blackwall Tunnel carrying water to the East London Company's mains, but provision was made in the construction of the tunnel, whereby it was possible to take much larger mains.

The Committee recommended, and it was agreed, that the Council do sanction an expenditure of 1,026*l.* for certain supplemental works required to be carried out at the Blackwall Tunnel; that the works be carried out at the estimated cost by the Council without the intervention of a contractor, and that the drawings, specification, and bills of quantities be referred to the manager of works for that purpose.

**Lines of Frontage.**—The following recommendation of the Building Act Committee, the consideration of which was postponed last week, was then considered:—

"That the consent of the Council be given to the erection of bay windows and balconies in front of the new ward blocks on the south side of Marylebone-road, as shown on the plans submitted with the application of Mr. A. S. Strell on behalf of the Guardians of St. Marylebone, such consent being subject, however, to the following condition—That the bay windows and balconies be commenced within six months and completed within eighteen months from November 15, 1898; that the work be carried out to the satisfaction of the District Surveyor; that the bay windows and balconies be otherwise made in entire conformity with the letter of application, and as shown on the plans accompanying it, and be not at any time, in any manner,

altered or raised, or the balconies further enclosed, without the consent of the Council; and that if such plans or application be hereafter found to be inaccurate in any particular, the consent of the Council shall be null and void."

The Earl of Meath moved to refer the matter back for further consideration, as he saw no reason why the Act of Parliament should be infringed in the manner proposed.

Mr. F. Smith seconded.

Dr. Longstaff said that he had looked carefully into the matter, and he did not think there had been such an encroachment as Earl Meath supposed.

The amendment was defeated, and the Committee's recommendation was agreed to.

**The Smoke Nuisance.**—The Public Control Committee reported the conviction of various persons and firms for infringing the Smoke Prevention Act.

Mr. Verney said that the result of the Council's action was very small considering the large amount of damage and annoyance which had been caused by volumes of black smoke from chimneys in crowded districts.

Lord Meath thought the Public Control Committee deserved the thanks of the Council for the action they had taken. He hoped that where the vestries in other parts of London neglected their duty the Council would institute proceedings against them.

**Widening Upper Thames-street.**—On the recommendation of the Improvements Committee, it was agreed that the amount of the Council's contribution to the City Corporation in respect of the widening of Upper Thames-street between Queen-street and St. Andrew's Wharf be 11,413*l.* 13*s.* 8*d.*, and that the matter be referred to the Finance Committee with a view to the payment of the money, subject to the City Corporation giving an undertaking to complete the improvement by setting back the remainder of the property in front of No. 36, Upper Thames-street, at the expiration of the leases.

**Gas-Engines, Lots-road Pumping Station.**—On the recommendation of the Main Drainage Committee it was agreed, after a long discussion, that the tender of Messrs. Crossley Brothers, Limited, amounting to 10,744*l.* 6*s.* 5*d.*, for the manufacture, delivery and erection of eight double-cylinder gas-engines at the proposed new pumping station in Lots-road, Chelsea, be accepted.

The Council adjourned soon after seven o'clock.

#### COURT OF COMMON COUNCIL.

ON the 17th inst., a meeting of the Court of Common Council—the first in the new Mayoralty—was held at the Guildhall.

In the course of the sitting an application by the Vestry of Hackney for the use of the Guildhall for a proposed conference of Local Authorities of the metropolis on the subject of trade obstructions and costermongers' stalls on the highways was acceded to.

A letter was read from the London County Council inviting the Corporation to appoint a representative to the conference about to assemble to determine some general scheme for the maintenance of small open spaces in London. The Corporation appointed Mr. Matthew Wallace to be their delegate on the occasion.

The Library Committee brought up a report on the recent loan exhibition of French pictures at the Guildhall. It stated that the whole of the works, some of which had been sent from America and Canada, and large numbers from France, had been returned to their respective owners without accident. The total attendance at the exhibition on eighty-seven days was 206,852, the average on week-days being 2,538, and on Sundays 1,162. The expenses had been 1,104*l.*, but the sale of catalogues had realised 610*l.*, bringing the net cost to 493*l.* The 156 pictures were insured for a quarter of a million.

The report was adopted.

Another report was brought up from the same committee on the question of having a loan exhibition of the works of Turner at the Guildhall next year, and an exhibition of paintings of the Spanish school in 1900. They recommended that the matter should be deferred for the present, pending definite inquiries, which was agreed to.

The Improvements and Finance Committee submitted an arrangement for making a new street, 40 ft. wide, connecting Crutched Friars



and Fenchurch-street, the owners of a vacant site contributing 6,000*l.* towards the cost. The arrangement was approved.

A plan was also submitted and approved for making Lothbury 50*ft.* between Old Jewry and Prince's-street, at a cost of 42,000*l.*, of which the County Council would contribute one-third.

The Streets Committee brought up a report on a letter from the Metropolitan Electric Supply Company, Limited, asking for the Corporation's consent to their application to the Board of Trade for a provisional order for the supply of electricity within the City. The committee recommended that the company should be informed that the Corporation regretted that it was unable to give its consent to the application.

The report was carried.

Sir Albert Altman moved that it be referred to the Streets Committee to consider and report on the dangerous condition of Ludgate Hill Station and the necessity of more accommodation being provided for passengers, with power to communicate with the Board of Trade on the subject. He said the structure was the worst station in the world. It was built of wood, and was near being destroyed by fire the other day. The results of a fire there would be appalling. The entrances to the platforms were lamentably deficient, and people ran great risk and danger in catching their trains.

The resolution was seconded by Mr. Morton, and carried unanimously.

After other business had been transacted, the Court adjourned.

#### METROPOLITAN ASYLUMS BOARD: THE BROOK HOSPITAL INQUIRY.

At the fortnightly meeting of the Metropolitan Asylums Board on Saturday, Sir Edwin Galsworthy presiding, a letter was read from the Local Government Board, enclosing a copy of the report of their Chief General Inspector, Mr. W. E. Knollys, as to the recent inquiry conducted by him into the expenditure on the Brook Hospital.

Mr. Knollys stated in his report that of the sum of 50,000*l.*, by which the cost of the work exceeded the contracts, the principal item was extra foundations, which the architect estimated would cost 5,000*l.*, but which ultimately, without the knowledge of the Hospital Committee, cost 10,144*l.* Other items of additional expenditure were brought to the notice of the managers and sanctioned by them, but an expenditure of at least 25,000*l.*—including the extra 14,000*l.* on foundations—was incurred on the architect's own responsibility, without the knowledge or consent of the Committee. The balance of 12,000*l.* included site levelling, roadways, terrazzo skirtings, heating apparatus, &c. Much of this expenditure, although very improperly incurred by the architect without due authority, was necessary, or, at least, very desirable. But some of the deviations from contract had no justification whatever, and not only increased the cost, but caused the general contractors to have to be compensated for loss of profits on the portion of the work taken from them. It appeared to him that the architect showed extraordinary audacity in venturing to incur such items of expenditure without consulting the Committee. The architect acknowledged that he had been most unwise. But there was not the slightest evidence that he acted otherwise than as he believed would improve the character of the hospital. His object was to make the institution of the best possible type, with all the newest improvements called for by medical and architectural science. He appeared to be oblivious of the fact, and much resented it being mentioned, that the amount of his own fees might be influenced by his action. The Inspector thought it a matter for serious consideration whether it was fitting that the fees should be paid on expenditure not absolutely necessary, and undertaken without the knowledge or consent of the managers.

With regard to the supervision exercised by the Committee, Mr. Knollys considered that it might well be, as urged by members, that it was impossible for them to know if the works on a large building were being carried on in compliance with the terms of the contracts. But he would have supposed they would make it their duty to see that expenditure on such matters as flooring, stoves, painting and distempering of walls, and terrazzo skirtings was not being incurred otherwise than as provided

by contract. Had the Committee carried out their duties as a committee, with due regard to their responsibility, it should not have been possible for the large extra expenditure to remain quite unknown to them.

As to the managers as a whole, there was no evidence of any special supervision on their part. Sums were paid to the contractors on the architect's certificates, without reference to the Hospital Committee. While of course the managers had no option as to paying contractors, this did not prevent due inquiry as to the details of the work certified for had been required, or financial statements furnished by the architect in the earlier stages of the building, the large expenditure in excess of contracts would have been shown. The excessive expenditure on the Fountain Temporary Hospital, of which Mr. T. W. Aldwinckle was also the architect, should have made the managers feel that in the present case very careful supervision was needed.

He was glad to see that the managers had since taken steps to adopt a better system, architects being now instructed to report at once all variations in contract work, and to obtain written sanction where the cost was over 25*l.*; while on such extras the managers required a statement of all previous extras on the same contract.

In conclusion, he thought it right to mention that it was stated to him that if a site of different conformation could have been secured, the expenditure on the hospital would have been considerably reduced.

The Local Government Board in their letter concurred in the views expressed by Mr. Knollys in his report. They considered the proceedings of Mr. Aldwinckle deserving of grave reprobation, and thought that the Committee had failed in the supervision which ought to have prevented the irregularities of that gentleman. They added that when payments were made to contractors on the certificates of the architect, the managers should clearly have been furnished with information as to the work certified, and whether it was included in the contract.

The Chairman moved that the letter and report should be referred to the Works Committee. Special attention would have to be given to the questions of supervision of works in progress by Committees, and of the payment of contractors upon architects' certificates.

Mr. J. Brown (late Chairman of the Brook Hospital Committee) seconded. With regard to the charge made against the Committee of want of supervision, he ventured to suggest that there had been almost too much supervision by the Committee. For what purpose did they employ professional gentlemen selected according to the best of their judgment, and pay them an extremely liberal commission? He failed to see how any committee in the kingdom could take upon themselves the detailed supervision which was the work of the professional expert. There was great danger in a committee walking round and making casual remarks. The architect in charge might easily be led to make alterations under the belief that he had authority for them which the Committee afterwards would not approve. The less their Committees had to do with the superintendence of work under the charge of a professional adviser the better. As to payment on certificates, that was an intensely difficult subject. He never heard of a case in which the architect granting a certificate was able to define exactly the points of the work on which it was given. He believed at the close of the work they had 20,000*l.* of the contract sum in hand, and so long as the total was not closely touched they felt safe in the hands of their professional adviser. Public men would not be found to undertake such work if responsibilities of this kind were thrown upon them.

Mr. J. Brass contended that a loss of 70,000*l.* had been caused by the defective site, which was forced upon them through the refusal of the Local Government Board to approve the site at Footing Bee.

Mr. R. Strong, L.C.C., agreed that the Local Government Board must share the responsibility. The managers would never have built on this site but for the fact that it was the first site that they could get approved for a lengthened time, although much better sites had been offered. In addition, the Local Government Board insisted on their building so far back from the roadway that they had to leave the level ground and build on a hillside, which added enormously to the cost. He

did not agree with Mr. Brown that the Committee should leave the architect alone. He believed they should go round and make suggestions. If the architect was so limp and weak as to agree to everything he heard, that was his own fault. In this case it was said that the suggestions of both members and officers of the Board had been adopted without consulting the Committee in the proper way. As to payment on certificate, the inspector's dictum would make it absolutely impossible for public men to carry on their work, were the views of the Committee to override the technical knowledge of a highly-paid professional man. No builder of repute would take work if unskilled committees had a veto on the word of the architect as to payment.

Mr. Edward White, L.C.C., said this was not a scandal in the ordinary sense of the word. How were the Committee to know of the orders given by the architect unless he told them? The only possible course was to have confidence in their architect, only in this case the confidence was very much abused. He was glad the Board were now building up a better system, and that instructions for architects were being adopted which would make irregularities of this kind impossible. Even these would be useless if the architect paid no attention to them. He agreed with Mr. Strong and Mr. Brown that there would be the gravest difficulty in going behind the architect's certificate, and, as to the site, no less than 53,000*l.*—practically the whole—was due to their being obliged to build on the hillside. He would recommend a new clause in every contract that no work in addition to the contract should be paid for unless the order was countersigned by the Clerk of the Board. If that were done in all cases of 25*l.* and upwards, there was no fear of unexpected extras, to the value of many thousands, in future.

Mr. Lile thought the weak point was that they had so many competing architects. It would be better if, like the School Board, the Corporation, and the County Council, they had a permanent architect to advise them.

After further discussion, the motion referring the matter to Committee was carried.

Another letter was read from the Local Government Board declining to authorise the payment to Mr. Aldwinckle of the commission on the work ordered by him without the Committee's consent, amounting to 375*l.*

**Works Committee.**—On the recommendation of this Committee the plans prepared by Messrs. Pennington & Son, architects, after conference with Messrs. Burstall & Monkhouse, consulting engineers, for the electric lighting of the Northern Hospital were approved.

It was resolved to apply to the Local Government Board for authority to accept the tender of the Horsfall Furnace Syndicate to erect a destructor at the North-Western Hospital for 232*l.* without public competition.

#### BUILDERS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

THE fifty-first annual dinner of the Builders' Benevolent Institution took place on the 17th inst., in Carpenters' Hall, London Wall. Mr. B. J. Greenwood (President) occupied the chair, supported by Messrs. Trollope, Collis, Mansfield, T. F. Rider, Holloway, Nightingale, Hall, Holliday, Ellis, Sherrin, Robinson, Randall, Burt, Hall, Higgs, Hill, Ritchie, C. Bussell, C. A. Bussell, J. T. Bolding, Griffiths, Lough, T. Stirling, T. Stirling, junr., Ansell, Grover, and numerous other supporters of the charity.

After the usual loyal toasts had been duly honoured, Mr. T. F. Rider, in a humorous speech, proposed, "The Army, Navy, and Auxiliary Forces," Major R. A. Bruton (Secretary) responding for the Army and Navy, and Colonel Trollope, V.D., for the Auxiliary Forces.

The Chairman, in proposing "Success to the Builders' Benevolent Institution," contended that the charity was deserving of all the support they could give to it. In these days the rush of life and the fierceness of competition seemed to become greater and greater, and it was not at all surprising that some should fall behind and be left prostrate by the wayside of life. This Institution acted the part of the Samaritan, and afforded such assistance as to make life less burdensome.



Since its formation nearly 300 people had been assisted, and so far as its principle was concerned it was not capable of improvement. Some of the pensioners had at one time been in affluent circumstances, and that was an additional reason for sympathy with the aims of the Institution. It was the most skilful man who ran the greatest risk, so that no one was certain that he might not some day be in need of help. In consequence of the great age of some of the candidates, the committee had decided to elect all those who were eligible without the necessity of canvassing. He hoped the Institution would continue to prosper until the dawn of Old Age Pensions, when he supposed such charities would become things of the past. If that were so he trusted the scheme would be done on more equitable lines than in the case of the Employers' Liability Act.

The toast was drunk with enthusiasm. Mr. J. Howard Colls next proposed "The Worshipful Company of Carpenters," who so kindly gave their hall for these annual banquets, and were at the same time good supporters of the Institution. Mr. Jacob, Warden of the Company, replied.

Mr. H. Holloway, in proposing the toast of "The President," said that Mr. Greenwood was not only a good speaker but an excellent worker. He also referred to the great loss the charity had sustained by the death of Mr. George Plucknett, who had so long acted as its Hon. Treasurer.

Mr. J. S. Holliday gave "The Architects and Surveyors." Speaking as a contractor, he might say that he had got on uncommonly well with the architects with whom he had been associated in business. The surveyors were imbued with the same spirit, and their only desire was to act fairly and honourably.

Mr. George Sherrin replied for the architects. He considered they had generally to act as advocates on behalf of the contractor, as clients were not conscious of the difficulties to be overcome in carrying out work of an important nature.

Mr. Sydney Young responded for the surveyors. The quantity surveyor, he added, was a man who did a great deal of arduous work, and who applied himself to the unravelling of complicated details. One of his chief qualifications was that he should have a fair mind, and he believed that that was usually the case.

Mr. S. B. Depree proposed "The Vice-Presidents, Committee, and Stewards," to which Mr. J. T. Bolding replied.

In the course of the evening subscriptions were announced amounting to £875, of which the President's list represented £718, including £105 from the President and his firm.

#### ARCHITECTURAL SOCIETIES.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The opening meeting of the Edinburgh Architectural Association for the session was held on the 16th inst. in the Royal Institution. Mr. Thomas Ross, the President, occupied the chair, and devoted his presidential address to the subject of "The Development of House Planning in Scotland from the Fourteenth to the Seventeenth Centuries." In the course of a few introductory remarks, it was shown that previous to the fourteenth century there was little remaining in Scotland to indicate in what kind of houses the people dwelt, the inference to be drawn being that such dwellings were of a slight and fragile kind. But from the fourteenth century onwards there was a vast body of evidence of a most interesting and instructive kind, and of an architectural value, which had not received the attention it merited. In all parts of the country there were keeps, towers, and castles, as they were differently called, which, by their fancifulness of detail, by the excellence of their masonry, and ingenuity of construction, excited our admiration, and many of them were duly appreciated by those to whom they belonged. But, on the other hand, it excited one's astonishment to see the indifference with which many a stately tower was regarded and allowed to fall into ruin. The general characteristics of a Scottish keep of the simplest kind, and the various methods adopted to enlarge such a building, were explained by plans. It was shown that the original idea was one room on each floor, so as to leave the tower open on all sides, and that any addition proceeded by way of a single-chambered tower on one side, and

the same thing if required on the other side, always so placed as to leave the original tower open and free on some part of its four sides. The singular plan of Borthwick, unique in Scotland, where both the additional towers are on one side, was described. In considerable detail and with the aid of diagrams the gradual growth of the mansion-house from the keep was traced, and how the limited space of the latter, which was principally given up to the common hall, failed to satisfy the proprietors during the sixteenth and seventeenth centuries. In this connexion Elcho Castle, near Perth, was shown to be a most typical example—a connecting link between the old and the new—absolutely unaltered, and in good preservation. Melgund, in Forfarshire, was cited as another instance of such a house. It, at the same time, exhibits a curious harking back to old ideas in having a keep built at one end, so that at first sight it appears to be a building of two periods, while in reality it is all of one period. Drochil Castle, Peeblesshire, which is erroneously supposed never to have been inhabited, was shown to be a most exceptional plan for a Scottish nobleman to adopt for his house at the end of the sixteenth century. Here, perhaps, for the first time in Scotland, a complete departure was made from the old style of planning by the introduction of a central corridor, of great width, from end to end of the house, and from which rooms opened on either hand and on every floor. The country, however, was not ripe for such a sweeping change, and probably not till last century was the plan ever repeated. Macellan's house, Kirkcubright, and Kelly in Effe were illustrated as most interesting examples of Scottish houses of a moderate size. The remarkable ruin at Barns, near Longniddry, presented a very pointed example of the desire for a more spacious style of house than was common. Built about the same time as Drochil, but never finished, it was strongly fortified, and it had many features in its plan which brought it into touch with modern ideas. The culinary arrangements of these old buildings, as exhibited in the many curious kitchens which still remain, were fully described and illustrated with plans.

**EDINBURGH ARCHITECTURAL SOCIETY.**—On the 16th inst., a meeting of this Society was held. Mr. W. N. Cumming, the President, in the chair, when Mr. J. A. Morris, of Ayr, read a paper on "Architecture." Mr. Morris dealt with his subject as an art, in opposition to a profession, dwelling on the influences of our own day, which he said gave great promise for the future.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—A party of members of the Liverpool Architectural Society, headed by Mr. W. E. Willink, President, paid a visit of inspection last Saturday to the Thompson-Yates Laboratories at University College. Professors Boyce and Sherrington met the party at the laboratories, and conducted them through the various rooms. Dr. Hope afterwards showing them through the Hygiene Museum. The first members' meeting of the Society was held on the 21st inst. at the New Law Library, 41, Castle street. Mr. W. E. Willink presided. A paper was read by Mr. Edmund Rathbone on "Liberalism and Conservatism in Architecture." Mr. Rathbone displayed a number of photographs depicting the various styles of architecture from the early Egyptian period up to the present time. He pointed out that up to the time of the Reformation all architectural work had been inspired by religion. In the present day, when the religions of the world had become so innumerable, men had specialised and the styles of architecture had become almost as numerous as the religions themselves, whilst their originality was oftentimes more remarkable than pleasant. What was wanted in this generation was that they should form a tradition—some such tradition as they had had in the old world. Professor Simpson moved, and Mr. F. E. P. Edwards seconded, a vote of thanks to Mr. Rathbone, which was adopted.

#### BOOKS RECEIVED.

"ALPHABETS: OLD AND NEW." By Lewis F. Day. (B. T. Batsford.)

**NEW CHURCH, ABERDEEN.**—The foundation-stone of the new Church of St. Fittick's, Walker-road, Torry, Aberdeen, has been laid by Mr. L. Mackinnon, jun. The church will cost in all about 4,500l., and the architect is Mr. A. H. L. Mackinnon, Aberdeen.

#### ARCHÆOLOGICAL SOCIETIES.

**BRITISH ARCHÆOLOGICAL ASSOCIATION.**—The second meeting of the session was held at the rooms in Sackville-street, Piccadilly, on Wednesday, the 16th inst., Dr. Winstone in the chair. Mr. Andrew Oliver exhibited the remains of a sword and a small knife, which, together with the boss of a shield, were found with three skeletons at Portslade, near Brighton, Sussex, in July last, in the formation of a new road. The skeletons faced to the east. After the removal of the antiquities the human remains were examined and carefully interred in the churchyard at Portslade. The opinion of the meeting was that the exhibits belonged to the Romano-British period. Mr. Gould exhibited another photograph of the Roman pavement at Leicester, which has already been illustrated in the Journal of the Association, and read some additional details regarding it, bringing out the interesting fact that the houses recently demolished, under which the pavement was found, occupied the site of a house once the residence of John Bunyan. A paper on Wool Church, Dorset, by Dr. Fryer, was read in the author's absence by the Rev. H. J. D. Astley, Hon. Sec. One of the principal features of this church is the chancel arch of thirteenth century date, which is perhaps unique for that period. The unusual and effective appearance of this arch is produced by the filling up of the large arch and piercing the wall with three arches of equal width, each 10 ft. 6 in. high and 3 ft. 6 in. wide. These three sub-arches rest upon shafts of octagonal form 32 in. in circumference without capitals, and with base moulds near the floor. The tympanum is quite plain, with no trace of decoration, although it is quite likely this was originally intended. The church also possesses a font of the fifteenth century, of special interest, as it was evidently purposely designed for its present position against the westernmost pier of the north arcade of the nave. Fragments of Cresset stones have occasionally been discovered in England, but Wool Church possesses one in almost as good a condition as when it left the hand of the mediæval mason. There is a tradition that the bells of Wool Church were stolen from Bindon Abbey at the Dissolution, but this is contradicted by the bells themselves, as all of them are dated, the oldest being of the year 1606. The first portion of a paper upon the Welsh Marches, by Mr. C. H. Compton, V.P., was read by the author. In the middle of the eighth century the Saxons made many encroachments in the territory of the Welsh beyond the Severn; so the Welsh took up arms and made many successful incursions upon the Saxon territory. In order to arrest these predatory attacks of the Welsh, Offa, King of Mercia, united himself with the Saxons, with the result that the Welsh, being unable to resist these combined forces, retired to their natural strongholds among the rocks and mountains, and from thence continued their inroads against their enemy. Offa, therefore, annexed the country between the Wye and Severn and planted it with Saxons, and for additional security caused a great ditch to be made, anno 776, which was called Clawth Offa, or Offa's Dyke. In the discussion which followed the paper, Mr. Gould observed with reference to this dyke, that he had traced it throughout himself and felt able to affirm that it was never intended as a line of fortification—a misunderstanding which was very common with respect to it. It was merely intended as a boundary line between England and Wales. The Rev. H. J. W. Astley, the Chairman, and others also spoke upon the paper, which was a most interesting summary of the history of the Marches.

#### Correspondence.

To the Editor of THE BUILDER.

ST. ANDREW'S PRESBYTERIAN CHURCH, BLACK ROCK, DUBLIN.

SIR,—In the description of this building given in your issue of the 12th inst. the names of the architects are given as Murray & Foster instead of Murray & Forrester. To avoid misunderstanding, we shall be much obliged if you will kindly correct the mistake. The names of the two firms being so much alike are sometimes misleading.

MURRAY & FORRESTER



## The Student's Column.

SOUND, LIGHT, AND HEAT.—XXI.

LIGHT : REFRACTION (continued.)

**A**NOTHER practical application of refraction is furnished by the optical installations in lighthouses. Trueman Wood has given an excellent summary of the aims of the lighthouse engineer and the problems he is called upon to solve. He must obtain the most powerful penetrating light possible, and he must avail himself of every fraction of that light, not wasting any on sky or land, but sending all out to sea, and to that part of the sea where the light is most wanted. He must send it far over the water, to the utmost horizon which the lofty tower or cliff, on which the lighthouse is situated, affords him. After these conditions have been satisfied, the engineer must give each light a character of its own, so as to distinguish it from amongst its neighbours.

A great portion of the optics of the lighthouse consists in resolving that problem comprised in the phrase "not wasting any (light) on sky or land." It is evident that unless special methods are devised, a large proportion of the light would be directed landwards, and such rays have to be captured and directed to required positions, with as little loss as possible. Of course, in lighthouses of the Eddystone class the problem is somewhat different, the light having to be used all round, the greatest care being taken not to permit the upward and downward escape of rays. From what we have said in the last article concerning the treatment of light rays on passing through prisms, the student will readily understand that a convex lens placed in front of a light will collect the diverging rays falling upon it and transmit them as a parallel beam. The same result is obtained by the use of a plano-convex lens. The great practical difficulty in employing such lenses, however, is the tremendous size they would have to be to get anything like a powerful result. So Fresnel applied the polyzonal lens (invented by Buffon), and became the father of the dioptric system of lighting. This kind of lens is based on the plano-convex principle, by excavating the plane surface and cutting it into a series of prisms, so arranged as to refract a central light, or series of central lights, in beams composed of parallel rays.

The dioptric system, as described by Mr. Chance,\* consists of a structure of glass zones, or segments, which in a complete apparatus envelopes the sphere of light radiating from the central flame, except that portion which is intercepted by the burner, or is occupied by its chimney. The vertical axis of the burner coincides, of course, with that of the apparatus. In reality, the upper, middle, and lower portions of the system generally have different foci. An angle of about 57 deg., which the focal horizontal plane bisects, is acted upon by refraction alone; but the rays which pass above and below this angle are deflected by internal total reflection.

The phenomenon of internal reflection is well described by Trueman Wood. When a ray of light passes obliquely into a prism its course is bent, as before explained—it is refracted; as it passes out of the prism through one of its other sides into the air it is refracted again. But suppose the angle at which the ray meets this second side to be so oblique that if it passed out without refraction it would just clear the side, the ray does not get out at all. It is reflected off from the inner surface of the glass, as if the layer of air next that surface had been a layer of quicksilver; and not only so, but the whole ray is reflected, none being absorbed, as is the case with the most perfect mirror. This power of total reflection is most valuable for lighthouse purposes.

In Fresnel's original scheme the annular form of lens was selected, for, not only did this afford a means of considerably reducing the substance of the glass, but each ring was given its own individual shape, so as to correct spherical aberration. The collective effect of this lens is that it sends forward an infinite number of conical beams, which radiate from within its substance, and whose axes are all parallel to that of the lens; so that, at a moderate distance, the aggregate effect is one conical beam, the axis of which is the lenticular one. The intensity of this collective

conical beam varies in different directions, according to the corresponding parts of the flame from which the rays proceed; the maximum intensity is, of course, in the direction of the axis, from which the brilliancy gradually diminishes, until it becomes a minimum at the boundary of the beam.

The refracting belt of the fixed light is cylindrical, as described by Mr. Chance, and was formed by the revolution of the vertical central section of the annular lens round the vertical axis of the system, so that this belt was lenticular in every meridian plane; but not so in any horizontal one; and hence the central light retained its natural divergence in azimuth, and thus distributed, in every direction of the horizon, an uniform illumination.

It has been known for many years that there is a limit beyond which prismatic deflection becomes wasteful, partly by chromatic dispersion and partly from the increasing loss by reflection at the surfaces of incidence and emergence. It occurred to Fresnel to employ totally reflecting zones, but Alan Stevenson was the first to extend the application of horizontal reflecting zones to dioptric apparatus of large dimensions—at Skerryvore lighthouse in 1843.

In regard to the composition of glass used for lighthouse purposes, which is practically applicable also to prisms used for refraction generally, on the large scale, the proportion of silica varies from 72 to 78 per cent., depending on the particular kind of glass, the remainder consisting for the most part of soda from 12 to 18 per cent., and lime from 6 to 15 per cent. Alumina and oxide of iron are present only in extremely minute quantities. Occasionally a little arsenic, and rarely carbonate of potash, red lead, and manganese have been employed.

### Decomposition of Light.

We have hitherto dealt with the refraction of light as though the rays emerging from the prism were of a simple character, and the original beam of sunlight merely impeded in its progress through the prism. As a fact, however, the beam is split up into several parts, so that the whole quality of the light is different to what it was at first, in other words, the light is decomposed into several kinds of light, which phenomenon is known as dispersion. A triangular prism of glass is generally employed in experiments upon this dispersion of light, and the coloured image thus dispersed is called a spectrum. The colours seen in the ribbon of the spectrum are seven, namely, red, orange, yellow, green, blue, indigo, and violet, of which the red arises from the least refrangible rays, and the violet from the most refrangible, the others having a calculable refrangibility lying between the extremes. On examining this ribbon through a telescope, it will be found that the different colours are crossed by a great number of dark lines, known as Fraunhofer's lines.

The lines are best studied by making a sun-beam pass through a spectroscopic, in which several prisms are mounted in a most careful manner. A common form of this instrument is composed of three telescopes mounted on a single foot, and whose axes converge towards a prism of flint glass. One of these telescopes can be turned round the prism; this is the one employed for viewing the spectrum. One of the others is so arranged that near what would be the eye-piece a lamp is placed; the light rays passing through this telescope are projected on to the prism as parallel rays, and on leaving the prism the light is decomposed. In this condition it falls on to the objective of the first telescope, through which the observer is looking, and is seen (much magnified, of course) as an image of the spectrum. The third telescope is employed in conjunction with a micrometer for measuring the relative distances of the lines of the spectrum. The minor parts of the instrument need not be described here.

There are three chief types of spectra (1), continuous, (2) band or line, and (3) absorption. The first of these is furnished by ignited solids and liquids, and consists of a continuous band of the colours already mentioned. The second consists of a number of bright lines, passing at right angles across the darker portions of the band; these are produced by ignited gases or vapours. Absorption spectra are furnished by the sun and fixed stars, and are consequently of chief use to the astronomer. For us the spectroscopic must only be regarded as an analytical instrument, and principally as an aid in chemical analysis and in the preparation of metals and alloys.

To show how the spectroscopic is worked, let us take some sodium and burn it in the flame alluded to; it will be noticed on the spectrum that a bright yellow line has now made its appearance, i.e., a bright line (or thin band) has been formed in the yellow part of the continuous spectrum. As often as we burn sodium this line will be seen, and always in the same position. The spectrum of lithium is a clear line in the red portion, and another in the orange, and so on. In other words, each element has characteristic lines; so that on viewing the lines in the spectrum of a body the chemical composition of which was not known, it is possible by means of the spectroscopic to arrive at some idea of the elements contained in it. In this way, scientists feel confident that they now know something of the chemical constitution of the sun and certain stars—only in the case of the latter the lines are dark and not bright, due to a cause which need not here be considered.

In addition to its luminous properties, the spectrum produces calorific and chemical effects. On placing a thermometer in it, it will be found that the temperature rises at that instrument is moved from the violet towards the red end. Then, again, the comparative temperatures of incandescent bodies may be judged according as they produce much or little red (hot), or violet (colder), in their respective spectra. The violet and ultra-violet portions of a spectrum produce more energetic chemical action than the other parts.

The spectroscopic has been found useful in the manufacture of pig-iron. Dealing with this application, Professors Bloxam and Huntington observe\* that pig-iron, containing from 2 to 4 per cent. of manganese, can be worked by what is known as the direct process, when it is only desired to reduce the carbon to 0.3 or 0.4 per cent., as for rails; i.e., the "blow" is continued until the carbon is reduced to the requisite amount, the manganese still remaining in (0.1 to 0.3) being sufficient to render the metal workable. This method is in use in Sweden, and parts of Germany, where suitable pig is available. It would not pay to make pig specially for the purpose by introducing manganese into the blast-furnace. The exact moment at which the "blow" should be stopped can only be judged of by means of the colour of the slag and forgeability of globules of metal rapidly withdrawn from the converter on the end of an iron bar.

After having been once decomposed a beam of light may not be further reduced by the same process. Thus, if we capture, say, the violet portion of the spectrum, and isolate that from the remaining portions, and then cause it to pass through another prism, the effect is merely the transmission of the violet through the glass, and it remains violet after the passage, though the violet rays are again refracted to some extent. Different portions of the spectrum are unequally refrangible, however.

### Photography.

A few words, only, on this subject must suffice. We have observed that the violet and ultra-violet portions of a spectrum produce more energetic chemical action than the other parts. Chloride of silver blackens under the influence of light, especially in the violet portions. Photography has been described as the art of producing permanent images of objects by utilising the changes which certain substances undergo in the presence of light. In what is known as a collodion picture a clean glass plate is held by one of its corners while a stream of collodion holding iodide and bromide of potassium in solution is poured over the plate, and the excess allowed to drain off. Ganot, in describing the process, (Op. cit. p. 508) observes that the plate is then immersed in a bath containing 30 grains of nitrate of silver to the ounce of water. This operation must be performed in a yellow or orange light. The plate is then removed, drained, and placed in a dark slide in the camera. After exposure, no change is visible on the plate, but on pouring over it a solution of pyrogallol, or ferrous sulphate to which some acetic acid has been added, the image slowly appears. When all the details are visible the plate is fixed by immersion in a bath of hyposulphite of soda or cyanide of potassium. By another process the collodion is impregnated by the silver salts direct.

In gelatine or "dry" plates gelatine is em-

\* Min. Proc. Inst. C.E., vol. XXXI., 1867, p. 478.

\* Metals, their Properties and Treatment, 1894, p. 209.



ployed instead of collodion, as the sensitiveness of the salts of silver is greatly increased thereby. At a later period transparent celluloid was devised as a substitute for glass in dry plates, which celluloid acts as a support for the gelatine film—as in the kodak camera. Quite recently methods have been devised for permanently retaining coloured images.

The glass-plate films and gelatine films retain and form "negatives." To produce a "positive" or true picture, the negative is placed on a piece of sensitised paper; or, in the case of lantern-slides, on another film. The sensitised paper is of various kinds. In one of them, the negative with paper under it being exposed to the light for a short time, the chloride of silver on the paper becomes acted upon by the light rays in such a manner that the lights of the negatives are replaced by shades on the paper, and inversely. The picture is then immersed in a bath of gold chloride, then in a solution of hyposulphite of sodium, and finally is thoroughly washed in water.

The student of architecture knows the uses of photo-printing of plans, which saves much work in the office. When he is "on tour" the dry plate in the photographic camera is made to do duty, where, formerly, the sketch-book alone was his companion. This is to be regretted in many respects. To fix the details of a building in the student's mind there is no better way than for him to sketch them. If the camera is allowed to do the work, much of the value of the object lesson is lost.

#### OBITUARY.

**SIR JOHN FOWLER, BART.**—For some considerable time past the gradually failing health of Sir John Fowler had given cause for the greatest anxiety, yet his death, which occurred last Sunday evening at Bournemouth, where he had been staying for some months, was very sudden, his immediate friends not anticipating that the end was so near. Although Sir John had not given very great attention to engineering matters during the last few years of his life, yet he was so well known, and so universally accorded the highest place in his profession, that his death, notwithstanding his advanced age of eighty-one, comes as a personal bereavement to all engineers. For more than half a century his name has been before the public, and it is not an exaggeration to say that he was connected, in one way or another, with practically every engineering work of any magnitude that has either been proposed or executed during this period. It would be far beyond the limits of our space to even mention the names of the works with which he has been connected; but many of them are so important that a short reference to them is necessary, since upon these rests Sir John's reputation as one of the greatest engineers of recent times. It is now forty-five years since the first Act of Parliament giving permission to construct an underground railway in London was obtained. The little line—for it was only some two miles in length—from Edgware-road to King's Cross, was the commencement of our present underground railways system, with which the name of Sir John Fowler will be always associated. Immediately the work was sanctioned the plans for extensions to Paddington and to the City were prepared, and the financial support of the Great Western Railway was secured. The construction of these underground railways since those early days has so rapidly developed that a new line of this description now causes but small interest, but it should be remembered that the introduction of the system, at a time when engineering appliances were not so perfect as at present, was accompanied by difficulties which were all but unsurmountable, and it is probable that the execution of works of this nature would have been postponed for a considerable period had not an engineer of sufficient ability been found in Sir John Fowler to superintend the operations. In 1866 Sir John was elected President of the Institution of Civil Engineers, and his address before that Institution, devoted to the subject of the education of an engineer, attracted much attention, it being reprinted and distributed extensively, notably by the Government of India, to the engineers in its employment. When the Suez Canal was almost completed Sir John visited Egypt, and his work in connection with the development of that country is well known. For nine years he made periodical visits to Egypt, and the valuable services he then rendered to her Majesty's Government were so highly appreciated that in 1885 the Queen, on the recommendation of the Marquis of Salisbury, created him a Knight Commander of the Order of St. Michael and St. George. We now come to the Forth Bridge, the best known of all the works with which Sir John Fowler has been associated. So much has already been written on this undertaking that any further description of it would be superfluous. We all know the almost insuperable difficulties that were met with during the construction of the bridge, and how they were all, one by one, overcome. Naturally, no

one man could alone carry out a work of such magnitude, consequently the work of one or two other master minds is clearly discernible in what is, without doubt, the greatest engineering triumph of this century. With the completion of the Forth Bridge, the engineering career of Sir John may be said to have practically finished, and a more suitable termination it is scarcely possible to imagine. Thus closes a long and busy life, a life devoted to the conception and performance of those vast engineering works that have always done so much to materially increase the welfare of a nation.

**MR. JOHN G. LIVESAY.**—We regret to announce the death of Mr. John G. Livesay, A.R.I.B.A., which took place at Ventnor on the 20th ult. Mr. Livesay was the eldest son of the late Augustus F. Livesay, F.R.I.B.A., and had been an Associate of the Institute since 1882, but for twenty years before that date he had practised his profession at Ventnor. In 1884 he was appointed by the Local Board Town Surveyor, and on his resigning that office eleven years later took the position of Consulting Engineer to the Board. During his tenure of office he inaugurated and carried out an extensive sewage system, extended the sea-walls, and undertook several other important public works. In addition to this and to the general practice of his profession, Mr. Livesay was for twenty years manager of the Ventnor Gas and Water Works, of which company he was a director. He was also surveyor to several large properties in the neighbourhood, among which are included the Steephill and Southville Estates, in which, during the term of his agency, great developments have been made. Mr. Livesay was also a member of the following societies:—Meteorological Society (Fellow, 1886); British Association for the Advancement of Science, 1886; Institution of Civil Engineers, 1866; Association of Municipal Engineers and Surveyors, 1873; Surveyors' Institution (Fellow); Associate, Royal Institute of British Architects, 1882.

#### GENERAL BUILDING NEWS.

**CHURCH, DUNDEE.**—A new Established church is to be erected in the Clepington district, Dundee. The building will face Clepington-road and Neishfield-street, and when completed will accommodate about 800 persons. At present it is intended to erect nave and aisle to accommodate 400, with temporary vestry. The church will have a staircase and porch at the west corner and a porch at the east, the stair leading to an end gallery. Entrance to the hall and vestry will be from Neishfield-street. The plan shows nave with one aisle, transepts, and apsidal end, with open timber roof. The architects are Messrs. Johnston & Baxter, Dundee.

**ALTERATIONS TO CHURCH, BULMER.**—The chancel of the old parish church of Bulmer, near Castle Howard, has recently been rebuilt and embellished from the designs of Messrs. Demaine & Brierley, architects, of York. The works comprise rebuilding the south and east walls, the insertion of new decorated travey windows, a new roof of oak covered with lead, new oak chancel seats, altar rails and table, a simple painted oak reredos, and a stained-glass window.

**REOPENING OF SPORLE CHURCH, NORFOLK.**—The re-opening of the parish church of St. Mary, Sporle, which for the past eighteen months has lain closed for the purpose of restoration, took place recently. The principal works have been putting new oak roofs to the nave and north chancel aisle. The roofs have been covered externally with felt and boarding, the lead has been recast and relaid, and new eaves, gutters, and rain-water pipes have been provided. The south nave arcading, with the clerestory above, and part of the north chancel wall, all of which were in an unsafe condition, have been taken down and rebuilt, and the ruined north chapel or sacristy has been reinstated; the stonework, &c., of the chancel arch has been restored, a new arch has been erected between the north aisle and the north chancel aisle; new tile and wood block floors and stone steps to nave and aisles have been provided, the nave walls have been replastered, and all distempered, including the lower stage of tower, and boarding underside of floor to ringers' stage. The total cost of the works, so far as proceeded with, is nearly 2,000l. Messrs. Cornish & Gaymer, of North Walsham, contractors, have executed the restoration from the designs of Mr. Herbert Green, architect and diocesan surveyor of Norwich and Lynn.

**RESTORATION OF TRIMLEY ST. MARTIN CHURCH, SUFFOLK.**—The restoration of this building has been completed. The old roof over the nave and chancel has been removed, and a new structure, composed of pitch pine, has been erected. In addition to this alteration a new doorway has been made directly on to the road in the west side of the tower. The tower has also been restored. The work has been carried out by Mr. Thurman, of Walton, from the plans of Mr. J. S. Corder, of Ipswich.

**CHURCH IMPROVEMENTS, CROFTON, YORKSHIRE.**—The Moorland Church of Crofton, in the parish of Middleton, near Pickering, has recently been improved. The work consisted of reglazing the windows, fixing a painted and panelled wood ceiling to the nave, painting it, and seats and wall panelling, new oak altar rails, providing a new heating apparatus and chimney, and generally repairing the

walls, roof, and fittings of the fabric. The work has been executed from the designs and under the supervision of Messrs. Demaine & Brierley, architects, of York, by Mr. Barnes, of Malton, and Mr. Nicholson, of Barton-le-Willows. The church was reopened by the Bishop of Beverley on the 16th inst.

**FRIENDS' NEW SCHOOL, PADDOCK, YORKSHIRE.**—On the 12th inst. the Society of Friends opened new school premises adjoining their meeting-house at Paddock. The new school communicates with the present meeting-house by two doorways. The assembly-room is 36 ft. long by 30 ft. in width, and a movable platform is provided at the further end. The entrance hall is 10 ft. wide, extends the full width of the school, and contains a staircase leading up to the class-rooms on the first floor. On the ground floor are a kitchen, heating apparatus room, ladies and gentlemen's lavatories, and verandah along the front of the chapel and school. Three class-rooms, secretary's room, and library are arranged on the first floor. The internal woodwork is of pitch pine, varnished; the ventilation is provided by means of inlet ventilators; the rooms are heated by hot-water pipes, and the low-pressure system, and the building throughout is lighted by electricity. The total cost amounts to 1,200l. The architect was Mr. J. Berry, of Huddersfield. The various works have been carried out by the following contractors:—Masons, Messrs. A. & T. Haigh, Carlisle; joiners, Messrs. H. Hollingworth & Sons, Moldgreen; plumbers, Messrs. Sanderson Bros., Paddock; plasterers, Messrs. J. Robinson & Son, Marsh; painter, Mr. R. Heaton, Paddock; slater, Mr. Alfred Bower; concrete, Mr. John Cooke; heating engineer, Mr. J. W. Thornton; electrician, Mr. T. W. Broadbent.

**INDUSTRIAL SCHOOL, STOCKPORT.**—On the 17th inst. Mr. George Whiteley, M.P. for Stockport, opened the new Industrial School for Boys at Offerton. Mr. Briggs, of Stockport, was the contractor, and the architect was Mr. T. H. Allen.

**CATHOLIC SCHOOLS, COWPEN, NORTHUMBERLAND.**—The foundation stone of the new Roman Catholic school in connexion with the village mission was laid at Cowpen recently. The building, which is to be of red pressed brick with stone facings, will be erected by Messrs. Barron & Temple, contractors, Blyth, in accordance with the designs of Mr. A. A. Windle, the architect. In the principal schoolroom the seating accommodation is for 120.

**ST. STEPHEN'S SCHOOLS, WESTBOURNE PARK.**—The additions which finally complete these schools were opened on the 17th inst. The additions consist in carrying over the old building (erected in 1858) a new story of a similar character to that of the newer portion of the schools built in 1869-70, and of some considerable alterations of the older structure necessary for the working together of the old and new schools. In carrying up the new story, only the external walls of the old structure have been raised, forming an L-shaped boys' school room, 56 ft. by 20 ft. in the long arm, and 48 ft. by 24 ft. in the short arm of the L, by about 17 ft. to the collar of the semi-open timbered roof. The internal walls of the old first floor below stairs, so that besides forming one large room, the new floor area is also divisible into three class-rooms with a wide corridor. The interior of this room is finished with stock brickwork and stone mullioned windows, the timber trusses and half timber filling above the screens are all left the natural colour of the wood, while the plaster is finished with wood float. The floor is laid with wood blocks on a steel and concrete floor covering in the old building. A coal lift has been constructed from the old basement up to the new story, the well being utilised for the electric mains. Externally, the old masonry (being badly decayed) has been restored by Messrs. Dreyfus with their patent cement. Other works have also been undertaken at a total cost of 7,000l., exclusive of the cost of the site, architect's fees, and other expenses, the whole scheme having cost about 10,750l. The work has been carried out by Messrs. Rudd & Son, of Grantham, as general contractors; for masonry, the Bath stone firms; brick facings, Messrs. Broad & Co.; red moulded bricks in chimney stacks, Messrs. Wheeler & Sons; green slating, Messrs. Roberts, Adlard & Co.; plumbing, Messrs. Lincoln & Sons; wood block flooring, Messrs. Turpin & Co.; folding screens (to architect's design), Messrs. Peace & Norquay; wrought iron work in railings and gate, Messrs. Walton & Co.; coal lift, Messrs. Waygood & Co.; electric lighting and bells, Mr. W. Mackie; casements, Messrs. Howard & Co.; lead glazing, Mr. Jackson; wood carving, Mr. Taylerson. No work of works was employed, the work being carried out under the direct supervision of the architect, Mr. Arthur T. Bolton, of Westminster.

**BAPTIST CHAPEL, BARRY DOCK.**—The new chapel for the English Baptist Church, Holton-road, Barry Dock, was opened on the 16th inst. The style is Italian Renaissance. The plan consists of ground floor and gallery all round to seat 600 persons. To the rear of the pulpit there are nine class-rooms and minister's room, having access to the basement floors and two exits from the church floor. The basement floor contains a class-room to seat 500 persons and a caretaker's room, and has four entrances from outside, independent of the church



floor entrance. The whole of the work has been executed from the design of Mr. John Morgan, architect, Brynegg, Blaenavon, Mon., Messrs. Lloyd & Tape, Barry Dock, being the contractors. The amount of the contract was about 3,725*l*.

**FREE CHURCH, FORTROSE, ROSS.**—On the 9th inst. the new Free Church at Fortrose was opened. The building is Gothic in style, and the architect was Mr. John Robertson, of Inverness. The church has a nave and transept, with the pulpit at one end and a gallery stretching across the other end. A spire rises to some 112 ft. The principal contractors were:—Masonry, Messrs. McDonald & Son, Inverness; carpenter, Mr. R. M'Lennan, Fortrose; slater, Mr. Gray, Inverness; painting, Messrs. M'Leod & M'Intosh, Inverness; plasterer, Mr. D. Arthur, Fortrose; heating, Messrs. M'Kenzie & Moncur, Edinburgh. The building is to be lighted with acetylene gas, Mr. Allen, Nairn, having this contract.

**DEPTFORD MARKET.**—Sir J. Wolfe Barry, the engineer appointed by the Corporation, has drawn up a report upon the proposed extension of the Foreign Cattle Market, for which an Act was obtained in last Session of Parliament. The cost of the extension, including the cost of the branch railway to the London, Brighton, and South Coast line, and the tramway outside the market, is calculated at 32,250*l*. The estimated expenditure upon other new works amounts to:—Lairage, 21,000*l*.; slaughter-houses, 5,000*l*. (a first instalment); a continuous river frontage of 880 ft., by constructing a junction of the present three jetties, 16,000*l*.; and acquisition of property in the vicinity, 22,000*l*.; the aggregate outlay being about 97,000*l*.

**PUBLIC HALL, LONMAY, N.B.**—A new public hall, which has been erected at Lonmay, was opened on the 11th inst. The hall has accommodation for between 400 and 500. The architect was Mr. Farquhar, Craigellie. The contractors were:—Joiners, Mr. Farquhar, Lonmay; masonry work, Scott & Murray, Lonmay; plasterer work, Mr. Noble, Fraserburgh; and slater work, Mr. Chas. Cranna, Crimond. Mr. James Hendry, Knowsie, was inspector of works.

**COTTAGE HOSPITAL, DUNFERMLINE.**—The Moray wing, which has just been added to this hospital, was opened recently. The architects were Messrs. S. Mitchell & Wilson, Edinburgh.

**THEATRE, LEEDS.**—The Queen's Theatre, Leeds, is being erected for Messrs. Morrell & Mouillot and Messrs. Dottridge & Longden. The builder is Mr. S. F. Davidson, of Newcastle-on-Tyne. The building now in course of erection is situated at the corner of Meadow-road and Jack-lane, and will be faced with red bricks and stone dressings. The dimensions are as follows:—From curtain to back wall of pit, 72 ft.; width of auditorium, 78 ft.; stage, from curtain to back wall of stage, 41 ft.; four exits are provided from the pit, three from the gallery, and two from the dress circle. The plan has been arranged so that one pay office serves for the whole of the house, and the theatre will hold about 4,000. Messrs. W. Hope and J. C. Maxwell, of Newcastle-on-Tyne, are the architects.

**HOTEL, MULLION, CORNWALL.**—A new hotel is being erected near Poldhu Cove, Mullion. Mr. Walter Wood, of Gloucester, has designed the building, and under the direction of Mr. George Williams, clerk of the works, the construction is being carried out by local men, Messrs. George Sons undertaking the masonry and Mr. J. H. Matthews the carpentry. The building has a frontage of 175 ft. and a width of 70 ft. It is practically constructed of rock, hewn out of the beach at Poldhu Cove.

**LIBERAL CLUB, BLACKPOOL.**—A new Liberal Club has been erected at Blackpool. The architect is Mr. Herbert Wade. There are three shops in Victoria-street and three in back Victoria-street. The entrance is at the westerly end of the building. On the first floor are a reading-room, smoke-room, secretary's room, assembly-room, and steward's store-room. The billiard-room and card-room are on the top story. There is also other accommodation upon both floors. The general contractors were Messrs. S. Butterworth & Sons, and the sub-contractors—joinery, Messrs. T. Lawson & Co.; plumbing and painting, Mr. S. Walsh; brickwork, Mr. G. Sparrow; plastering and slating, Mr. W. Walker; electric lighting, Mr. R. Wilkinson; heating and ventilating, Messrs. Dawson & Co., Stalybridge.

**FIRE-ENGINE STATION, CARLISLE.**—On the 7th inst. a new fire-engine station was opened in Spring Gardens-lane, Carlisle. The new station, which has been built by Mr. Bell from plans prepared by the City Surveyor (Mr. H. C. Marks), takes the place of the temporary premises used for some time past in West Tower-street. It consists of an engine house, recreation-room, store-room, lavatories, and bath, apparatus for washing the hose, and a tower about 60 ft. high.

**MUNICIPAL BUILDINGS, MARGATE.**—New municipal buildings have just been opened at Margate. The new buildings occupy a position on the old market site, immediately south of the Town Hall, and divided therefrom by a passage some 16 ft. wide, connecting the Market-place with Duke-street. On the ground floor are the offices of the borough rate collector, the water works department, the sanitary inspector, and toll collector, with a public lavatory. On the first floor is a magistrates' room, a suite of offices for the borough engineer's department, including rooms for the borough engineer, assistant

surveyor and draughtsmen, also a plan room and suite of lavatories for the use of members of the Council, officials, and others having business in the place. This floor is connected with the Town Hall by a passage for the convenience of the magistrates and officials. The door of this covered way opens directly into the Court-room. In the main front of the building an area of 1,400 ft. super is reserved for market stalls, covered by an iron and glass roof carried on light iron columns. The plans were produced in the office of the Borough Engineer, Mr. Albert Latham, and the work has been carried out under contract by Mr. L. Seager, of Sittingbourne.

**GENERAL POST OFFICE, LIVERPOOL.**—The new General Post Office at Liverpool will, it is expected, be opened at Easter. The architect of the building is Mr. Henry Tanner, Chief Architect of the Office of Works. The style is the Italian Renaissance. The front elevation is in Victoria-street; one side flanks Sir Thomas-street, and the other faces Stanley-street. The length of the Victoria-street frontage is 223 ft., and from the street level up to the roof there is a height of 83 ft. Measured from the basement level the height of the five stories is 96 ft. The external ground level is 26 ft. in length. At its Whitechapel end are two openings into the loading yard. The lower part of the yard is open, the upper part next the new building has a glass roof 50 ft. by 178 ft. The vans, probably entering from Sir Thomas-street and Cumberland-street, will draw up at an elevated loading platform, 178 ft. long and 15 ft. wide. The elevation in Sir Thomas-street is 31 ft. in length. The heating work has been carried out by Messrs. Dargue, Griffiths, & Co., Liverpool. Messrs. Henry Johnson & Sons are the contractors for the plastering, concreting, tiling, and granolithic (corridors, &c.), and Messrs. Wilby & Sons did the plumbing and painting. The common brickwork is supplied by the Richmond Brick Company, St. Helens; buff-facing bricks by Ashton Hall Brick and Coal Company; glazed bricks by Dennis, of Ruabon; Messrs. Easton and Anderson supplied the heaters; and Doulton's provided the sanitary appliances. The steel and iron work was executed by Messrs. E. C. & J. Keay, Birmingham; and the wood fittings were supplied by Messrs. Brown & Backhouse, Liverpool; Pearson & Brown, Eccles, Manchester; W. Thornton & Sons, Liverpool; Delaney & Shanks, Birkenhead; and A. White & Sons, Liverpool. The general contractors are Messrs. Thornton & Sons, of Liverpool.

**CALEDONIAN FIRE AND LIFE INSURANCE COMPANY'S OFFICES, LONDON.**—Considerable structural alterations have recently been made at the London offices of this company. The offices are situated in King William-street. The alterations have mainly taken place in the Life Department of the office, and consist of the removal of heavy cross walls and a stone staircase from the ground floor, and the substitution of an internal mahogany staircase leading from the general offices on the ground floor to the secretary's and other offices on the first floor. The new Life office has been refitted with mahogany counters and fittings. The premises have been heated by low pressure hot water, by Messrs. Edwards & Son, of Great Marlborough-street. The general contractors for the works were Messrs. Thompson & Beveridge, of Albany-street, N.W. The alterations were designed and carried out under the personal supervision of Mr. Howard Chatfield Clarke, of Bishopsgate Street Within.

**ADDITIONS TO NAZARETH HOUSE, CARDIFF.**—The extensive additions to Nazareth House, Cardiff, which have been in course of execution for the past few months, are now finished. The additions are situated to the east of the block, with which they are connected by an entrance hall and staircase. They abut upon Colum-road. The additions consist of a block of buildings over 90 ft. in length and 62 ft. in height. The lower floor is devoted to sitting-rooms, dormitories, &c., while the whole of the upper part consists of a chapel for the use of the inmates of the institution. The building is in the Early English style, in harmony with the older portion. The walling is of blue Pennant stone, with Bath stone dressings. The height to the eaves of the main roof is 34 ft., and to the ridge of the gable 62 ft., while the top of the turret is 67 ft. above the ground. The building is in two floors, and the ground floor is 13 ft. in height. It is connected with the old building by a staircase of patent stone, leading to a corridor. Thence turning to the right is a bathroom, a bedroom for the use of the sisters, a visitors' room, and at the end of the corridor a small infirmary abutting on Colum-road. To the left of the infirmary are a cloakroom and domestic offices, and a small bedroom. Beyond this is the old men's sitting-room with windows facing across the gardens in a westerly direction. Opening out of this room is a doorway into the covered space at the end. The old men's dormitory is adjacent. In this room there is accommodation for fourteen beds, and a new dormitory, also abutting on Colum-road, is another room, also for use as an infirmary. At the end of the corridor, running at right angles to Colum-road, is an entrance doorway and staircase for use by the priests. The northern end of the new block is taken up with a covered space for the old men to take exercise and sit and smoke in wet weather. Behind the covered space

is the covered entrance from Colum-road. The whole of the upper portion of the new building is taken up with the chapel, which is 33 ft. wide and 91 ft. long. Though the chapel is for the inmates of Nazareth House, a portion at the lower end will be set apart for the use of the public. At the southern end of the nave is the sanctuary, 30 ft. 6 in. by 21 ft. On the east of the sanctuary is the sacristy, and on the western side, divided from it by two arches and a carved wood screen, is the choir. The capitals of the chancel arches are carved. The roof is of the open-timbered kind, of pitchpine. The floor of the corridor and halls of the lower part of the building are of tiles, and the other rooms are of pitchpine. The floor of the nave of the chapel is of pitchpine blocks, while the floor of the sanctuary is of oak. The architect is Mr. E. W. M. Corbett, and the contractors are Messrs. W. Thomas & Co., whose clerk of the works is Mr. Shelley.

**BANK, LEEDS.**—A new bank has been erected in Park-row, Leeds, for Messrs. Wm. Williams, Brown, & Co. The architects of the new premises were Messrs. Alfred Waterhouse & Son. The block covers an area of nearly 100 ft. by 80 ft. The frontage to Park-row is 80 ft., to Greek-street, and Russell-street about 100 ft. From the street level to a height of 26 ft. the exterior is of polished grey Dalbeattie granite, relieved with courses and pillars of red granite.

The ground floor is of glazed buff terra-cotta. The columns rise to a height of 90 ft. above the street. Double sets of swing-doors give admission to the bank, a lofty apartment, lined throughout with faience from the Burmantofts branch of the Leeds Fire Clay Company. The colour scheme is light buff, relieved with brown and blue, whilst the capitals of the pilasters are in gold. The counter is 70 ft. long. The managers' rooms are at the rear. In the basement, covering an area of about 75 ft. by 50 ft., are the strong rooms. These have arches of firebrick, upon which rests solid concrete 4 ft. in thickness. The floor is likewise of concrete. The bullion-room is fitted out with hardened steel plates. A self-locking lift conveys the bullion, books, &c., from the bank to the strong rooms beneath. A large luncheon-room and other accommodation are provided for the staff in the basement. On the upper floors of the building are suites of offices, some fifty rooms in all. Strong rooms are also provided. The entrance to these upper floors is in Greek-street, and they may be reached both by staircases and by a lift. The various contracts have been executed by the following:—Excavations and concrete foundations, Mr. S. Macfarlane; builders and joiners, Messrs. Armitage & Hodgson; smith's work, Messrs. John Butler & Co.; plumbing, Messrs. H. Bratthwaite & Co.; plastering, Messrs. F. S. Mountaine & Son; slating, Messrs. Watson & Worsnop; stairs, &c., Mr. Alfred Walker; painting, Messrs. Frederick Jackson & Co.; granite work, Messrs. Newall, Dalbeattie, N.B.; terra-cotta, the Burmantofts Company; ivory-glazed bricks, the Farley Iron Company, Limited; salt-glazed bricks for strong rooms, Messrs. Wm. Ingham & Sons; desks and fittings, Messrs. Marsh, Jones & Cribb; ornamental ironwork, Messrs. Hart, Son, & Peard, London and Birmingham; wood-block flooring, Messrs. Illingworth & Co.; strong rooms, the Ratner Safe Company, London; passenger lift, Messrs. R. Waygood & Co., London; electric lighting, Messrs. Belshaw & Co., London; ventilators, Mr. Wm. Towler; heating apparatus, Messrs. Johnson & Son, ironmongery, Mr. James Gibbons, Wolverhampton. Mr. Wm. Bruce was the clerk of works.

**NORTHERN COUNTIES STATION HOTEL, BELFAST.**—This hotel is now open for the reception of visitors. It contains coffee, drawing, writing, and smoking rooms, with baths and lavatories, together with some twenty-seven bedrooms, all upon two floors. Messrs. M'Laughlin & Harvey erected the main building, and the internal woodwork and painting were done by the Company's own workmen, under their works foreman, Mr. Farr. The hall is entered off the platform. It is laid with white Sicilian marble tiles, and the tiling of it was executed by Messrs. W. R. Wilkinson & Co., Limited, Newcastle-on-Tyne, who also did the concrete and marble staircase. To the left on entering is the coffee-room, which is capable of accommodating about sixty people. The entire decorations—with the exception of those in the coffee-room and on the staircase, which were carried out by Messrs. George Morrow & Sons, Belfast—were executed by Messrs. May & Co., Limited, of London, who also supplied the furniture throughout the hotel. There is electric light installation through the establishment. It was erected by Messrs. W. Coates & Son, Limited, Belfast, while the fittings were supplied by three London firms, viz., Messrs. Benson & Co., Faraday & Son, and Taylor & Tucker. The planning and gasfitting were done by Mr. A. Lowry of Belfast. The building was designed by Mr. B. D. Wise, under whose personal supervision the work was carried out.

**NEW HAMMERSMITH THEATRE.**—The new Hammersmith Theatre of Varieties is situated in King-street, at the corner of Mansion House-street. The frontage of King-street is 100 ft. long, and the Theatre is 100 ft. wide, and is executed in Douling stone and red-brick facings, with a feature over the main entrance of an illuminating tablet in a deeply-



recessed arch, spanning the whole width of the entrance, at the lower part of which is a shelter, under which is the entrance to a crush-room, which is 18 ft. by 14 ft. and 10 ft. high, with a wall tiling in faience. The greatest difficulty the architect had to contend with was the extreme narrowness of the old building site, which was only 40 ft. A foyer on an elevation has been provided in the balcony tier, with two promenades the whole length of the building. The lighting is by electricity. The stage is 36 ft. deep. The buffet bar in the rear of the pit and on the balcony tier is fitted in the Flemish style, of Austrian oak. The whole length of the theatre is 108 ft., the width through 40 ft., and the grid is 48 ft. above the stage. The stalls are approached from the crush-room through a barrel-domed corridor, and there are emergency exits in Mansion House-street. The work has involved an expenditure of 30,000l. The general contractors were Messrs. Godson & Sons, of Kilburn. The decorations and fibrous ceilings and walls were carried out by Messrs. De Jongh, from special designs prepared by the architect. The ventilation was by Messrs. Boyle & Co., the heating by Messrs. Rosser & Russel, the electric lighting by Messrs. Vaughan & Brown, the stage by Mr. Cawdrey, the fittings by Messrs. Brown & Co., of Hoxton, and by Mr. Wm. Rowe, of Clapham. The architect was Mr. W. M. Brutton, of Trafalgar-square.

#### SANITARY AND ENGINEERING NEWS.

**THE HIGH PEAK WATER SCHEME.**—The reports of the Leicester Water Committee, and the engineers and experts, with respect to the proposal to acquire the waters of the Derwent and the Ashop, for Leicester, have been circulated. The Water Committee consulted Mr. J. B. Everard, C.E., their engineer, Mr. R. E. Middleton, C.E., and Mr. G. F. Deacon, C.E. All are agreed upon two points. That an additional supply is urgently needed, and that the ideal supply, alike to quantity and quality, is to be obtained from the Derwent and the Ashop. The Water Committee have accordingly declared in favour of a scheme which will entail a total outlay of 1,500,000l., and provide a supply of over thirty million gallons a day. The Water Committee commend that a clause should be embodied in their bill giving Derby the option of joining a joint board, and enabling them and other authorities near the line of aqueducts the right to obtain water in bulk at a fair price. They propose that at the outset 1,500,000l. should be spent on the first instalment of the work. *Sheffield Independent.*

**UPTON ASYLUM, CHESTER.**—We have received some further particulars as to the warming and ventilating of this building, of which we gave some particulars on page 439. The Plenum system has been employed; and each of the patients' blocks and the recreation hall are arranged with separate fans and motors, so that any block may be worked at will. The fans are driven by electric motors, and are easily speeded to high, low, or intermediary speeds as required, according to the exigencies of the weather. The heating surface is placed in chambers, or vaults beneath the various dormitories, wards, or single rooms, and the air is blowing over these in winter time, so that it is warmed to a temperature of 80 to 90 deg. Fahr. before it is allowed to pass into the various rooms to be warmed and ventilated. By this system it is impossible to get warmth without having ventilation. The basis of the supply of air is taken as 1,250 to 1,500 cubic feet of air per patient, and the hot-air inlets are about 8 ft. to 9 ft. from the floor level, and the extraction is at the floor level. The heating is done by low-pressure steam worked at not more than 5 lb pressure throughout the whole of the building. The steam is generated in one, two, or three boilers, each boiler being 28 ft. by 7 ft. diameter (Lancashire type), and carrying 120 lbs. working pressure. This steam is conveyed in a 9-in. diameter pipe to the pump-room. From thence it is taken to the electric-light engines at this pressure (120 lbs.), and passed through the engines, the exhaust being taken to a special receiver, from which all the waste heat of the steam is separated. The steam is then sent into the low-pressure pipe, and carried throughout the whole building for heating the buildings, or the hot water services. When there is not sufficient exhaust steam, the plant has been so arranged that live steam will come through into the low-pressure main at the working pressure of 5 lbs., supplying the make-up heaters when necessary. Thus there is practically no waste going on, the whole of the condensed water being returned into an automatic receiver, and being pumped into the boiler, to be used again. The returned water is at a high temperature, and often reaches over 200 deg. Fahr. The hot water services to the various blocks are procured by separate heaters being placed in the basement of each block, and through which the exhaust steam passes, thus heating the water to a high temperature for all kinds of domestic purposes. The work has been done by Messrs. Ashwell & Nesbit, of London and Leicester.

#### STAINED GLASS AND DECORATION.

**WINDOW, BRADFORD UNITARIAN CHURCH.**—A new stained glass memorial window has been added to this church, the subject being the Parable of the Seeds. It is the work of Messrs. Powell Bros., of Leeds.

**WINDOW, PARISH CHURCH, BRIGHTON.**—A small new painted glass window has been erected in the parish church of Brighton, by subscription, in memory of the late Frederick Beal and his wife. This window is on the right hand side of the main entrance of the church. The window contains a figure of St. Nicholas, as the Saint to which the older and former parish church is dedicated. The window was by Mr. C. E. Kempe.

#### FOREIGN.

**FRANCE.**—M. Bonnat has been appointed Vice-President of the Municipal Committee for the 1900 Exhibition in place of M. Pavis de Chavannes, and M. Detaille has succeeded to the late painter's place in the Conseil Supérieur of the Ecole des Beaux-Arts. M. Botté has been commissioned to make a model of the new lookplate which are to replace the ancient work of the same class in the Palais d'Orsay, with their emblem of the First Empire. The new lookplate will have a head of the Republic surrounded with laurels and with the letters "R.F." Whatever the talent of the artist, it is most regrettable that the history of the building should be effaced in this way. The "Société Populaire des Beaux-Arts" has started a subscription to raise a monument to Viollet-le-Duc. At the National Art School at Lyons a special course is to be established for instruction in decorative design as applied to textiles. Two monuments are to be raised to the memory of Delibes (a musical composer little known out of France), at la Flèche and at St. Germain-du-Val (his native place). The first will be designed by M. M. Maillol, the second by M. Charrier-Beyl. The double inauguration will take place in May next year. The Municipality of Paris, in co-operation with the "Vieux Paris" Committee, is taking measures for the strengthening and preservation of the fine windows in the churches of Saint Severin, St. Médard, and St. Gervais. The steam tramway from the Luxembourg Gardens to Aragon is to be prolonged to Etampes. The new hospital at Tunis is to be opened in a few weeks. It is planned and designed by a young pupil of the Ecole des Beaux-Arts, M. Jean Resplandy, now a Government architect of Tunis. The death is announced, at the age of eighty-two, of the landscape painter Bellef, originally a pupil of Justin Ouvrier and of the Ecole des Beaux-Arts. For many years he exhibited pictures of Italian and Oriental landscape, and the Luxembourg possesses a fine charcoal drawing by him of the Valley of St. Amé in the Vosges. He executed, for the Hôtel de Ville of Paris, a view from the bridge at Champigny. M. Bellef had unfortunately been blind for some years before his death.

#### MISCELLANEOUS.

**THE REBUILDING OF KEW BRIDGE.**—Adverting to our "Note" of October 22 (p. 358 ante) and our recent announcements on this matter (pp. 415 and 467 ante) we find that the County Councils of Middlesex and Surrey have jointly drafted a Bill, for introduction next Session, whereby they seek to amend and extend the powers of that Act upon the Councils, for the purpose of the works authorised by the Act, and to provide for the increase of the amounts which they have authority to borrow. The Bill, if passed, will therefore, it appears, remove the difficulty presented by the amount of Mr. E. Gibb's tender. The two Councils have already agreed to proceed with the work upon the basis of that tender, at 150,000l. Mr. Gibb's original tender was for 169,238l., and Sir J. Wolfe Barry, whose estimate came to 118,000l., has calculated that from 20,000l. to 25,000l. might be saved by substituting internal brickwork or concrete for stonework.

**BIRMINGHAM MASTER BUILDERS' ASSOCIATION.**—The annual meeting of the Birmingham Master Builders' Association was held on the 17th inst. at the Grand Hotel, Mr. J. Bowen presiding. The annual report, presented by the Chairman, stated that the committee were able to record that the period of good trade, mentioned last year, had continued. With increased prosperity in the building trade there had been increased competition, in many cases the advance in contract prices obtained being insufficient to cover increased cost of material and labour. A notice had been received from the bricklayers asking for alterations in rules and a rise in wages to 10d. an hour. That notice would receive the careful attention of the committee, and it was felt that uniform working hours must again be secured. It had become year by year increasingly evident that to successfully combat the ever-growing demands of the operatives, it was necessary that they should be dealt with by an amalgamation of towns rather than by individual associations. Federations of employers having been established in Lancashire and Cheshire and in the West of England, and the attention of the National Association having been drawn to this great need, England and Wales had been divided into four federation areas. The committee had had under their consideration the new regulation of the Public Works Committee of the City Corporation, that before making connexions to the sewers a deposit

should be made to cover the cost. A deputation waited upon the Public Works Committee and endeavoured to obtain some modification of this arbitrary requirement, but they regretted to report that their efforts were unsuccessful. The Chairman congratulated the Association upon the progress that had been made. The membership had increased during the year from sixty-nine to ninety-three. The desirability of every builder in the district joining the Association could not be too strongly insisted upon, especially in view of the formation of the Midland federation. Now the Birmingham radius had been extended he hoped builders in the outlying districts would see their way to join the Association. With trade societies taking up a strong position, and constantly federating, it would be impossible for them as employers to hold their own unless they took united action. The following officers for the ensuing year were reappointed:—President, Mr. J. Bowen; Vice-President, Mr. F. G. Whittall; Treasurer, Mr. G. Twigg; Secretary, Mr. E. J. Bigwood. The Secretary, in acknowledging his appointment, stated that financially the Association was in a better position than ever it had been. The total receipts amounted to 7311l., and after all liabilities there was a balance of 172l. He regretted that more consideration was not shown to the trade by the City Council, and he thought their only remedy was to return a practical builder to the Council.

The meeting then terminated. The annual dinner was held in the evening at the Grand Hotel, Mr. John Bowen presiding. After the usual loyal toasts had been honoured, Mr. C. H. Barnsley gave "The City and Trade of Birmingham." Alderman Edwards, who replied, spoke of a prophecy which was made to him forty years ago to the effect that within the ensuing twenty-five years Birmingham would be half rebuilt. It had turned out to be perfectly true, and it might have been repeated with equal truthfulness many a time since; in fact, Birmingham was still in the course of being rebuilt. He had been reported as saying that within his recollection the particular district in which he spoke had gone up 50 per cent. in value; but what he did say was that it had gone up 50 per cent. within the last ten years. In responding to the toast of "The Association," which was submitted by Mr. W. Hale, the President said they did not combine simply to advance prices to an unreasonable extent, but to uphold their rights and privileges. The time had come when the builder should be regarded as equal to the member of any other trade or profession. Speaking of trade unions, he recognised the good which they did for the worker, but expressed the opinion that the time would come when they would reach the limit of concessions which the masters could safely grant them. The federation which the workers had established had made a similar movement of the employers necessary, and the Master Builders' Association of Great Britain had taken up the matter and formed four federations. That of the Midlands would embrace eleven counties and the whole of North Wales, and it was hoped that it would be in working order during the year. He hoped that the difficulties which lay before them would be dealt with in a conciliatory spirit. Other toasts followed.

**THE CHEMISTRY OF ACETYLENE.**—On Monday evening last Professor Vivian B. Leves delivered the first of a course of four Cantor lectures on "Acetylene" before a large audience at the Society of Arts. The lecturer briefly related the history of acetylene from the time of its discovery to the present date, and described the methods by which acetylene may be synthetically prepared, and finally discussed the chemical and toxic properties of the gas. Referring to the action of acetylene upon brass and other copper alloys, Professor Leves said that experiments which had been made in Berlin and France showed that pure acetylene had practically no action upon these alloys, but that when the gas contained ammonia as an impurity, there was some danger of the explosive acetylides of copper being formed when allowed contact with fittings composed of copper alloys. Unalloyed copper should never, of course, be employed for acetylene gas fittings. The lecture was illustrated by several striking experiments demonstrating the behaviour of acetylene under various conditions.

**EXAMINATIONS IN BUILDING AND SANITARY CONSTRUCTION.**—The Carpenters' Company announce two examinations in the above-named subjects, intended to be suitable for clerks of works, builders, foremen, and others who have to deal with the construction of buildings. They are to be held on Thursday and Saturday, December 1 and 3. The board of examiners consist of Colonel Stanley Bird, Professor A. Wynter Blyth, Professor Danister Fletcher, Professor Henry Robinson, Professor T. Roger Smith, Mr. John Willson (Warden of the Company), Mr. Howard Collis, Mr. Stanton W. Preston, and the Presidents of the Institute of Architects, the Architectural Association, the Institute of Builders, and the Clerk of Works Association. Particulars can be obtained from the Clerk of the Carpenters' Company, Carpenters' Hall, London Wall.

**THE REGISTRATION OF PLUMBERS.**—On the 18th inst. a conference of representatives of various bodies interested in a Plumbers' Registration Bill was held in the Carpenters' Hall, London-wall, E.C. The conference was convened by the National



Association for the Promotion of Technical and Secondary Education, with the object of considering under what conditions the Plumbers' Registration Bill of last session would be acceptable to all the parties interested. Mr. S. W. Preston (Master of the Carpenters' Company) presided. After considerable discussion, the following resolutions were passed, it being understood that they were passed without prejudice to the question of whether any Bill for the national registration of plumbers be introduced or not:—"Resolved, that if a Bill be introduced it should provide that these will be placed upon the Registration Council (a) directly appointed representatives of local municipal authorities aiding plumbing classes, and (b) an adequate number of directly appointed representatives of teaching institutions and of such additional organisations as are specially interested in the education and registration of plumbers, including the following, amongst others, City companies connected with various sections of the building trade: the Sanitary Institute, the Royal Institute of Public Health, the Royal Institute of British Architects, the City and Guilds of London Institute, the Institute of Builders, London Polytechnic Council, and the Association of Technical Institution." "That the Registration Council be instructed to accept, as qualifying for registration, the certificate of such public examining body or bodies approved by a Government Department, and that such acceptance be not withdrawn without due notice nor without the consent of the Department concerned." "That only a small fee for registration be charged to operative plumbers, and that the Registration Council shall not remove from the register any operative plumber nor thereon solely by reason of his failing to pay a subsequent fee." "That the examination for the purposes of registration should test the candidate's general knowledge of other sections of the building trade in addition to their special knowledge of plumbing." "That in any Bill, the Council created by the Bill should be the actual managing body, and have direct charge of the registration, and, further, that the conduct of the Bill should not be left in the hands of any one body."

**BOARD SCHOOLS IN LONDON.**—On October 28 the School Board for London opened at Rotherfield-street, Islington, their 431st completed school, in providing for the needs of the 514,000 children in London. The Board have just framed their schedule of sites to be taken for additional schools during the next twelve months. The gross total of the new sites is seventy-five, yet, inasmuch as ten of these are "alternative sites" for five schools, the net number is seventy. Taking a mean between each pair of alternative sites, we find that the aggregate area of the several premises and parcels of land—which range between 615 square feet (No. 50, White Lion-street, Clerkenwell) and 115,260 square feet (Spurlees-road, Deptford)—amounts to nearly 42 acres, of which about 26 acres is garden or other vacant ground. The seventy-five sites in question are situated in the various divisions thus:—City (1)—Stoney-lane\*, adjoining Gravel-lane Board School, Chelsea (5)—Newcombe-street, Edinburgh-road\*, and St. Mark's-grove, Kensington Parish; Cobbold-road, and Elmington-gardens, Hammersmith, Pinner, and "Kingsgate," St. Cuthbert's-road, Kilburn, Southwark (3)—Alexis-street, Bermondsey\*; Hatfield street and Broadwall, Christchurch Parish; and West-square, St. George-the-Martyr Parish. Tower Hamlets (12)—Christian-street and Grove-street; and Cable-street, St. George's-in-the-East; Trinity Chapel, with its school and houses, Hanbury-street and twenty-one houses and yards in Hanbury-street and Old Montague-street, Mile End New Town; Redman's-road, Mile End Old Town; Aston-street and Condon-street, and Northey-street, Limehouse; High-street\*, and Marner-street, Bromley; Broad-street, Ratchiff; nine houses in Pigott-street, Poplar; and thirteen houses, forecourts, &c., in Ricardo, Southill, and Upper North streets, Poplar.

**GLASGOW ARCHÆOLOGICAL SOCIETY.**—The forty-second annual general meeting of the Glasgow Archaeological Society was held on the 17th inst. Mr. David Murray, LL.D., President of the Society, occupied the chair. The annual report was read.

\* Those sites marked with an asterisk adjoin existing School Board premises.

It stated that during the session six meetings had been held and a number of papers read. The number of members admitted in 1897-98 was twenty-one. The Council regretted that the committee had not yet been able to complete the Society's report on the investigations on the line of the Antonine Wall; they were hopeful, however, that it would be issued during the present session. The Chairman moved the adoption of the report, which he said showed that the Society was doing good work, and that there was much life in it. The report was adopted. Office-bearers were then elected. Archbishop Eyre was to have been present to read a paper on "The Preservation of Scotch Ecclesiastical Monuments." In his absence it was read by Mr. J. D. Duncan. His Grace said that in the year 1392 Bishop Bar, who had presided over the see of Moray for thirty years, wrote to King Robert III. that he was broken down with the infirmities of age and so far reduced in circumstances as to be scarcely able to maintain a slender household. In the most touching and solemn words he complained that on the Feast of St. Bonolph, 13th January, his own brother, the Earl of Buchan, known as the Wolf of Badenoch, had descended from the hills with a band of wild Scots, and given the magnificent Cathedral of Elgin to the flames, and he besought the royal help to compel the incendiaries and malefactors to restore the church "that was a specimen of the magnificence of an honour to the realm, a delight to strangers, and the foreigners who came to see it, a praise and boast among foreign nations, lofty in its towers without, splendid in its ornaments within, and famous for the pious worship of God." In like manner might they plead, not indeed for the restoration, but for the preservation of the architectural ornaments remaining in Scotland. The Society had been established for the study of ancient monuments and for their preservation. Confining his remarks to the larger churches and ruins still remaining, he said he had good but simple examples of early work at Jedburgh, Kelso, Fearn, Fluscardine, Cambuskenneth, Deir, Sadale, Ardchattan, and Oronsay. He called attention to the Scotch ecclesiastical ornaments that remained from the years 1060 to 1500, a period of 500 years; but confining himself to the cathedrals, abbeys, and priories, the cathedrals of Scotland were thirteen in number. Glasgow and Kirkwall were the only two remaining in a more or less complete condition. Of the other eleven, five were now in use as a matter of convenience, namely, Brechin, Dornoch, Dunblane, Dunkeld, and Lismore. Six were only ruins, though Whit-horn was used as a parish church until 1822. They were ruthlessly dealt with in the past. It was the place and the privilege of his hearers to protect them from further injury, for they called for their care on account of their archaeological interest and the interest in the existing ruins he suggested that the members of the Society and antiquaries in general should spend their holidays in making a round of the Benedictine houses.

**SLATE TRADE.**—The financial statistics for 1897 recently issued show the largest output ever recorded, an increase in value of over 300,000. The export trade also shows an increase, principally to Germany. Trade continues brisk and the increased output will no doubt greatly check the importation of foreign slates. The Festiniog quarry owners have decided to retain the present terms, and it is anticipated that the Government quarry owners will not make any material changes.

**COMMONS PRESERVATION SOCIETY.**—A meeting of the Executive Committee of the Commons Preservation Society was held at 1, Great College-street, Westminster, S.W., on Monday afternoon, under the presidency of the Right Hon. G. Shaw-Lefevre. It was reported that since the last meeting of the Committee, two actions in which the Society was interested had been satisfactorily decided by the Court of Appeal. The first referred to a prosecution, instituted by the Lord of the Manor, against a labourer for cutting underwood upon a turf fuel allotment set out under an Enclosure Act at Egloskerry, in Cornwall. It had been held by the Appeal Court that the lord had been fully compensated for all his interests in the enclosed common by the allotment made to him and that he had no part or share in the fuel allotment, the soil of which was held to be vested in the churchwardens and overseers of the parish. The second action was with respect to Town Green Common at Llanfaely, in Anglesey, 1,300 acres in extent, upon which it was sought to erect an explosives manufactory. An injunction, confirmed by the Court of Appeal on Friday last, had now been obtained, together with a declaration of the rights of the commoners, which would save the Common from the possibility of further encroachments. It was stated that the War Office had purchased Donyland Heath, near Colchester, for the purpose of a rifle range. The Society had appealed to the Department to make by-laws under the Military Lands Act, 1893, so that when the land was not in actual use for military purposes it should remain open to the public as heretofore, and they asked that a recreation ground should be given to the Donyland Heath, an exceptionally beautifully wooded open space, was the only land in the district available for purposes of recreation. The

enclosure of a large portion of Studland Heath, Dorset, alleged to be land subject to rights of common, also occupied the attention of the Committee, and a report was instructed to be drawn up upon the matter. The proposal of the Bournemouth Corporation to introduce a Bill into Parliament with respect to the large open spaces formed by the Christchurch Fuel Allotment was further considered, and the Committee endorsed an alternative scheme which had been submitted to the Corporation by the Society's solicitors by which the greater portion of the land would be regulated as an open space. An alleged public footpath in the parish of Cleeve Prior, Worcester, had been obstructed. The County Council appointed a committee which held an exhaustive local inquiry and reported that dedication had been proved. As a result, the Council unanimously determined, on June 13 last, to protect the rights of the public in the disputed path.—Upon the motion of the Chairman, seconded by Sir William Vincent, Bart., a hearty vote of thanks was accorded to Mr. Edward North Buxton, one of the members of the Society, for his recent munificent gift of an additional twenty-eight acres of land at Yardley Hill, Epping Forest, to the Corporation. It was stated that the Society was advising Local Authorities and private individuals in upwards of fifty cases of encroachments upon common land, open spaces, roads, commons, and lanes of rights of way in different parts of the country.

**ABERDEEN MASONS AND GRANITE CUTTERS UNION.**—On the 21st inst. Mr. James Souttar, architect, gave an admirable lecture to this Union on the general history of architecture and the characteristics of the various historic styles. In conclusion he said that the speaker had tried to interest his audience in study which might give them much pleasure and make the world a field of interest and inquiry to them. He advised his hearers to travel as much as possible, and for their encouragement told how, with a few hard-earned savings, he had taken his knapsack on his back and his sketch-book over his shoulder, and once again wandered over the country which some of them had only read about. He should like to think that he had said something to encourage his hearers to go and do likewise.

**LECTURE ON THE MONASTIC BUILDINGS OF EXETER.**—Mr. Harbottle Reed has been doing good service in calling the attention of the inhabitants of Exeter to the archaeological interest of their city, in a lecture delivered to the Exeter Literary Society last week on "The Old Monastic Buildings of Exeter." The lecture appears to have been a very complete survey of the ancient remains or sites of this class of monuments in Exeter, and may arouse in some of the inhabitants a new interest in their city.

**EAST LONDON WATER SUPPLY.**—The extension of supply in the East London district began on Tuesday in the following localities: Walthamstow, Leyton, Whitechapel, St. George's-in-the-East, City of London, and part of Wapping. To-day (Saturday) the supply will be extended in East Ham, Bethnal Green, Shoreditch, North Woolwich, and Hford; on Monday to West Ham and Hackney; on the 30th inst. to Wanstead, Woodford, Mile End, and part of Bow; on December 3, Loughton, Chingford, Chigwell, Buckhurst Hill, and the rest of Limehouse, and Poplar. Hitherto the water has been turned on for two periods, morning and evening. On the dates named it will be turned on at the same time, but will run continuously without any intervening cessation. This extension, which is the prelude to complete restoration of the constant supply, comes exactly three months after the original breakdown.

## CAPITAL AND LABOUR.

**SUNDERLAND SLATERS ON STRIKE.**—About sixty five slaters employed in the building trade at Sunderland have come out on strike for an advance of wages, their demand being for 10d. an hour instead of 9d. The masters offered 10d. for the winter's quarter, extending from the middle of November to the middle of February, when they proposed to revert to 9d. The men could not see their way to accept either this offer or a code of rules which accompanied it.

**THE MASONS' DISPUTE, SWANSEA.**—The masons who left work at the Swansea Docks have now resumed work. When the matter in dispute was fully considered by the Union branch it was found that the action taken by the men was unjustified, and they were ordered back to work. Eleven out of the fourteen have complied with the order, the other three finding employment elsewhere.

## LEGAL.

### ANCIENT LIGHTS CASE

PACKHAM v. HANKINS.

At the Bristol County Court on the 15th inst., the case of Packham v. Hankins was heard. Mr. Vachell (instructed by Mr. T. D. Sibby) appeared for the plaintiff, and Mr. Weatherly (instructed by Mr. Gerard Mosely) represented the defendant.

Mr. Vachell said it was really a High Court case, but it had been decided that the matter should be tried by his Honour, and the parties had signed a



consent to jurisdiction. It was an action to recover damages and also to obtain an injunction, because it was contended that the defendant had interfered with and had obstructed the ancient lights of the plaintiff's premises. The plaintiff was Mr. Leonard Packham, a silk mercer and draper, occupying 32, 33, 34, and 35, Wine-street, and the defendant was Mr. Samuel Hankins, who was building premises under a building grant at No. 31, Wine-street. Under the Wine-street improvement scheme the Corporation set back the fronts of several of the houses. Under a contract the defendant was to be the owner of 31, Wine-street, and he had taken the opportunity of placing upon the site a much more important building than the one that formerly occupied the place. Plaintiff complained that certain walls had been raised in such a way as to affect the light in the well, and to cause a serious diminution of light in the windows.

In reply to his Honour, Mr. Weatherly intimated that he was going to say that the land in question had been taken by the Corporation for purposes of street improvement, and though it did not need an Act of Parliament to give them power to build upon it, the Act did give them power to do that which they could not do but for the Act, namely, to infringe ancient lights, so long as they carried out the purposes of the Act in a reasonable manner. The plaintiff's remedy was against the Corporation, under the Land's Act, and not against the defendant.

The plaintiff stated that the defendant had erected the premises on 31, Wine-street, at a higher elevation both at the front and back. It was the height of the back wall that he complained of chiefly. Several of his lights were interfered with, and witnesses would be put to an extra expense for artificial light.

Mr. Henry Williams, architect and surveyor, said that the back wall had been carried up above the coping 12 ft. or 13 ft., seriously damaging the plaintiff's lights.

For the defence, Mr. Frank W. Wills, architect, was called, and he expressed the opinion that the amount of light taken away was not sufficient to appreciably damage the plaintiff's premises.

Cross-examined: He admitted that he had not visited the premises before the alteration.

Mr. Vachell contended that, in view of the structural character of the premises, the plaintiff ought to have all the light he was entitled to, and that any diminution must be material.

His Honour, in giving judgment, said he did not think there had been any substantial or appreciable diminution of the plaintiff's lights. He did not think that anything that had been done by the defendant had depreciated by one penny piece the letting or selling value of the property occupied by the plaintiff. There must, therefore, be judgment for the defendant with costs.—*Bristol Times.*

#### ILLUMINATED PUBLIC-HOUSE SIGNS.

Mr. Henry Emanuel, proprietor of the "Buttercup," in the Brompton-road, was summoned at Westminster Police-court on Tuesday by the Metropolitan Council for unlawfully extending without permission a projection, namely, an illuminated sign beyond the general building line, contrary to the London Building Act of 1894. The structure complained of, a semi-circular iron framework filled in with ornamental glass, advertising the saloon bar and billiard-room, was erected at a height of 8 ft. above the pavement. The projection, which extended more than 10 ft. over the highway, contained fourteen gas jets for illumination. The attention of the Council had been drawn by the Kensington Vestry to the defendant's sign, which they considered most objectionable.

In defence it was said that the illuminated framework only replaced an old unsafe one which projected further. Moreover, it did not project as far as the lamps of some of Mr. Emanuel's neighbours. Mr. Marshall said the projection must be removed. He imposed a nominal penalty of 40s. and costs.

#### DISPUTE AS TO WAGES.

At the South Wales Police-court on the 22nd inst., before Mr. Paul Taylor, Mr. Edwin Bell, builder, of Aldgate-avenue, City, and 47 and 53, Old Kent-road, a member of the Court of Common Council, was summoned by seven carpenters for balance of wages and an hour's pay in lieu of notice.

Mr. Myers appeared for Mr. Bell, and said great evidence had been given in the Press to these summonses, and he was anxious that his side of the question should be heard. Whatever the result of the summonses was, however, the men should be paid the amount of their claims, although Mr. Bell's contention was that he had already paid the wages which were due.

Edith Scott, the first woman workman, was employed by Mr. Bell, who was erecting some shops at the Old Kent-road. On Monday, the 14th, he and the other men were not started, and three hours after Mr. Bell came and told them and the foreman to get off the premises. He claimed wages for the three hours of waiting and an hour's pay in lieu of notice, but some of the others were not paid their full amount on the Saturday.

Cross-examined: He did not know that the foreman had a contract with Mr. Bell to do all the carpentering work, and that he was paid the full sum on the Saturday for the carpenters' wages.

Mr. Paul Taylor: There is the fact that the men were told to go by Mr. Bell himself.

Mr. Myers said his client only desired to act fairly and honourably. He had found that he had paid more wages than was proper for the labour done.

Mr. Paul Taylor said the men were clearly entitled to be paid, and he thought they should be given something for their expenses.

The cases were adjourned for a short time, and then the men stated they had been paid the full amount of their claims and something for their expenses in addition.

The summonses were then withdrawn.

Mr. Bell stated he had been subjected to considerable annoyance since the granting of the summonses. Two men had endeavoured to assault him, and some malicious person had cut the main water-pipe and flooded the foundations of four boardings in the Old Kent-road as follows:—"Carpenters wanted"—no pay.

Mr. Paul Taylor said he would send a person to prison who was found guilty of such offences.

#### MEETINGS.

FRIDAY, NOVEMBER 25.

*Architectural Association.*—Mr. Paul Waterhouse on "Criel and Bay Windows." 7.30 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. W. C. Tyndale on "House Drainage." 8 p.m.

SATURDAY, NOVEMBER 26.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection of the Sewage and Destructor Works, Ealing. 2.15 p.m.  
*London and Provincial Builders' Foremen's Association.*—Memorial Hall, Farringdon-street, E.C.1.—7.30 p.m.

MONDAY, NOVEMBER 28.

*Surveyors' Institution.*—Continuation of discussion on Mr. W. Eve's paper on "Compensation Values of Cattle Food."—Chemist's Hall, 2 p.m.  
*London Institution.*—Sir Wyke Baylis on "Art—Contra the World, the Flesh, and the Devil." 5 p.m.  
*Sanitary Institute (Lectures for Sanitary Officers).*—Demonstration of Book-keeping as carried out in a Sanitary Inspector's Office, by Mr. A. Taylor. 8 p.m.  
*Society of Arts (Cantor Lectures).*—Professor Vivian B. Lewis on "Acetylene." 11 p.m.  
*Leeds and Yorkshire Architectural Society.*—Mr. J. Tweedale on "A Cruise in the Eastern Mediterranean" illustrated. 6.30 p.m.

TUESDAY, NOVEMBER 29.

*Institution of Civil Engineers.*—Mr. Stanley Robert Kay on "The Effect of Subsidence due to Coal Workings upon Bridges and Other Structures." 8 p.m.  
*Northampton Institute.*—Clerkenwell Lectures on Architecture.—Mr. F. Bond on "Vaulting." 8 p.m.

WEDNESDAY, NOVEMBER 30.

*Society of Arts.*—Mr. C. H. Bothamley, F.R.S., on "Photographic Developers and Development." 8 p.m.  
*Edinburgh Architectural Society.*—Mr. R. S. Lorimer on "Scott Gardens, and the Treatment of the Garden in Relation to the House." 8 p.m.  
*Northern Architectural Association.*—The Rev. Canon Savage on "Durham Cathedral." 7.30 p.m.  
*Liverpool Engineering Society.*—Mr. J. Denholm Young on "The Basis of Propeller Design." 8 p.m.

THURSDAY, DECEMBER 1.

*Society of Antiquaries.*—8 p.m.  
*Engineers' Hall, London.*—Building and Sanitary Construction Examination (written), Carpenters' Hall 5 p.m. to 9.30 p.m.

FRIDAY, DECEMBER 2.

*Architectural Association Discussion Section.*—Mr. A. E. Henderson on "Santa Sophia and Excursions into Asia Minor."  
*Glasgow and West of Scotland Technical College (Architectural Craftsman's Society).*—(1) Mr. D. Bennett Dobson on "Calculations Simplified." (2) Mr. W. H. Baxter on "Shoring and Slipping." 8 p.m.

SATURDAY, DECEMBER 3.

*Carpenters' Hall, London.*—Building and Sanitary Construction Examination (oral). 12 noon.

#### RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until January 2.

11,897. 24,312.—HAND SAWS, &c.: *J. Forsythe & W. O. Stanley.*—A base has openings or slots in each end for clamping-screws; at right angles to the base is the front in which are drilled holes tapped or screwed for clamping-screws, to be affixed on a saw that can be raised or lowered at will; on the bottom of the base is affixed a fence or moveable gauge regulated through the slots so as to allow of its being unfastened or fastened for setting the gauge at will; attached to the front is a saw in which suitable slots are cut to range with the holes in the front to admit of its easy removal or displacement for another saw of a different thickness, or raised or lowered; several parallel saws may be similarly fixed.

26,778.—ROOFING TILES: *F. Latham.*—To render the tiles weather-proof without sheeting, bedding, or pointing, they are made with a weather bar or water bar or flange on the underside of their top ends, and a weather bar or flange on the underside of their bottom ends; the tile is also cut away at the outside of its bottom end, one side edge is

rounded or beaded to form a groove, whilst the other edge has a rounded hooked part or scroll to fit over the beaded edge of the next tile; the bead is cut away at an angle at top and bottom to allow for overlapping, the scroll being similarly cut away at the top; projections or feet on the underside of each tile's top engage with the latch.

27,351.—OBTAINING MOTIVE POWER FROM THE RISE AND FALL OF THE TIDES: *A. Steiger, C.E.*—The claim is for the combination of a dam built across the bed of a tidal river or the mouth of a tidal basin, containing a turbine chamber and for a tunnel or tube extending across the dam, adapted to admit water into the turbine chamber through the turbine, with a system of gates or valves for controlling the flow of the water.

27,377.—CEMENT AND OTHER TILES: *A. Roberts, E. T. Ball, & W. H. Baughman.*—In order to form undercut recesses in the undersides of tiles the bottom die has spaces or openings wherein are placed moveable slides actuated by vertical taper wedges connected to a loose plate underneath the die, thus moving the slides outwards from one another across the die's face, the slides being kept in position against the wedges by springs or discs and an ink or colour reservoir, whose colour, close to the die, may be controlled by a valve or spring; the colour may also be transferred to the wheel by capillary attraction.

28,140.—SECURING SCAFFOLDING POLES TOGETHER: *W. & A. Hunsballe.*—The invention consists of variously shaped metal clamps, whereof some receive and hold the ends of horizontal runners whilst others grip and hold any part of a vertical pole; the clamp combines (a) a metal body having spikes and arms, with lugs for screws, and hooks, carried on the extensions, for holding a chain or band having a solid portion fitted with spikes; or (b) two members, connected by a pivot, whereof one has a hook and the other a lug for receiving a threaded hook connected with the lug and also with one end of a flexible band or chain.

28,482.—RULING OR MARKING DEVICE: *F. Merry.*—The instrument, which is adapted for the use of draughtsmen and others, comprises a grooved revolvable pulley or disc and an ink or colour reservoir, whose colour, close to the disc, may be controlled by a valve or spring; the colour may also be transferred to the wheel by capillary attraction.

28,523.—BALL AND FLOAT VALVES: *J. Smith.*—In the bore of the pipe above the ball-valve's seat is screwed a small barrel stop-cock, horizontally to turn in a sleeve of rubber or cork, or a small screw-down stop-cock may be vertically screwed into the pipe's bore, to allow the ball-valve and valve to be lifted off their bearings; the ball-valve is in two parts, joined a few inches from the ball, adjusted either horizontally or vertically; the ball-valve regulator is in two parts and jointed, on its longer arm, a fitted a small, half-rounded plate with a slotted curve in it; on the shorter arm, with the ball attached, is fixed a curved arm with a fixed screw to work in the end of the plate, the pin which takes the ball-valve's bearing is a fixture; by placing the valve on the end of the lever and lowering the ball end, the lever can be adjusted to the pin.

30,975.—CONTRIVANCE SPECIALLY APPLICABLE TO GAS STOVES, HOT AIR STOVES, &c., FOR HEATING DISHES, PLATES, &c.: *J. M. Clarkson.*—Racks and grids are arranged in a frame which has a heating chamber connected to the oven by means of the open pipe or chimney; the latter being diverted from its customary direction, so that the waste gases or fumes within the open pipe or chimney may be utilised for the purpose in view.

30,387.—APPARATUS FOR MIXING CONCRETE, &c.: *G. C. Kenyon, C.E.*—A rotating hopper has closed ends and a lengthwise opening, in which the gravel and cement are thoroughly mixed by arms that rotate relatively to the hopper; rotating conveyors are operated through change wheels by the shaft which carries the arms.

30,472.—MANUFACTURE OF SANITARY PIPE TRAPS WITH CURVED ARMS: *T. S. Green and S. W. Craig.*—The novelty lies in employing a mould, in two halves, adapted to slide to and fro, combined with a body-core and an arm-core or keyed segments fitting into key ways upon an arm-ring and a plain inner ring; the latter ring may be removed by a forked lever or rod, the half moulds carrying springs to prevent egress of clay and to yield to the pressure upon the sides of the die.

30,890.—FLEXIBLE AND ADJUSTABLE RULER FOR USE IN DRAWING CURVES: *G. P. Clark.*—A strip of flexible and resilient material has at each end a loop or hook. The user, by placing his fingers in the loops, can move the end of the strip or draw them together so as to curve the strip or modify the shape of its curve; for further modifying the curve, it is fitted in guides, attached either to the strip or to the hooks or loops, a sliding rod, whose end forms a rigid abutment, adjustable lengthwise with the ruler, for the ruler to be curved upon it as on a fulcrum.

11,891. 1,377.—SLEEVES FOR PIPE JOINTS: *J. Jones.*—The sleeve is made of a rubber body, which has an outer layer of canvas or other flexible and elastic material, having a stretching limit, beads are formed at either end of the rubber body, and the canvas is preferably carried over them.

20,793.—DRAWING COMPASSES: *G. Beach.*—To obviate the use of a screw in fastening the bladehead within the bore of a pair of compasses, the inventor (a schoolmaster) employs a split wedge, which slides up and down into the bore, and grips the lead by pressure between itself and the sides of the bore; the wedge is split into two tongues, thus giving a spring that helps to secure the lead.

11,526.—FIREPROOF WINDOWS: *F. Voigtmann.*—This consists, broadly, of a window having a sheet-metal casing with clenched joints at its corners; and elsewhere, where it need not be soldered, and a fireproof glass, e.g., "wire-glass," set into the sash with metallic fastenings, one of the sashes being hinged and held open by a retaining device to be severed by the heat of a fire.

11,500.—APPARATUS FOR TESTING DRAINS, &c.: *W. H. Hammond.*—A spring is placed inside or outside the tube containing the chemicals in order to secure the displacement. The tube may be charged with either powder or liquid, and is either broken by hand or exploded by pressure from an air-pump attached to it. By a modification the glass tube and its cover may be dispensed with, capsules of gelatine, &c., being substituted.

14,535.—SLIDE RULES: *L. Riccio.*—For the ordinary divisions on the slide's reverse side are substituted values of log-sin, log-tan, and equal parts, the upper scale being marked with divisions for log-sin, A, cos. A along its central line, and along its lower edge with the divisions for log-sin, A's value varying within certain limits for centesimal or sexagesimal graduations. It is claimed that the rule is especially adapted for calculations required in surveys made in tachymetrical methods. We have not space enough for describing its operation, since that rule will be done only by a chain of intricate details, depending upon the application of various formulae.



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. supplied by.	Tenders to be delivered.
Four Houses, Thornton Hall, M.R.C.	W. D. Jackson	A. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Three Houses, Mitholme, near Haverthwaite	Rhonda U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Two Blocks Sheds and Houses, Ca. industrial, Leaghey	Lewisam B. of W.	W. D. Morgan, Archt. 33, St. Mary's, Cardiff	Nov. 26
Additions to Schools	North Berwick Sch. Bd.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
*Kiln, Tar Paving, &c.	Lewisam B. of W.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
*Brick and Concrete Sewer, &c.	Lewisam B. of W.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Extension to Town Hall	Blackpool Corp.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Ten Houses, Tunstall-rd. Leeds	Rotherham Union	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Additions to Workhouse	Barstaple Union	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Club, Coldstream, N.B.	Croydon Corp.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Hoove, Warrington, Sarrey	Duckington Union	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Additions to 92 Houses, Felling, Durham	Midland Railway Co.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Engine House, Midland Mills, Bradford	Midland Railway Co.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
*Standing, Derby, &c.	Midland Railway Co.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Four Villas, Rothwell-rd. Halifax	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Other	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Four Shops with Dwellings	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Brigs, Boas of Garter, N.B.	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Additions to Infirmary, Blackburn	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Thirteen Houses, Bradford-street, Keighley	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Valias, Skircoat, Halifax	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Twenty-two Houses, Greenfield, Halifax	Romford U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Electric Power Station, Dublin	G. N. Ry. Co. (Ireland)	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
*Ferra Cotta or Artificial Stone	Hull Corp.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26
Fire Brigade Station, Chapel-rd.	Rugby U.D.C.	J. H. Gorton, Archt. 21, The Crescent, Morecambe	Nov. 26

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. supplied by.	Tenders to be delivered.
School, Rosebery-street	Loughborough S.B.	Rugby	Nov. 26
*Supply of New, and Purchase of Old	G. N. Ry. Co.	Mr. Weeks, Stores Superintendent, Doncaster	Nov. 26
*Yorkshire Stone	Greenwich B. of W.	Mr. E. J. Dawson, Building	Nov. 26
*Chapel, Fencing, and Roads, &c.	Ranching	Mr. E. J. Dawson, Building	Nov. 26
Electricity Buildings, Beckett-rd.	Barley Corp.	Mr. E. J. Dawson, Building	Nov. 26
Houses and Pavilion, Pater n.	Coventry Corp.	Mr. E. J. Dawson, Building	Nov. 26
Electric Light Stations	Coventry Corp.	Mr. E. J. Dawson, Building	Nov. 26
*Court, Police Cells, and Mortuary	City. Boro. of Croydon	Mr. E. J. Dawson, Building	Nov. 26
*Brick Sewers, &c.	Manchester Corp.	Mr. E. J. Dawson, Building	Nov. 26
*Refectory Pavilion, Fryer's Park	Fullam Vestry	Mr. E. J. Dawson, Building	Nov. 26
*Brick Fence Wall	Fullam Vestry	Mr. E. J. Dawson, Building	Nov. 26
*Two Chapel-at Workhouse, St. Pancras	St. Pancras Guardians	Mr. E. J. Dawson, Building	Nov. 26
*Buildings at Kent College, near Canterbury	Kent Wesleyan Meth. Sch. Soc.	Mr. E. J. Dawson, Building	Nov. 26
Cottage, Andersonstown, Belfast	R. Britton	Mr. E. J. Dawson, Building	Nov. 26
Parish House, Barrowby, Grantham	Barrowby Vestry	Mr. E. J. Dawson, Building	Nov. 26
Re-building Fish and Dolphin Inn, Carle	Jennett Bros.	Mr. E. J. Dawson, Building	Nov. 26
Hotel and Shop, Bridge-st. Wrexham	Bate & Son	Mr. E. J. Dawson, Building	Nov. 26
Three Houses, Thurston, Yorks.	L. Chorley	Mr. E. J. Dawson, Building	Nov. 26
Notes, Bedford	L. Chorley	Mr. E. J. Dawson, Building	Nov. 26
Warehouses, &c. Sunbridge-rd., Bedford	L. Chorley	Mr. E. J. Dawson, Building	Nov. 26
*Alterations to Drainage, &c. School, Waverley, Walsby	St. Pancras Guardians	Mr. E. J. Dawson, Building	Nov. 26
*Dining Hall, Chapel, &c. Girten College, Cambridge	St. Pancras Guardians	Mr. E. J. Dawson, Building	Nov. 26

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in.
*Borough Surveyor	Folkestone Corp.	£300, per annum	Nov. 26
*Sanitary Inspector	Fulham Vestry	£120, per ann. with uniform	Dec. 3

Those marked with an asterisk (\*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vii. viii. & xix. Public Appointments, pp. xvii. & xix.

15,311. KILNS FOR BLANK, LAR HUSARE, FIELD-CLAY GOODS, &c.: R. C. Staley.—The kiln has one mouth, or more, at each end. From each mouth or burner run a number of diagonal flues underneath the kiln to its opposite sides and ends. The articles to be burnt are protected by an inner wall, between which and the outer walls the heat ascends from the diagonal flues.

15,407.—FIRE-PROOFING COMPOSITION: G. H. Dine.—The composition is made of chloride of ammonia, 15 parts, and microcosmic salt, 1 part, used generally as a solution; it may be advantageously added, with celluloid, it is used dry or powdered, in the ratio of about one-fourth in weight of the substance of which the celluloid is made.

15,410.—BRICKS OR BLOCKS FOR BUILDING: H. T. Crangier.—Each block has a deep lengthwise groove in its two opposite sides or ends, one grooved side and one adjacent end have keyways or grooves, the other side and adjacent end have ridges or keys, or all the grooved sides and ends of some of the bricks may have keyways, and all the grooved sides and ends of others may have ridges or keys; the ridges and keys fit into the keyways, and the grooves form continuous air passages within the walls of the structure when built.

15,302.—ARTIFICIAL ASPHALT AND ITS MANUFACTURE: J. W. Hayward.—Ground limestone or a similar mineral or equivalent material, say 20 to 60 per cent., is added to petroleum residue, preferably before the oxidizing process; the retort containing the mixture is heated to the required temperature, and whilst the mixture is in a heated condition air is admitted under pressure, and diffused through the material to rapidly oxidize it, and make it consistent in substance; the retort is rotated on a stationary bolt shaft through which the air is forced, the shaft having hollow branches or arms to serve as agitators and scrapers through which the air passes into the material.

15,624.—WIRE FENCE MACHINES: A. H. Cook, J. G. Bruce, & Christine Bruce.—To dispense with supplemental brackets or clips the inventors have contrived (a) two vertical bars, fitted with brackets secured at the inner end between the wire clips, the other end being held in loops on the outer ends of the brackets; and (b) twisting devices for the vertical wires.

15,622.—ROOFING: A. Allen.—For joining the vulcanite, wood, cement, and other roof fittings to the roof, &c., without lead or zinc, and increasing the strength of the roofing, a sheet of wire or other woven fabric is inserted between the layers of felt, asphalt, or paper sheet and vulcanite, wood, cement, or other composition in construction the sheet and fabric can be turned up the face of the wall, or be built in; gravel kerbs are dispensed with by adopting an iron kerb at whose bottom edge is a flange to prevent the roofing composition from running into the gutter; if the gutter is on the outside of a wall the water outlets are protected by a kerb made of earthenware.

15,016.—MILLS FOR GRINDING MORTAR: E. Chalmers.—The essential features of the invention consist of the combination, with a circular toothed rack on the pan, of gearing by which the pan can be driven by manual or by other power, and of making the mill portable for convenient use when small buildings are being erected, seated or other motive power not being available.

15,930.—PIPE-JOINT OR COUPLING: J. S. & J. S.

Clinch.—For soft metal tubes, the device (also applicable to pipes of other metals, and to hose) has internal coned or tapered rings, over which fit the expanded or tapered ends of the pipes, annular internally threaded rings outside the aforesaid rings, and annular wedges or glands to screw into the external rings, the internal inclined part of the wedges pressing upon the outside of the tapered pipe-ends.

## NEW APPLICATIONS.

November 7, 12.

23,246, E. S. Bond, Carriage and Storage of Carbide of Calcium. 23,140, Underwood & Bateman, Parallel Vice. 23,352, F. D. Mellor, and 23,707, H. Swanton, Oil Cans, &c. 23,354, S. Mendel, Burglar and Fire Alarm. 23,361, H. Kinney, Mechanical Device for Screws, Partitions, & Coupling, Generation of Acetylene Gas. 23,364, C. H. Collins, Panels for Decorative and Protective Purposes. 23,376, J. Buzzard, Labour-saving Drum Hoist. 23,382, F. Beaupre, Mechanical Device for Screws, Partitions, &c. 23,388, J. B. Reiner, 23,397, Lewis and Others, and 23,533, C. E. Hartman, Electrical Arc Lamps. 23,539, S. Sapp and Others, Water Meters. 23,594, Smith & Forch, Saw Handles. 23,401, J. Ball, Coupling Link for Chains, Warps, Ropes, &c. 23,407, Prof. C. R. Ewing, Grinding, and other Mills. 23,433, C. Vermer, Electrical Arc Lamp Cut-outs. 23,437, and 23,992, G. E. Bourgois, Soldering Aluminium and its Alloys. 23,438, R. Allan, Window Lock. 23,446, T. F. A. Ash, Refuse Gatherer. 23,454, Days, Time Recorder. 23,466, J. D. Johnson, and 23,571, R. Jones, Circular Saw Guards. 23,485, J. W. Gilie, "Artificial Horizon." 23,489, G. C. Brown, Junior, Hinged Sliding Window Sashes to open inwardly. 23,508, T. Potter, Construction of Fireproof Buildings. 23,511, Berger & Gardier, Wood-turning Chisel. 23,514, Cliff & Jones, Combined Water Supply Connections and Hose Reels. 23,513, J. F. Ward, Rope Traction Conveying and Hoisting Apparatus. 23,525, Seagrave & Livingston, Heating and Drying Apparatus. 23,536, and 23,537, Devices for Automatically Closing Doors, &c. 23,539, J. C. M. Green, Electrical Energy Generation and Distribution. 23,541, P. C. L. Stuhlman, Grooved Tubes. 23,547, S. Simpson, Governors for Gas and other Fluids, and Turret Lathes, &c. 23,550, E. V. Camis, Artistic Decoration for Walls and other Surfaces. 23,551, R. Pearson, Electric Current Transformer. 23,556, A. E. Rogers, and 23,561, Windows for Preventing the Spread of Fire." 23,568, Owens & Hamman, Cut Bar or Tool-holding Device for Lathes, &c. 23,561, W. T. Rounsaville, Portable Lift or Loading Platform. 23,565, A. E. Rogers, and 23,568, Diagram Holder. 23,566, S. B. McGregor, Fire and Frost Thermometer. 23,573, R. Ewing, Earthenware Pipe Joints. 23,593, H. Chapman, Continuous to Alter-able Electric Current Transformer. 23,598, and 23,601, McCay, Window Fastener. 23,605, T. Rogers, Swinging Lamps for Tip Carts, Wagons, &c. 23,612, Bonneville & Watson, Holders for Paint Brushes, &c. 23,615, Farby, Lifts or Elevators. 23,621, E. Sinclair, Carrying Drawings, &c. 23,633, M. Cassart, Heating Apparatus. 23,634, J. B. Atkinson, Manufacture of Bricks, Tiles, Pipes, &c., from oil shale. 23,631, J. McGinnis, Smoker and Ventilator. 23,667, Priest and Millward, Hoisting Apparatus. 23,668, Brown & Naylor, Grates for the

inside Fireplace or Range of Register Stoves and Kitchen Ranges. 23,680, W. Rowthorn, Patternmaker's Wood Screw and Skewer. 23,685, A. Lewis, Flushing Cisterns. 23,686, G. Nobes, Gas Pipes, in case of fire. 23,702, J. W. Pattison, Treatment of Amalgams. 23,709, H. Davison, White Lead, &c. 23,705, L. Klein, Flushing Apparatus. 23,724, Mounford and Others, Coloured Decoration of Pottery. 23,725, W. Tappin, Seals for Outdoor Use. 23,753, J. A. Fleming, Electrical Measuring Instruments. 23,754, Louis M. Cooper, Handle or Stock Fastening. 23,757, Lord and Buttersworth, Dust, Draught, and Weather Excluders. 23,768, P. S. Brown, Multiple Ply Veneer and Roofing Plates, &c., made thereof. 23,777, T. H. Ash, Tanks or Vessels of Various Metals and Alloys. 23,779, A. L. Haverkamp, Handles and Holders for Tools. 23,784, W. A. Roper, Registering Devices for Lifting and Hoisting Apparatus. 23,792, W. H. Hoyle, Flushing Valves. 23,812, N. Cloutier-Colson, Pipe Jointing. 23,815, H. Morris, Colouring Glass and Metal Surfaces for Decorative Purposes in Buildings, &c. 23,814, J. Martin, Window Handles. 23,824, I. Hultman and Others, Calculating Machine. 23,835, A. B. Wilson, Water Purifier. 23,841, J. B. Reid, Brake Apparatus for Electrically-driven Cranes, &c. 23,843, J. Scott and Others, Antiseptic Compound to be Laid on Floors. 23,851, Elizabeth A. Davies, Adjustable Spout. 23,856, G. Morgan, Glazed Tiles and Bricks. 23,860, R. Mason, Reversible Windows, and ventilation thereby. 23,862, R. D. Shannon, Wood-Moulding Cutter. 23,864, J. Cope, Metal and other Castings. 23,869, E. W. S. Deane, Cabinets, Chests of Drawers, &c. 23,900, H. Valdes, Weighing Machine Scales, &c. 23,905, C. Koenig, 23,906, Combined Screw-Wrench and Adjustable Turn-Screw. 23,907, G. F. Sturges, Right and Left Transfer Needle. 23,908, Gloves, Padlocks, Locks, and similar Fasteners.

## SOME RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

November 4.—By RUSHWORTH & STEVENS.  
Horseley, Hants.—19, Ormsford-rd., a freehold building site, 100 ft. by 100 ft., with a small garden, &c. By G. RAVENSHIRE. £215  
Greenwich—29 and 31, Crooms Hill, f. r. 801. By WATKINS & RAWES (at Bishopsgate). 1,000  
Bishopsgate, Hants.—Main-rd., two plots of building land, f. r. 250. 250  
Bow Mead, 5 a. 0. 2. 3 p. f. r. 250. 250  
Fairbank, Hants.—Two enclosures, 1 a. 2. 28 p. f. r. 250. 250  
Owsleybury, Hants. Crowd Hill Farm, 56 a. 2. 16 p. f. r. 250. 250  
By G. A. WILKINSON & SONS.  
Greenwich.—61 to 71 (odd) Chester-rd., ut. 20 yrs. g. r. 154. 500  
8, John-st., ut. 36 yrs. g. r. 241. 245  
By DIVER, SON, & HAYES (at Bishopsgate).  
Balham.—35 and 37, Ramsden-rd., f. r. 721. 750  
Nunhead.—62, Evelina-rd., ut. 75 yrs. g. r. 410. 410  
By G. A. WILKINSON & SONS.  
Walworth.—366 and 368, Walworth-rd., ut. 63 yrs. g. r. 201, r. 1261. 1,800



By WOODS &amp; SMELLING.

New Cross.—Cottages, a plot of building land, f. r. 120.  
Silverton.—77 to 23 (odd), Eastwood-rd., ut. 80  
127, f. r. 127.  
130, f. r. 130.  
Fulham.—35, and 5, Everington-st., ut. 80 yrs.  
g. r. 101, 108.  
Chiswick.—g. r. 121, 128, f. r. 124.  
83 yrs, g. r. 45, and 47, Bolton-gardens, ut. 83 yrs, g. r. 121, 128, f. r. 124.

By LEOPOLD FARMER.

Brondesbury.—31, 33, and 97, Brondesbury-villas, ut. 68 yrs, g. r. 314, 108, f. r. 124, 108.  
Brondesbury-villas, a plot of building land, ut. 81 yrs, g. r. nil.  
81, 127, and 129, Brondesbury-rd., also Clarence House, ut. 81 yrs, g. r. 391, f. r. 200.  
2, Halse-st., ut. 81 yrs, g. r. 391, f. r. 200.  
10, and 11, Halse-st., ut. 67 yrs, g. r. 212, f. r. 232.  
By DANKHAM, STONE, & SONS (at Reading).  
Reading, Berks.—25, West-st., f. r. 634.  
Oxford-rd., Roxburgh House, f. r. 501.  
Eleigh-rd., West View House, f. r. 244.  
51, Market-rd., f. r. 501.  
By TOWLES & MARTIN.  
South Kensington.—70, Cromwell-rd., ut. 38 yrs, g. r. 24, f. r. 501.

Claremont.—"King's Head," f. r. 1,000.  
By Messrs. FOSTER.

Notting Hill.—94, Ledbury-rd., ut. 48 yrs, g. r. 64, f. r. 401.  
By Messrs. FOSTER & THOMAS.  
South Kensington.—24, Stanhope-gardens, ut. 23 yrs, g. r. 54, f. r. 210.  
31, Onslow-rd., ut. 34 yrs, g. r. 80, f. r. 200.  
Fulham.—113 to 146 (even), North End-rd., area 2,500 ft. c., and 4, Colmer-rd., ut. 67 yrs, g. r. 61.

By WESTON &amp; SONS.

Clapham.—97 and 99, Dorset-rd., and 12, Killeshaw-rd., ut. 10, Waterloo-pl., f. r. 1,050.  
By FLEURET, STONE, & ADAMS (at Brighton).  
Brighton.—St. James-st., "The St. James' Hotel," ut. 16 yrs, f. r. 140, with goodwill.  
West Ham.—Diction-rd., f. r. 124, reversion in 97 yrs.  
Notting Hill.—132, Portland-rd., ut. 53 yrs, g. r. 301.

By NEWBORN, EDWARDS, &amp; SHEPHERD.

Stoke Newington.—g. r. 34, f. r. 48, g. r. 321.  
Hoxton.—10, Shaftesbury-st., ut. 324 yrs, g. r. 108, f. r. 104.  
Teddington.—20 to 24, Somerset-rd., ut. 80 yrs, g. r. 301, f. r. 104.  
Hoxton.—5, Croyley-st., ut. 431 yrs, g. r. 74, f. r. 104.

By STIMSON &amp; SONS.

Canterbury.—g. r. 73, 108, f. r. 124, 108.  
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

By NEWBORN, EDWARDS, &amp; SHEPHERD.

Stoke Newington.—g. r. 34, f. r. 48, g. r. 321.  
Hoxton.—10, Shaftesbury-st., ut. 324 yrs, g. r. 108, f. r. 104.  
Teddington.—20 to 24, Somerset-rd., ut. 80 yrs, g. r. 301, f. r. 104.  
Hoxton.—5, Croyley-st., ut. 431 yrs, g. r. 74, f. r. 104.

By STIMSON &amp; SONS.

Canterbury.—g. r. 73, 108, f. r. 124, 108.  
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

By NEWBORN, EDWARDS, &amp; SHEPHERD.

Stoke Newington.—g. r. 34, f. r. 48, g. r. 321.  
Hoxton.—10, Shaftesbury-st., ut. 324 yrs, g. r. 108, f. r. 104.  
Teddington.—20 to 24, Somerset-rd., ut. 80 yrs, g. r. 301, f. r. 104.  
Hoxton.—5, Croyley-st., ut. 431 yrs, g. r. 74, f. r. 104.

By STIMSON &amp; SONS.

Canterbury.—g. r. 73, 108, f. r. 124, 108.  
2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80,



LONDON.—For cast-iron lamp columns for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor.  
Per Ton.  
E. Stevenson.....£14 0 0  
Moorgate Engineering Company.....10 0 0  
T. Howden & Sons.....9 0 0  
Stanton Iron Works.....9 0 0  
J. Shaw & Co.....9 0 0  
Rowland Carr & Co.....8 10 0  
F. Bird & Co.....8 10 0  
H. & G. Measures.....8 0 0  
\* Accepted.

LONDON.—For constructing new road through Queen's Wood, Highgate, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor.  
W. Langridge.....£3 9 8  
W. Clark.....1 0 0  
W. Griffiths.....1 0 0  
E. T. Bloomfield.....3 5 0  
W. T. Williamson & Sons.....1 5 0  
C. Ford.....3 5 0  
\* Accepted.

LONDON.—For cast-iron telephone pipes and pit covers, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor.  
Pipes per ton. Pits per ton.  
H. & G. Measures.....£12 0 0  
Stanton Iron Works.....8 0 0  
Hollom & Co.....6 3 0  
Bird & Co.....6 5 0  
\* Accepted.

LONDON.—For wrought-iron tree-guards, for the Hornsey District Council. Mr. E. J. Lovegrove, Engineer and Surveyor.  
Per Tree-guard.  
Caversham Studio.....£12 3 0  
Newton, Chambers & Co.....15 0 0  
Beck & Co.....14 0 0  
Jukes, Coulson, Stokes, & Co.....9 0 0  
Hayles, Jones, & Baylis.....8 0 0  
Hayward & Sons.....8 0 0  
\* Accepted.

LONDON.—For new laboratory, &c., at Millwall, for the Electrical Power Storage Company, Limited. Mr. Alfred Roberts, architect, 16, Nelson-street, Greenwich, S.E.  
Jones & Groves.....£1,500 0 0  
T. D. Lang.....1,600 0 0  
Jerrard & Sons.....1,575 0 0

LONDON.—For alterations, additions, and dilapidations at No. 9, Leytonstone-road, Stratford, E. for Mr. G. Putter. Mr. Fred. A. Ashton, architect, 17, Remford-road, Stratford, E.  
W. G. Macdonald.....£800 0 0  
J. & H. Cocks.....807 0 0  
C. North.....798 0 0

LANGLY.—For the erection of a school at Pontyberem, for the Llanelly School Board. Mr. J. B. Morgan, architect, New-road, Llanelly.  
E. Mainwaring.....£1,331 0 0  
G. Mercer.....1,249 10 0  
B. S. John.....1,248 10 0  
[Architect's estimate, £1,255.]

**C. B. N. SNEWIN**  
MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and TIMBER MERCHANT  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
HATTON GARDEN, and 29, BAY STREET,  
FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
TELEGRAPH, DAY, AND NIGHT FOR IMMEDIATE DELIVERY.  
Telephone, No. 76 Holborn. Tele. Address "SNEWIN" London.

NORWICH.—For the re-erection of "The Grapes" public-house, Wennum-street, Norwich, for Mr. R. J. Mallett. Messrs George Pitt & Co., Ltd., architects and surveyors, Queen-street, Norwich.  
J. Hunt.....£1,500 10 0  
J. Young & Son.....1,500 0 0  
Scaries Bros.....1,498 0 0  
\* Accepted.

PETERBOROUGH.—For the erection of club premises, shops, &c., Boroughbury, Peterborough, for the Liberal Club Building Committee. Mr. A. W. Rutledge, architect, Boroughbury, Peterborough.  
W. Howard.....£2,500 0 0  
J. W. Kove.....2,475 0 0  
Furnis Bros.....2,350 0 0  
W. Patterson & Sons.....2,141 0 0  
F. Colls.....2,078 0 0  
Sibley Bros.....2,030 0 0  
\* Accepted.

SWANSEA.—For the execution of drainage works, Gowerton, for the Rural District Council. Mr. J. Thomas, C.E., 39, Fishers-street, Swansea.  
John Harvey.....£445 0 0  
W. Lane.....400 0 0  
J. & F. Weaver.....415 0 0  
\* Accepted.

SYSTON (Leicester).—For the execution of sewerage works, for the Barrow-on-Sonar Rural District Council. Messrs. Simpson & Harvey, engineers, Alliance Chambers, Horsefai-street, Leicester.  
Thos. Philbrick, Leicester.....£26,240 0 0

WILLINGTON QUAY.—For the construction of sewers for the Urban District Council. Mr. J. F. Davison, surveyor, Potter-street, Willington Quay, Northumberland.  
Murphy & Macmillan, Willington Quay (on schedule of prices).

WRITTLE (Essex).—Accepted for erecting three cottages, Oxney Green. Mr. R. Mawhood, architect.  
Moss, Writtle.....£805 0 0

#### TO CORRESPONDENTS.

A. S.—A. H.—R. and W. (Amounts should have been stated). NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications beyond mere news items which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

**J. J. ETRIDGE, Jr.**  
SLATE MERCHANT,  
SLATER and TILER.

ESTIMATES GIVEN FOR

**SLATING AND TILING,**

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,  
Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to

**BETHNAL GREEN SLATE WORKS,**  
BETHNAL GREEN, LONDON, E.

#### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 9s. per annum (12 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 40s. per annum. Remittances payable to DOUGLAS FOURDRINIER should be addressed to the publisher of "THIS BUILDER," No. 46, Catherine-street, W.C.  
SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 25s. per annum (12 numbers) or 4s. 6d. per quarter (12 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

#### THE BATH STONE FIRMS, Ltd.

BATH.  
FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

#### HAM HILL STONE DOULTING STONE.

The Ham Hill and Douling Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Traill & Co.)

Chief Office:—Norton, Stoke-under-Ham,  
Somerset.

London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Foultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the North Bridge Co. [Advtr.]

#### SPRAGUE & CO., Ltd.

LITHOGRAPHERS AND PRINTERS.

Estate Plans and Particulars of Sale promptly executed.

4 & 5, East Harding-st., Fetter-lane, E.C. [Advtr.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

**METCHIM & SON**, 8, PRINCES STREET, ST. GEORGE'S ST. W. LONDON.  
QUANTITY SURVEYORS' DIARY AND TABLES.  
For 1899, price 6d. post 7d. In leather 1/1. Post 1/1 [Advtr.]

THE  
**French Asphalte**  
COMPANY.

Suffolk House, Cannon-street, E.C.

SUPPLY THE BEST MATERIAL AND  
WORKMANSHIP FOR BUILDINGS,  
DAMP COURSES, AREAS, ROOFS,  
WASHHOUSE AND DAIRY FLOORS,  
&c., &c.

This Asphalte was chosen to be  
laid at Sandringham, on the new  
General Post Office, and other  
important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

**IRON CISTERNS.**

**F. BRABY & CO.**

VERY PROMPT SUPPLY.

LARGE STOCK READY.

CYLINDERS FOR HOT-WATER CIRCULATION.

Particulars on application.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL:  
6 and 8, HATTON GARDEN.

GLASGOW:  
47 and 49, ST. ENOCH-SQUARE.

BRISTOL:  
ASHTON GATE WORKS, CORONATION-RD.



## ILLUSTRATIONS.

Decorative Bas-Reliefs.—By Miss E. M. Rope	Double-Page Ink-Photo.
Buildings at Bromley, Kent.—Mr. Ernest Newton, Architect	Double-Page Photo-Litho.
Interior of St. Mark's Church, Mansfield.—Mr. Temple Moore, Architect	Single-Page Ink-Photo.
Design for a Gateway Tower, leading to a College Quadrangle.—By Mr. G. J. J. Lacy	Single-Page Ink-Photo.
Church of St. Columb, Lancaster-road, W.—Mr. W. A. Pitt, F.R.I.B.A., Architect	Two Single-Page Ink-Photos.

## Blocks in Text.

Sketches of Saxon Balusters	Pages 498, 499	Sketch Illustrations.—By Mr. Paul Waterhouse	Pages 57, 584, 595
Design for a Gateway Tower.—Plan			Page 508

## CONTENTS.

Saxon Baluster Shafts	497	Design for a Gateway Tower	508	General Building News	516
Notes	500	Proposed Church of St. Columb, Lancaster-road, W.	508	Sanitary and Engineering News	517
The Royal Institution Competition	501	Competitions	508	Foreign	518
The Architectural Association	504	Applications under the 1894 London Building Act	509	Miscellaneous	519
The London County Council	506	Books Received	509	Capital and Labour	519
Architectural Societies	507	The Durham Gallies	509	Legal	519
Sculpture Panels	508	The Smoke Nuisance	509	Meetings	519
Premises, Bromley	508	The Student's Column.—Sound, Light, and Heat.—XXII.	509	Recent Patents	519
Interior of St. Mary's Church, Mansfield	508	Obituary	510	Some Recent Sales of Property	519

### Saxon Baluster Shafts.



THE mid-wall shafts dividing the belfry openings in the class of church towers referred to in the *Builder* of August 6, 1898, are as a rule quite plain; but there do

occur examples, as at St. Benet's, Cambridge, in which the introduction of bands give the shaft something of the appearance of a baluster. The true Saxon baluster shafts, however, do not as a rule occur in these belfry openings, but in structures which are to all appearance of an earlier type. The accompanying drawings show some characteristic examples of these curious features of our pre-Conquest buildings, with which are connected some rather puzzling questions of origin.

They are established as early features through their occurrence in the western porch at Monkwearmouth, the date of which is fixed by several converging lines of evidence to the close of the seventh century, while a comparison with Roman remains indicates the same early period for their appearance. In technique and in a certain general character they resemble similar features in Roman work, though on the other hand they are in a most important respect entirely unclassical. The Roman evidence comes mainly from the North, and appears in the form of representations of baluster shafts on a small scale on sculptured stones, such as altars. For example, on a Roman altar found not long ago at Birrens, Dumfriesshire, on the Scottish side of the great wall, we find the detail shown in fig. 1, where in the centre of the front a round-headed niche is flanked by two supports that evidently represent such balusters. A small Roman altar from Lan Chester in the Cathedral library at Durham exhibits a niche flanked in the same manner. These upright shafts, represented as used constructively, must be distinguished from similar motives, strung together in a sort of beading, and used to form continuous lines of enrichment, as on the Birrens altar, on each side of the niche in fig. 1. It is probably incorrect to speak of these as "rows of balusters."

They are really forms of the astragal ornament, though the elements of the pattern may at times have been influenced in form by baluster shafts. In a Roman stone built into the north wall of the north passage of Wilfrid's crypt, at Hexham, there is an astragal of a simple type (fig. 2), and the Birrens beading would be much the same, only that in the middle, at the thickest part, each bead is either cut in two or marked with a nick, it is not easy to say which. Now these same forms of supporting baluster and of beading occur in undoubtedly Saxon stones, many characteristic examples of which are in the Durham Library collection. Fig. 3 is one of several fragments found on the site of the nave of Wilfrid's church at Hexham, and there is every reason to believe that these formed part of its enrichment. Here distinct balusters occur as ornamental motives, while there are other stones in the same collection with Saxon carving on them, which show forms of the beading above noticed. On a well-known stone in the porch of Jarrow Church (fig. 4) there is a row of little balusters, about  $3\frac{1}{2}$  in. high, set upright, but curiously similar in shape, if we look at them in one way, to the elements of the horizontal beading on the Birrens altar.

The Roman carver would probably not have represented these baluster shafts as used constructively unless such features had been employed in real life, though nothing exactly like them may have been found on Roman sites. In Saxon work they are not only represented in ornament but actually occur used constructively in buildings. That they are of Roman derivation may be inferred from the comparisons just made between Roman and Saxon stones, and is rendered still more probable by the technical peculiarity that the early Saxon balusters, like the small Roman shafts with moulded caps and bases, are turned in the lathe. We come now, however, to the striking fact that the oldest Saxon shafts occurring at Monkwearmouth, and in the work of coeval date at Jarrow, are in profile quite unlike anything we find in Classical architecture. The existing Roman shafts of small size found in this country (save only some of a special class to be noticed presently) are Classical, inasmuch as they exhibit the three parts of the normal column—base, shaft, and capital. The base and capital may be worked into any number of moldings, and the neck may be simi-

larly treated, but the main divisions of the whole are not really obscured. The character of these Roman shafts is well illustrated by the example shown in fig. 5; one germane to the present subject, as it actually occurs in the belfry opening of a Saxon church tower at Wickham, Berks. The church lies close to the Roman road that strikes off from the Kennet valley at Speen (the ancient Spinæ) in the direction of Cirencester, and this may explain the appearance in the building of two unmistakably Roman shafts, of which one is given in the illustration. Here we have the normal elements—base, shaft, neck, and capital—of conventional late Classical form.

In the same way the decorative balusters already noticed, whether Roman or Saxon, have base, shaft, and capital. On the other hand, if we take actual Saxon balusters in real life, as illustrated in the accompanying drawings, this classical membering of the shaft is not common, and when it does occur it is in examples that may be placed comparatively late. The early shafts at Monkwearmouth and Jarrow are conspicuous for the complete absence from them of any sign of this Classical norm. They are decorated with a good deal of elaboration by means of numerous shallow projections and hollows that are distributed symmetrically above and below the centre, and take no account of head and shaft and base. The most important examples, those actually *in situ* in the jambs of the porch at Monkwearmouth, were illustrated in the *Builder* of October 12, 1895, on p. 251; but there exist there, or at Jarrow and Durham Cathedral Library, whole or in fragments, nearly fifty similar shafts of the same character, but varying in the distribution of the projections and hollows. The score or more of them in Jarrow porch seem to belong to two types, called here A and B. The examples of each vary slightly, and the two sketches in fig. 6 represent the two forms with sufficient correctness for the purpose. It will be noted that in type A the general outline is straight, while in type B parts of the baluster swell out beyond the general line. This difference occurs also in the Monkwearmouth examples, which are less easy to group and rather smaller in size. In no case, however, in this particular set of shafts do we

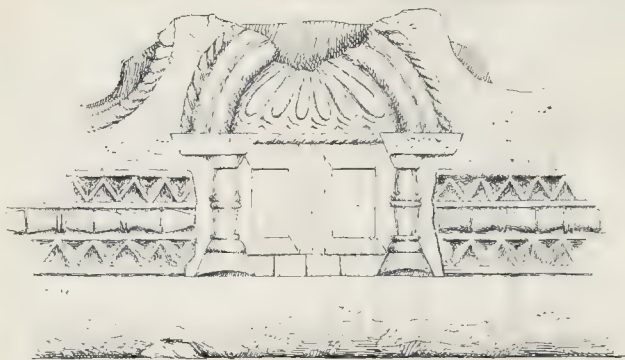


FIG. 1. Part of Top of Roman Altar from Bilton, Dunstable, Beds.

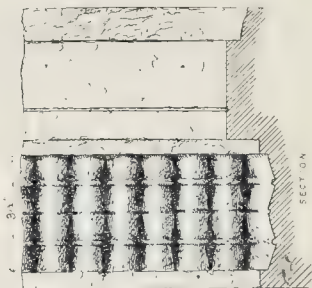


FIG. 4.—Part of String-course in the Porch of St. Paul's Church, Farnham-on-Tyne (one-quarter full size).



FIG. 2.—From a Roman Stone in the Crypt at Hexham.



FIG. 3.—Portion of Enriched String-course from Site of Nave of Wilfrid's Church at Hexham: Seventh Century (one-quarter full size).



FIG. 7.—Baluster Shafts from St. Mary-in-the-Castle, Dover; in Dover Museum.

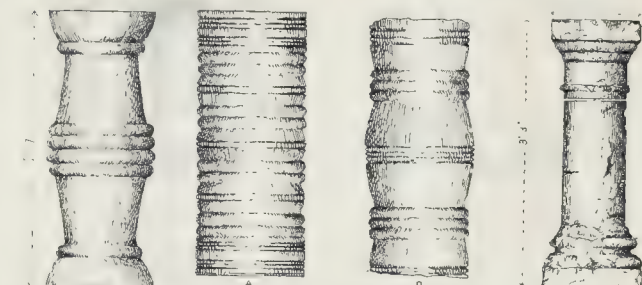


FIG. 8.—In South Side of Ringing Chamber, Barton-on-Humber.

FIG. 6.—Sketches of Typical Baluster Shafts in the Porch of Farnham Church.

FIG. 5.—Roman Shaft in Belfry, Wickham Church, Berks.

find the marked bellying out of the whole shaft towards the centre part, or the drawing in at the neck and base, of which the other illustrations to this paper give so many examples. It may be noted that though the Roman shaft at Wickham (fig. 5) is straight-sided, there are other Roman examples of the kind with a distinct bellying. One of these is shown in the illustrations to Mr. Fox's paper on "Uriconium," in the "Archæological Journal" for 1897. In all the Monkwearmouth-Jarrow examples the mouldings are very delicately worked in the lathe, and give a high idea of the skill and industry of the craftsman of the time. As regards the use of them, it has been suggested that they formed part of the choir enclosures in the churches where they have been found; but, on the other hand, there are some still in their original position at Monkwearmouth, inserted in the jambs of the window openings in the west wall of the nave (see *Builder* as above), where they came to light in 1866. If this was the way

they were used, the number found at the two churches would pretty well correspond to the probable number of the windows. Shafts of this particular kind seem not to have been found anywhere else in our own country, nor are examples known on the continent. We search in vain for their prototypes either in Italy or Northern Gaul, the two sources from which the builders of these churches by Wear and Tyne are supposed to have drawn their inspiration.

Passing away from this specially interesting northern group, we find a set wrought with equal care at the opposite extremity of the country, in the museum at Dover, whither they have been transferred from the Saxon Church of St. Mary-in-the-Castle (fig. 7). They are in a very fragmentary condition, and some pieces have been worked into Early English mouldings. They have been turned in a lathe, and the forms are well emphasised and the cutting sharp and clean. One example is remarkable because the shaft springs from

a square plinth cut out of the same piece of stone with itself. These shafts have more of the normal baluster form, with a distinct swelling in the middle part; and this shape is still more distinctly seen in the example from Barton-on-Humber (fig. 8), where the profile is not unlike that of the little decorative baluster shafts in the north. There is a well-known series of turned baluster shafts in the triforium openings of the transepts of St. Albans, figured in Buckler's work on the abbey, that are supposed to be part of the material collected for the rebuilding of the Abbey by Abbot Ealdred at the end of the tenth century. This may be the truth, though it is worthy of note that they are of precisely the same stone, a fine grained oolite, as the Early Norman capitals and plinths and the plain round or octagonal shafts that occur in the same range of openings. The whole of the stone may, of course, have been taken from the ruins of Verulamium, but in this case one would expect to see some trace of a Roman tool on some



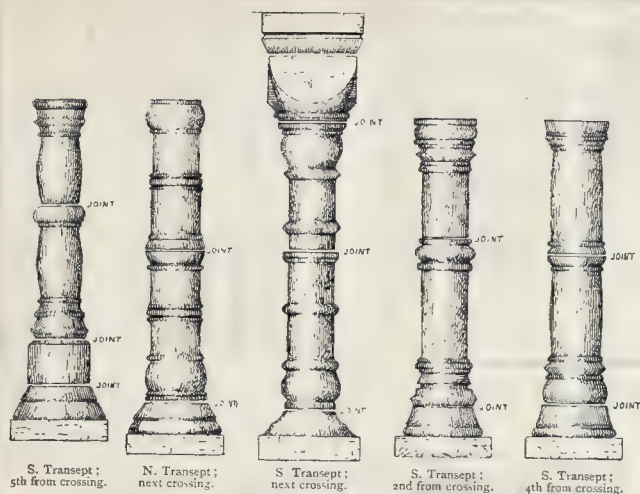


Fig. 9.—Baluster Shafts from Triforium of Transepts, St. Albans ( $\frac{1}{32}$  full size).

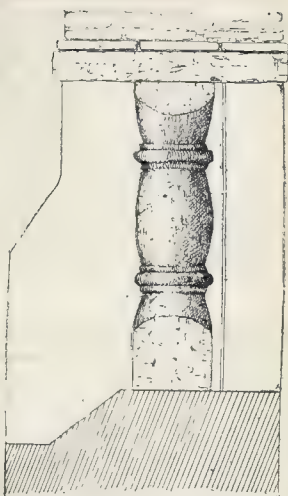


Fig. 10.—Section of Three-light Opening, West Wall, Brixworth Church; showing baluster.



Fig. 11.—Baluster in Belfry, Earl's Barton.

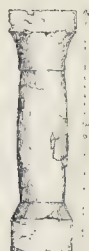


Fig. 12.—From Bardsey Church Tower, Yorkshir.



Fig. 13.—Worth Church, Sussex; Window in North Wall of Nave.

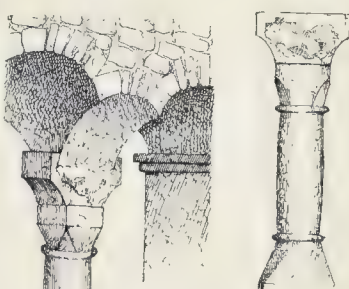


Fig. 15.—Baluster in Two-light Window in East Wall, Wing Church, Bucks.

of the stones, showing that they had been reused. It is not, however, the present purpose to discuss questions of this kind. It is enough to note here that the shafts, which are eight in number, are in no instance all in one piece, but are made up of short lengths averaging about 30 in., which are joined as shown in the examples chosen for illustration (fig. 9). Some of the mouldings, especially at the bases, are made up with plaster, and the whole work presents a somewhat makeshift aspect, quite consistent with the theory that the pieces were survivals from an old store of building material. The caps on them are Norman, of a style like the one specimen shown.

Another class of shafts is represented by the Northamptonshire examples illustrated in figs. 10 and 11. The first is one of the two shafts dividing the triple opening from the upper story of the tower to the nave at the west end of Brixworth Church, and the latter one of many shafts, all of the same character, used in the tower of Earl's Barton. These examples differ from those previously noticed in that they are not turned in the lathe, but are roughly hewn to shape by mallet and chisel. They may be regarded as clumsy imitations of the turned balusters, the use of which begins, at any rate, at a

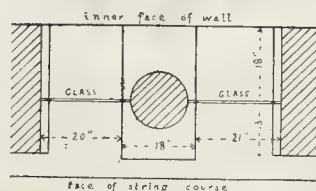


Fig. 14.—Plan of Window, Worth Church.

much earlier period than that to which these Northamptonshire examples can be ascribed. The Brixworth shafts possess a cap and base of the normal cubical form, cut in the same piece with the shaft.

With the above may be compared the similar but smaller mid-wall shaft (fig. 15) that divides the opening high up in the east wall of the church of Wing, Bucks. This is a building which, on the evidence of its plan, has been attributed to the same age as the main structure at Brixworth. The opening at Brixworth containing the shafts (fig. 10) is shown by distinct marks to be a later insertion in the wall where it is found. Here, at Wing, there are no such indications, and if the window with its shaft is contemporary

with the rest of the fabric it becomes a document of capital importance as bearing upon its date.

The last examples selected are shafts of a simple bellying form without mouldings. Fig. 12 has a rude cap and base, and occurs in the very interesting tower of Bardsey Church, near Leeds. The tower, like that at Monkwearmouth, is built on the top of an original western porch of early date, measuring, internally, 10 ft. 2 in. east to west, by 8 ft. north to south, the walls of which are barely 2 ft. thick, though the superimposed tower is nearly 50 ft. high. In this tall and slender tower (it only measures 12 ft. 1 in. in width on its western face) there are on the south side two stories of double openings with midwall shafts and through stones, from one of which the illustration is taken. Finally, figs. 13 and 14 are from the church of Worth, Sussex, where we find mid-wall shafts of rude workmanship dividing the double window openings on both sides of the nave. The church is of late Saxon date, but the shape of the baluster, a plain bellying shaft without mouldings, is curiously like one particular form of Roman shaft referred to above, of which a few examples have been found. The Roman stones in question are unmoulded, and are not unlike the supports of floors in

chambers with hypocaust arrangements. One at Chesters, on the North Tyne, measures 2 ft. 2 in. in height, and swells from a diameter at each end of about 5 in. to a middle thickness of nearly 9 in. In the case of Worth there can be no question of a borrowing of Roman detail, as the church is in the middle of the Andredsweald and away from Roman sites. The resemblance is merely a coincidence, and does not help us in working out the problem of the relation to Classical models of these interesting features of our pre-Conquest churches.

## NOTES.

**VARIOUS** incidents at recent meetings of the London County Council and Workmen's Dwellings Council seem to point to the probability of this body adopting a policy in regard to workmen's dwellings which would be most undesirable, viz., to build them even though they will be let at a loss. Last week the standing order which prohibits the Council from letting workmen's dwellings at rentals which do not return a fair interest on the outlay was suspended. The truth is that there should be an inquiry into the working of the statutes which regulate this matter, and into the way in which has been carried out by different municipalities. If the London County Council erects buildings for the working men who are turned out of existing buildings for necessary improvements, of too expensive and luxurious a character, of course they cannot charge low rents. On the other hand, it may be argued that the necessary cost of building is such that rents which ordinary working people can pay cannot be asked, and that, as the Council is bound to provide workmen's dwellings, it has no option but to let them at a loss. But London is not the only place where workmen's dwellings have to be built when improvements are made in a town, and it is just the kind of subject on which an impartial inquiry would throw valuable light.

**THIS** Act is rapidly receiving many glosses. It is surprising, indeed, how numerous will soon be the decisions upon it. The last one of importance has given an interpretation to the words "on, in, or about a factory," which occur in Section 7. The case arose thus: The defendants were builders and contractors; the plaintiff was a carter in their employment, and at the time he met his death was loading a cart with lumber outside the factory. A part of the load struck and killed him. The County Court Judge decided that the builders were liable, and this decision has been confirmed by the Court of Appeal. It is clear that although the man was not actually working in the factory, he was engaged on business closely connected with it. It was a claim clearly, as the phrase is, within the principles of the Act. The injured person was engaged on business so closely connected with the factory as to make it part and parcel of the factory work. It is obvious, however, that very nice distinctions will constantly arise, because every such case as this must be decided on its special facts. On the whole, we would recommend employers not to contest cases which, as we have said, are obviously intended to be covered by the statute.

**PARTS** of the City of Florence have been some time ago rebuilt and modernised, but not without reason in a sanitary sense, and hitherto the structures most dear to architects and artists have been spared. There is now, however, an active disposition on the part of the Local Authorities to carry things further, and among other things the Ponte Vecchio is threatened. The removal and rebuilding of this ancient structure would go far to alter the whole ancient character of the city. How far there can be any plea that it is practically necessary it would be impossible to say without a careful inspection of the work on the spot, but every effort ought to be made to save it. A local committee has been formed among those who care for the monuments of ancient Florence, to petition against the threatened proceedings of the City authorities, and signatures to it are being largely obtained in England. A copy of it is at the office of the Institute of Architects, where it can be signed by those wishing to add their names to the protest. We now hear that the picturesque old wooden bridge at Lucerne is also threatened, as is stated, merely on the ground that it is old and (apparently), in the minds of the local people, unsightly; though there may be other and more practical reasons which have not been publicly stated. But the authorities who are so anxious to "improve" ancient cities by destroying their picturesque and historical character would do well to remember that this cuts both ways, and that in thus modernising the cities they are destroying the principal interest which brings foreign visitors and foreign money to them.

**A NEW** process is announced for seasoning wood by electrical action. The timber to be treated is put into a quadrangular tank of liquid, immersed to rather more than half its depth, and an electric current applied through a metallic conductor, so arranged as to distribute it throughout the area, and it is stated that in a space of four minutes the sap begins to exude at the lower end of the wood; in six hours it is all extracted. The wood is then placed in another tank from which a septic solution is forced into the pores by an electro-capillary method. If this process has successful results at a cost which will not be commercially prohibitory, it may prove of great importance; but we decline expressing any decided opinion on it until after the practical demonstration of it which is promised; we merely here call attention to the subject.

**THE** paper which was read recently by Professor George Forbes, F.R.S., at the Society of Arts, on "Long-Distance Transmission of Electric Power," is interesting, coming as it does from a thoroughly practical engineer. The part of it which has been subjected to severe criticism is rather of financial than of scientific interest. The author pointed out that although in every long-distance transmission scheme the cost of the copper used in the mains must always represent a very large fraction of the total initial cost, still, as the metal did not deteriorate to any appreciable extent, the money required for it could always be borrowed at a low rate of interest,

the metal itself representing an asset which was practically only affected by fluctuations in the market price of copper. Still, most people would hesitate before they took a four per cent. mortgage on some hundreds of tons of copper exposed in some inaccessible part of Africa or New Zealand. Also, in a 500 mile transmission scheme—for example, from the Victoria Falls on the Zambesi to the gold mines of Rhodesia, the cost of the cartage of this copper, in the unfortunate event of the scheme not being a success, would be a heavy item. Special precautions would also have to be taken against thieves in order to safeguard the bondholders' asset. With the exception of this assumption, the lecturer's remarks were sound, and the methods he elaborated rapidly estimating the cost in any particular case are well worthy of the attention of engineers. He estimated that the electric lighting of Cairo could be done more cheaply by transmitting power from the First Cataract of the Nile—a distance of 400 miles—as the crow flies—than by steam-engines in Cairo itself.

**SOME** of the daily papers have discovered a lake in the sandstone at Reigate. From the description, we presume the Upper Green-sand formation contains it. Some workmen first of all discovered a series of caves, which consist of several chambers, about 24 ft. by 20 ft., and each chamber has a door communicating with the next. On the floor of the first cave broken into washed sand lay to the depth of 4 in., showing that running water had been at work, and further search proved the existence of a spring of water. Not content with this wonderful discovery the floor of the cave was broken up, and the explorers were rewarded by finding a "real lake of pure soft water." No mention is made as to whether fairy boats or the usual accompaniments of such underground finds were seen. We presume that our learned contemporaries will now give us "underground lakes," day by day—there is plenty of similar material, to work upon, and it would be useful from the point of view of water supply. This particular lake is said to be capable of yielding 500,000 gallons of soft water per day. The "caves" alluded to are doubtless old stone mines.

**THE** "Panagraph" invented by Herr Wilhelm Sabel, which is now on exhibition in London, is a wonderfully ingenious piece of mechanism, by means of which geometrical plans, &c., can be at once reproduced on any desired scale on stone or copperplate, ready for immediate printing. The instrument itself may be roughly described as an elaborate pantagraph, in which many ingenious mechanical and electrical devices are employed to get rid of friction. The operator simply follows the lines on the plan at one end with a style which is connected to an electric battery, and this, by pressing against a metal ruler, makes the circuit which actuates the graving tool over the stone block at the other end. Special rulers are employed for making dotted lines and curves, a rapid make and break of the circuit being all that is required. Herr Sabel also arranges the apparatus so that a second copy is made at the same time on a smoked-glass plate, and this second copy is useful, as when held up to the light it shows at a glance whether any

The Workmen's Compensation Act.

The Picturesque of Continental Towns.

Wood Seasoning by Electricity.

Electrical Transmission of Power.

A Novel Electric Engraving Mechanism.



line has been accidentally omitted. No special skill is required to work the apparatus, which does its work rapidly, and we satisfied ourselves that the reductions were microscopically accurate. The instrument, of course, takes up considerable space, and considering the mass moved, its freedom from friction is marvellous. This is in part secured by having the rods of the pantagraph attached to steel rollers running on a steel bearing, which is magnetised when the instrument is in action, and so ensures that the pressure is perpendicular to the direction of motion. The syndicate who have taken up Herr Sabel's invention will reproduce architects' and engineers' plans, reduced to any desired scale, on blocks ready for immediate printing, but do not intend to let out their machines. Messrs. Krupp, of Essen, and several German municipalities, have already employed these machines to have their plans reproduced. Herr Sabel is to be congratulated on having overcome difficulties with which he has combated for the last twenty-five years.

THE jury in the final competition for the decorative painting for the Salle des Fêtes of the new Mairie at Vincennes have awarded the premium to M. Chabas, who is to carry out the work. His painting is a decorative landscape, representing the Lake of St. Mandé with a mass of trees reflected in the water. M. Paul Schmitt, who obtained the second premium, has painted a view of the old Castle of Vincennes; and M. Victor Menu, who obtained the third premium, represents a piece of water in the Bois de Vincennes, also with a mass of forest with autumn tints. Decorative landscape thus seems to be taking a quite important and recognised place in French mural decoration. M. Menu, who designed the borders for the paintings of Puvion de Chavannes at the Paris Hôtel de Ville, is a young decorative artist of great talent, who is considered to have a future before him. M. Chabas, the selected artist, has already executed the decorative painting at the Mairie of the XIVth Arrondissement. The jury on the occasion consisted of MM. Cazin, Harpignies, and Guillemet.

#### THE LIVERPOOL ROYAL INSTITUTION COMPETITION.

This competition has resulted in only six designs being sent in, although two premiums of 50*l.* and 20*l.* were offered. The small number was probably due to the fact that the instructions were exceedingly vague as to the accommodation required. There is consequently considerable difference in the number and character of the rooms in the different plans submitted. The Committee apparently had only made up their minds regarding two wants: a large lecture hall to seat 1,250, and a smaller one capable of accommodating about 500. Alternative plans are shown by some of the competitors, explaining how a portion only—the large lecture hall—could be built first, and about half of the existing building retained.

Messrs. Briggs & Woitsholme, of Liverpool and Blackburn, to whom the first premium has been awarded, place their lecture hall, a room 84 ft. by 61 ft., on the ground floor, taking up, with the crush-room, &c., the whole of the left hand side of the site. The entrances and exits are very well arranged on either side of a crush-room behind the large hall. Two separate emergency exits are also arranged at the other end on each side of the platform. Over the crush-room is a gallery. This hall is lighted by windows high up on one side, and by dormer windows on both sides of the roof. The floor of the hall is level, the seats not being raised, and although the lecturer's platform is 2 ft. or 3 ft. above the floor, it is a question if it would

not be a trying room to speak in. The small lecture-room, 54 ft. square, which is in the opposite corner of the building at the back, would probably be a much better room for sound. The seats are arranged on the amphitheatre plan, and the back tiers are raised. There are two separate entrances to this. The retiring-rooms are well placed between the two lecture halls. On the same floor are committee, tea, smoke-rooms, &c. On the first floor there are two small lecture-rooms, two class-rooms, a library, two picture galleries (each 40 ft. by 28 ft.), and a sculpture gallery (34 ft. by 25 ft.), the last three being top-lighted. On the second floor there is little except a museum (56 ft. by 24 ft.) and a suite of rooms for the caretaker. The elevations are free Classic, and, without possessing striking merit, would probably be fairly effective. A fault may be found with the Colquitt-street front, that it looks too much like two distinct buildings, the end of the lecture hall being so different in character from the rest of the elevation alongside it. It is right, no doubt, to a certain extent, that the internal arrangement should be proclaimed on the outside, and when the whole building is erected something can, perhaps, be done to pull the design better together.

The second premium has been awarded to Mr. R. W. Bedingfield, of Leicester. His large lecture hall is placed at the back. The proportions, 100 ft. by 55 ft., are not good, the room being too long. The tiers of seats are raised at the back. The entrances are quite inadequate and are very badly arranged. There is one narrow entrance for members, and another for the public. The latter is a straight flight of fifteen steep steps leading from a very small entrance hall direct into the lecture hall at the back. The accommodation Mr. Bedingfield provides differs considerably from that shown in the design placed first. He shows five large class-rooms in the basement, and two more on the second floor. There are, besides, an examination hall (only 12 ft. high), two small lecture-rooms, a music-room, a large gallery, a museum and offices, dining-room, smoke-room, &c., in different parts of the building. The whole of the Colquitt-street front on the first floor is given up to a fine range of reception-rooms. His small lecture hall on the ground floor, 55 ft. by 30 ft., is only 13 ft. high from the floor, which is undoubtedly too low, especially as the back tiers of seats are raised. There is nothing particularly striking about the elevations.

Little need be said about the other designs. The author of one set places his large lecture-hall on the first floor, which is surely a mistake. The room is a long and narrow one. There is another design which has a great deal of character, and externally is perhaps the best submitted; but the plan is very faulty, and the entrances and exits to the large lecture hall unsatisfactory. Over the entrance doorway is a dome apparently of stone, and on either side are external staircases which lead to nowhere in particular. All the designs sent in are Classic in feeling except one, which is Gothic of a very poor type. The plan of this last one is, however, good. There can be no doubt that the most suitable design has been awarded the first premium. The assessor was Mr. Henry Hartley, F.R.I.B.A., of 8, Harrington-street, Liverpool.

#### THE ARCHITECTURAL ASSOCIATION.

The usual fortnightly meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street. Mr. G. H. Fellows Pryne, President, in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association, viz., Messrs. L. Blanc and A. Woodroffe.

Mr. E. Howley Sim, senior honorary sec., announced the donation to the library of the following books:—"Alphabets, Old and New," by Mr. Lewis F. Day, and "The Conduct of Building Work and the Duties of a Clerk of Works," by Mr. J. Leaning. A vote of thanks was accorded to Mr. Batsford, the donor.

The Chairman called attention to the first meeting of Professor Hulme's class on "Plane and Solid Geometry," on Thursday, the 8th inst.

#### ORIEL AND BAY WINDOWS.

Mr. Paul Waterhouse then read the following paper on "Oriel and Bay Windows"—

There is something unusually humane about

the rule of the Association which lays before the readers of papers, not merely the duty of producing an oration, but the subject of the discourse. The ordinary untempered request for a paper brings with it a double horror, for with the honourable burden itself there comes the duty of selection—a duty which, as the paper writer passes in review the possible titles of possible essays, so fills him with the sense of his own ignorance that the process of choice becomes merely a process of rejection, followed eventually by recourse (or shall I say relapse?) into some flattering selection of a theme where for the moment the mist of nesecience seems to hang less thickly than over the surrounding regions of architectural learning. The course adopted by the Association is more kindly. The committee gives one a subject—by what process of papers in hats, or balls in ballot-boxes, I do not profess to know. A subject and a man are mated and for better or worse are introduced to one another. There is blessing in the system—it saves a world of trouble, and is the means of introducing a large number of middle-aged practitioners to subjects of which they had previously no knowledge whatever. For the writer who is faced by an unresponsive title goes to his "Parker's Glossary" and his "Architectural Dictionary," drinks eagerly if not deeply at these fountains of knowledge, and comes smiling to his audience, refreshed with the sense of having put himself at least abreast of common knowledge in the subject which he has so lately made his own.

Alas! for the student of oriel and bay windows, the dictionaries give him but cold comfort under either heading. You will find there, to be sure, a wonderful turmoil over definitions and derivations. You will learn there that some consider the word oriel to be originally and properly applied to the projecting windows of medieval dining halls, or to that part of the refectory occupied by the monks who were slightly indisposed, while others hold that it originally connotes a recess for an altar or for prayer, whether a window or not, and that it certainly cannot properly be applied to the bay window of a banquet hall.

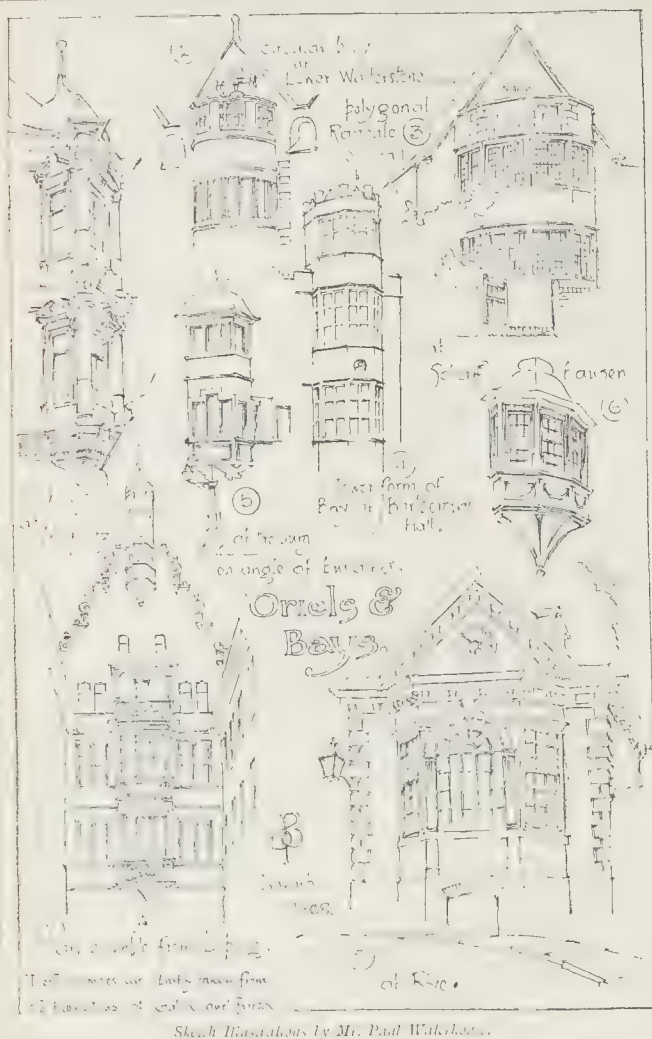
Oriel, to pray, is, say some, the foundation of the word, making it, apparently, synonymous with "oratory," while others see in it the Saxon for an "eye-hole," though why they should overlook the fact that oreille (a seventeenth century spelling of the word) means an ear and not an eye, nor why again the oriel window should be considered more of an eye-hole than any other kind of window, is more than I can say. Another derivation connects it with *Arcola*, a diminutive of area which in certain senses is the equivalent of the "halo" of Greek origin—and, indeed, the similarity of the term *auricle* (plausibly based on *aurcola*) favours this source, which is probable enough when one considers that circularity is the essence of the "halo." A high authority takes *aurum*, gold, as the root of the word, but his arguments are more convincing from an etymological than from an architectural point of view.

Plunge, if you desire it, into the controversy on this topic in the IVth Series of Notes and Queries, and you will learn at least enough to induce you to drop the use of the word altogether.

Probably you will conclude with me that the ancients used the term a good deal more loosely than even we are tempted to do; and that an oriel, like a "yorker" and a "gentleman," is one of those things which can be better understood than defined, also that it makes no great matter for example whether you restrict the term to bay windows which are corbelled out, or extend it to those whose form continues down to the ground. In common practice we certainly understand an oriel to mean a bay which does not extend to the ground.

Busybodies have been at work, too, even with the innocent term bay window, which most people can understand by the light of nature as meaning a window whose bulging form, whether polygonal, semi-circular, or segmental, produces on plan a bay-like addition to the room it affects. But some wisecrack has produced a glossary of terminology to qualify the word. We are taught, for instance, of the "square bay" and the "canted bay," of the "compass bay" and the "square and compass bay," of the "bow bay" and the "square and bow bay," and lastly of an elliptic horror entitled the "cabinet window"!





Sketch Illustrations by Mr. Paul Waterhouse.

A modern tradition often enforced upon young gentlemen under articles of pupillage confines the term "bow" to the circular forms, and "bay" to the rectangular or polygonal, while yet another refinement of etymology would banish the word "bow" altogether.

Let it suffice to say on this unprofitable topic that the ancients called them all bays, whether they had or had not angles in their composition, and that there are many examples to which we cannot deny ourselves the luxury of applying the gracious and expressive term bow.

Thinking the matter over, it has seemed to me that we may well avoid in this evening's discussion both the etymological question and the archaeological. An historic treatment seems undesirable, and even the constructive aspect, important as it is, may well be laid aside for a season in favour of the attractive subject which I may call, for want of better title, "The Morality of the Bay"—I mean its properties and its proprieties, and the rights and wrongs of its uses and significations.

Has it ever occurred to you, in thinking about bays, that they are bound to be either the glory or the shame of the building to which they are applied?

A bay window is, in the literal sense of the word, an extravagance, by which one means, not merely the escape of money from somebody's pocket, but a deliberate variation on the part of a building from the normal boundary lines of common construction.

Now, it is in the nature of extravagances of all sorts that they must either be successes or failures, and the rule applies to bows and bays. They challenge attention both from within and from without, and if the attention they attract amounts to unfavourable criticism they bring shipwreck on the building they encumber.

Let us think of the objects for which these excrescences exist. They are few, and consist of—

1. The desire to increase either the size or the amenity of a room.
2. The desire to enable the occupants to look out obliquely or even sideways without putting their heads out of window.
3. The desire to attract oblique sunshine to a room; or finally
4. A desire which is at once the most attractive and sometimes the most fatal of all—pure ambition of a worthy or unworthy kind. Ambition is as happy in its literal application as was the word extravagance. Meaning as it does a certain "going round" it touches in its primary and literal no less than in its secondary senses the essence of the ambitious bow.

It may seem absurd to some of you to go thus intimately into the rationalities of an architectural feature; but I suspect that we architects can lose nothing by any attempt to study the true significance of any of the items out of which we compile our compositions. There is one special reason for thought in dealing with such a matter as this—namely, that if we find

ourselves dealing in bay windows merely for looks, it is of vast importance to be sure of their excellence and of their propriety. I am not arguing that utilitarian reasons only are the proper grounds for their application, but wish emphatically to mark the necessity of ensuring appropriateness in the bay which is merely a luxury.

We are all familiar with the commonest of all examples of inappropriate bays—I mean the almost invariable excrescence which decks the speculative villa. But let us be sure, in condemning it, that we condemn it on the right grounds. Ambitious as these features appear, there is generally an economic reason for their existence. Sometimes they are one story high, sometimes two, and, in either case, the use of this unlovely addition is generally dictated by one of architecture's fundamental laws—the economy of space—which is the economy of material. The one-story bay tells the passer-by, not merely that the speculative builder wished to give a spurious gentility to his drawing-room at the expense of the garden, but that, desiring to put on the ground floor a room of larger capacity than that of the floor above, he hit upon the bay as the best expedient. Even where the bay is two floors high, thus belying the reason just given, another cause may be at work. Without the bay, there would have been the need of making the wall of the large front room line with the wall containing the front door; in other words, the room would have had to be cramped or the entrance lobby unduly lengthened. In fact, the common villa bay, so far from being an ambitious luxury only, is generally born of the desire to keep down the cubic contents. So much for its shape, its plan, and its capacity; as for its decoration, that is another matter. That it is generally stop-chamfered on every stop-chamferable surface, that it has what they call a patera in the middle of every lintel, and that it boasts of columns of the fern-leaved order of Gothic—all these things are to its shame, but they do not disqualify its original title to existence. Some one should write an article or even a book, on the cost of ugliness. The pathetic squalor of middle-class homes is greatly due not to the absence of unattainable embellishments, but to the addition of the undesirable. I know a town in a good stone country, inhabited by persons of comparative wealth (for it is the country home of a neighbouring business centre) the architectural appearance of which has been hopelessly ruined by sins not of omission but of commission. I suppose that if, on an average, 10l. less had been spent on every one of the houses in that place, it might have been comely, whereas to-day it is loathsome. It bristles with bay windows, of course, and they have nearly all got stone dressings, but there is scarcely a square arsis to be found in the town, and not a chamfer but is mutilated with fancy stops. If all these chamfers had been run out to their legitimate terminations, or better still, if had of them had never been at all, if all that square sunk foliage had never been square sunk, if all those paterae their creators call them "paterasses" had never been cut, the builders might have been richer, the rents might have been lower, and the town itself might have been natural and beautiful instead of looking like the purgatorial region which lies between the Angel and the Seven Sisters-road.

Alas! for the villa bay, its existence is justified, but its usual development is one of the darkest sins of architectural wantonness.

I have mentioned, as one of the legitimate causes of the bay window the desire to obtain an oblique view from the room. To this cause is due the well-known and often gracious feature which one may call "the seaside bay"; with this we are all familiar, and happily we are able, among the bays of this class, to distinguish a successful as well as a disgraceful variety. The Englishman's cultivation of the seaside dates practically from the last century, and probably the desire on the part of landladies to claim a sea view as an excuse for additional rental is coeval with the birth of watering places. It is to this excusable rivalry in the possession of a glimpse of salt water that we owe, in most marine towns, the amiable belled fronts of the streets which run at right angles to the coast line. Without the use of bay windows a sea view in such streets would be impossible; with their employment comes the possibility of such a view—a little strained, perhaps, in the further buildings, but still appreciable; just worth having and just



worth paying for. Indeed, so identified in our minds is a street of bay windows with the mental image of a seaside spot, that the very look of certain houses suggests the sea as much as do bathing machines and a smell of tar. There are people who will tell you that they can smell the Channel on the north side of Hyde Park; but it is more a question of eyes than nostrils. It is, in fact, the existence of a row of smiling, sunlit houses planted along one side of a broad street only, and, above all, the prevalence of bay windows, and especially of bay windows in certain transverse streets that cultivates the illusion—one falls irresistibly into the trap. You remember how in Liberty Hall the old man says there are more "burials" than "blooms" in Bloomsbury. One might transfer the pun to Bayswater where there are more bays than water, but the former do so connote the latter that they set one at least thinking of sand and waves, though all the time the houses are bowing and belling and jostling round one another's shoulders for a peep not at the blue ocean, but at the green trees and grass. Oh, those sea-side bows—the real ones (not the Hyde Park ones)—how well we know them! The modern varieties are tall and pert, not circular, but octagonal, and bastard octagons at that, with one gaunt oak-grained sash in the centre light and two thin and equally tall ones in the side lights. And then the brickwork all covered with pale stucco, and the weak lead roof that lets the wet through! The old ones, how different and how insidiously attractive! As I write I think of one which, on plan, is about a third of a circle; it is divided into three parts of equal size, all made circular of course, and between them comes no brickwork, but just the sash boxing, so that, in fact, the entire construction is of wood; on the floor above the running of the front room over the entrance passage made the bay unnecessary for space, but unwilling to give up the lines of the bay, whose delicate curve means so much to the expression of the house, the designer continued the treatment, and added to its emphasis by a light metal roof of similar form, covering a curved balcony, with a balustrade of ironwork. A great deal of the charm lies simply in the shallow curve and in the appreciation, however latent, of the slight extravagance of the circular joinery. The cheap building of last century or of the early nineteenth century seems never to have denied itself circular joinery; but to-day—probably owing to the prevalence of machine-made mouldings—circular work is apparently the first thing one has to give up in the attempt to save money. In the circular sashes one's satisfaction rests not merely in the delicate form of the sweeping segment, but also mentally—and perhaps unconsciously, in a sense of the added labour, in which there is a gleam of Ruskin's lamp of sacrifice. Not that the later nineteenth century knows no extravagances. The householder who shrinks from laying out money on the refinement of a long-radius curve would scorn to be without his stained-glass "kingfisher" in the panels of the front door, and will probably run to tile risers for the steps. Can it, oh, can it be a fact that every age of building finds at last some corresponding period of admiration, and will it ever be the lot of some degraded generation to cherish a cult of to-day's abominations? Will there some day be talk among the as yet unborn of the good old days of our great-grandfathers and their cathedral-tinted door panels, their delicately tiled halls, their winsome stop-chamfers, and their charming bay windows, the angle piers of which were formed sometimes of quaint wire-cut bricks, covered with grey cement rendering, and sometimes with dainty cast-iron columns with neck mouldings four times the true Palladian size, and branching capitals cast in the similitude of the common polycedy.

Such a day I hope can never come; or rather, when the time does come for our great-grandchildren to pass judgment on what is left of the bricks and mortar of to-day, they will have before them such a vision as we cannot have in any of our retrospects. There is in the work of to-day a visible contrast between the good and the bad such as is not to be found by any searcher of our time in the recesses of our past. The contrast-line, unhappily, does not lie between architects' buildings and builders' buildings; for, to our shame be it spoken, there are things bred on the drawing-boards of men who brass plates which have to find themselves classed on the wrong side of the line. But that the contrast exists there can be no doubt, nor can there, happily, be a doubt that there are

many beautiful things—bay-windows among them—which will do as happy resting-places for the eyes of our antiquarian descendants.

But we are getting away from the bays, which, to do them justice, set one thinking and drive one's thoughts afield. In bays of the circular form—and, indeed, in polygonal ones as well, but perhaps specially in the former—it is important to remember, as a designer, that the plan form, whichever is adopted, is the most important thing about them; that it must be cherished and led up to, and that finally it will accomplish more of its mere self than a person of moderate experience would expect. Perhaps it seems unnecessary to say this, but there is a special reason for emphasising the observation. In the actual process of designing we deal necessarily with orthographic elevations as a means to our end. A similar bay window put on to an elevation is a comparatively dull thing. You, as architects, realise its circularity on your own, by the toil of drawing in the mullions in oblique elevation. But the drawing does not tell its full tale of effect, and you may be tempted to attach an (apparently lacking) interest to the member by some addition to the simplicity of its lines—some crowning feature, for example, or an addition to the centre of the cornice, if there is one. In this there is danger of error. The circular or segmental plan once adopted, you cannot serve its end better than by the accentuation of the horizontal lines which partake of the circularity. Herein lies the difference, or one of the main differences, between those old bays that we admire (be they stone and Tudor or wood and Georgian) and the modern horrors in which hang the "apartment" labels. The modern bay makes for height in its apertures; it avoids bars, especially horizontal bars, in its glazing; transoms are probably altogether absent, and the piers are made thick and heavy so as to break even the moderate continuity of the sashes, meeting rails and of the heads and sills. With the older types this is different. Copious window bars (or in stone work well defined transoms) perform the double office of breaking-up undue verticality and of emphasising the plan-form of the bay, while the small piers, mullions, or sash boxes only produce as much intermission as the eye (that unconscious arbiter of stability) demands as a guarantee of sound construction and as a preventive of the worst of all faults—the over-bowing lintel. If you do not know what I mean by this last, ride down Oxford street on a 'bustop and look at the excrescence which is the sole feature of the Frascati restaurant. To design a bay of this description, you take a centre on the frontage line of the building (or a little outside it if you prefer to increase the effect), and turn a wall circle the inner radius of which is only about three times the length of the thickness of the wall. Here you have produced on plan a semicircular bay which you proceed to embellish by the insertion of one mullion. To be sure, the omission of mullions altogether would have made the thing more startling, but the one mullion gives the public enough to reflect about with some sadness. As they pass the building they naturally and generally view it obliquely; the eye glancing across the curve which looked so fair on plan, and at least respectable on elevation, takes a straight line from the edge of the single mullion to the jamb, and above it they see transome and head vaulting their unsupported circularity.

This sad example leads to what one may call an axiom of all good circular work, that the vertical supports must always be sufficiently close together to prevent the appearance of the horizontal members being unsupported. This rule is, in one sense, the counterbalance of what I mentioned before—the need of emphasising the horizontal members; but it is surprising how little, how slender, the vertical supports may be and yet satisfy the eye in this matter. In the old inn windows of many a coaching hostel the slimmest glazing bars between the glass panes are enough to prevent the eye being troubled by any optical instability. In the splendid segmental or semicircular bays, which are the glory of some of the country houses of our English Renaissance, the mullions are always so placed that there is no chance of offence in this respect. It should be borne in mind that the relative closeness of these vertical supports is necessitated and regulated, not by the measurement of the length of segment, but by the length of its radius. The flatter the bay, in other words, the less need for the frequent support.

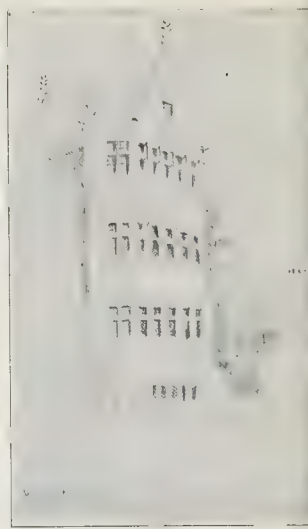
It will readily be understood that the greatest importance attaches to the way in which a bay is covered in. Obviously a bay like other structures can be roofed in either of two ways—either with a flat roof or a sloping one. If your bay extends upwards to the whole height of the building its roof may possibly form a part of the general roofing of the house. This, which is often a successful treatment, needs handling with great caution, especially if the bay is large and the building comparatively small. In a very large structure the roof of the bay, whether polygonal or circular, can appropriately be formed as a member growing out of the rest of the roofing; or it may even, if the plan of the bay be part of a regular polygon, or of a circle, take form as a turret, and rise above the apex of the normal roofing. It is, however, very often the lot of a bay window to be the largest feature, or one of the largest features of a comparatively small house, and in such a case the use of a high-pitched roof of such wide span, with eaves at the level of the general eaves will often result in the production of a feature whose size will swamp not only the building, but with it the bay itself. It may easily happen that the architect finds himself driven to the use of a flat invisible roof for his bay for this very reason, that any form of sloping roof would work itself out into something too gigantic for the scale of his building.

There is one treatment, popular some few years ago, which I think we may unhesitatingly condemn as inappropriate in nearly all cases. It abounds in the neighbourhood of Fitz-Johns-avenue, and consists in the cheerful expedient of clapping a gable of the full width of the bay on to the unfortunate erection, which is placed in the difficulty of reconciling its own polygonal form with the square structure which surmounts it. The problem is usually resolved by one of two expedients. Either the canted angles of the bay are treated as gigantic chamfers, and brought to the square by the usual latter-day expedient of a vast stop, or corbeling, or the gable, which is at times half timbered, gets its triangular soffits supported by a bracket. These expedients, particularly the bracket business, are unhappy at best, for they cast a shadow on to the splayed windows, besides offering gratuitous harbourage to sparrows and their nests. If a bay must be surmounted by a gable, there are ways of getting over the difficulty. One may make the bay itself square and so produce one of the most beautiful features that can be devised. Indeed, so successful is the appearance of the square bay under a gable that where this form is used one can tolerate a greater width in the gable, and a resultant soffit on either side, though the triangular soffit left by the polygonal bay is so so far from tolerable. All good rules have their exceptions, I suppose, and there are buildings of bygone days which successfully carry through even the problem of the square gable on the canted bay. You may see an example in the "Talbot Inn" at Oundle, of which I have provided a sketch. The homely satisfaction of this building goes to prove that our forefathers could sometimes succeed where their descendants generally fail.

On the whole, one of the most beautiful treatments, though a very unusual treatment, of a gabled bay of polygonal form is that of which one finds an example at Weston, an old house between Leeds and Ilkley. In this case the front or flat wall of the bay runs up to form the gable face, and the splayed sides are surmounted by parapetted wings with finials. The wings having horizontal copings do not, of course, exactly follow the line of the roof. Viewed from the back, if one could so view them, they would present the appearance of triangular blanks, but there is no great harm in this, nor, indeed, would there be any harm in their following the roof line. A gable formed on a canted plan is often very successful, as those will agree who know the gabled apse of St. Michael's Church at Folkestone, where the gable is like this at Weston, so to speak, three sided.

In cases where the bay we are dealing with has walls which are lower than the main walls of the building the roofing difficulty is often nearly as great, at least, where pitched roofing is attempted; and the difficulties in this case are caused by the intersection of the bay roof with the vertical face of the main wall behind. It is obvious that the roof of a segmental bay, if projected at an oblique angle on to the main wall, produces nothing more or less than one





of those eccentric outlines which the geometers know as conic sections. With a polygon—if it be (as it generally is not) the exact half of a regular figure—there is no great difficulty as the centre of the figure will line on the wall line, and the roof can be brought up to a true apex with regular mitres on the hips. When the figure formed by the plan of the bay is something less than the half of a regular polygon a little cooking is sometimes indulged in with results which are elegant on the elevations but disastrous in the eyes of ordinary spectators, who cannot be induced to see things as they would appear on a drawing-board.

Generally speaking canted bays are not parts of regular octagons, but have their canted sides less than the front. In such a case there may be a small piece of straight return between the cant and the wall. It then becomes necessary to regulate matters so that the hips of the canted sides shall exactly meet on the wall-line, otherwise a roof is produced which nothing but cooking can save and which the said cooking will generally shipwreck.

In this connexion it is well to observe that many of the best old examples, particularly in Tudor and Renaissance work, have no square returns at all and further that the angle of the cant is frequently flatter than 45 deg. There is, to be sure, an objection to the practice of allowing a very flat cant to die into a wall face without the intervention of a square return, namely, that the mouldings of the bay become unduly developed in their incidence upon the wall. This difficulty has to be met either by extreme modesty on the part of the mouldings which have, in fact, to moderate their projection, or by continuing the same mouldings on the wall face as strings or cornices.

On the whole, there is a good deal to be said against pitched roofs for bays of the lower description, unless it be in the case of those with roofs of weathered masonry. In these it need hardly be pointed out, the *planning* must be done in strict regard to the form which will be brought about by the intersection of the roof slope with the back wall.

There is one simple consideration which often altogether upsets the possibility of applying a sloping roof to a bay, namely, the height which such a slope occupies upon the wall space. If your bay projects 3 ft. it is obvious that with a slope of anything over 45 deg., a pitched roof with its flashings will make a window for the room above almost an impossibility unless it still be at an unusual height from the floor.

The corbelled windows, to which we generally and perhaps incorrectly apply the term "oriel" are frequently covered with high-pitched roofs of masonry, but with this exception the bays of mediæval, Renaissance, and Georgian architec-

ture—in fact, all the best bays of our ancient periods are covered with flat roofs, or with roofs so flat as to be invisible behind their parapets.

The roof in these cases being of no account architecturally it remains to be considered how the parapet is dealt with. Some of the best examples in this, as in other departments of architecture, are the quietest. I noticed the other day, in a remote East Coast village, a plain brick house, whose only challenge for attention was a front door and two bays. The bays were canted, and very flat, and they extended to the whole height of the wall—in fact, their coping, a 3 in. York stone, was level with and identical with that of the main house wall. Our modern Georgians would have put a ball at each of the angles, and the balls would have looked very well, too. I shouldn't blame them. The composition I am speaking of, simple as it was, did without the balls, and looked as nearly perfect as things of the kind can look.

It was as if a plain brick front, adorned only with its necessary openings, and its equally necessary coping had been taken and bent in two places to form the bays which, with the door, were the only ostentations of the house. The roof, of course, ran straight, and the slight projections of the bays were covered by a lead flat, which was little more than an extension of the gutter of the main roof. In these cases we have the simplest treatment, which, however successful, is no argument for the suppression of all more ambitious conceits. Parapets in all ages have been things to play with, and the bay being the luxury-point on a house's front is not the feature to forego all licence. Our old friend, the battlement, used even by the ancients, as much for ornament as for the defensive objects which his warlike name implies, is a frequent infester of the tops of bay windows. He is not inadmissible, but he should be used with care. Too big he becomes gigantesque and ludicrous; too small he is lilliputian and again ludicrous. Even when the proportions are sound he may break up indecently the horizontal continuity which I have spoken of earlier as one of the secrets of success in a bay. Open work of most kinds involves piers and these again, though very valuable in the canted bay as implying strength at the angles may introduce an ill-placed verticality. Our modern trick of the festooned or swooping outline is sometimes happy but is better employed on the straight-sided bays than in the circular, and the same may be said of finials (balls or other forms) unless they occur with such frequency as shall cause an effect of *series* so as rather to carry the eye along the line we are emphasising than to interrupt that emphasis.

Where indulgence is taken in open-work parapets or in finials or other means of break-

ing the outline it is still possible to maintain the emphasis of plan form by a cornice of some vigour. There is, especially in the circular forms of bay, a marvellous charm in the simple bending of a moulding, however unelaborate, to the selected form. Even a plain unmoulded band, say of stone, among brick-work has its value, and in cases where the bay is not mulioned, but pierced with large sash openings, it is difficult to overestimate the importance of all the horizontal bands in giving continuity to the form. A base will often help—even a simple plinth with the smallest possible projection; just enough to catch the light and continue, so to speak, the message of circularity.

It is time to say something of those bays whose form is not continued downwards to the ground level. The simplest way of treating such a feature is obviously to cut it off flat, and, strange as it may seem, there are many examples of such bays on a small scale and in wooden construction which are singularly successful and happy in effect. The bare idea is contrary to all one's notions of propriety, and the bald simplicity is helped in many cases by a slender wooden corbel or cantilever, which makes no pretence of really doing the work; but the fact remains that in many old villages, such as those which happily still surround London, there are small bays of this description with absolutely plain soffits which are not by any means unpleasant in their appearance.

The corbelled-out bay, to which, as I have mentioned before, some authorities restrict the name "oriel," is a more favorite feature in foreign architecture than in our own. If you look through the pages of those two monumental works on the Renaissance, I mean the "Denkmäler Deutscher Renaissance" and Mr. Gotch's book on our English buildings of this same period—you will be struck by the fact that, whereas bay windows abound in both, the German examples are very largely of the corbelled-out variety, while the English ones are almost invariably of the simple, solid, down-to-the-ground type. Where the Englishman broke loose was in his timber work; his bays in wood-work are sometimes marvels of projection, but in stone the Briton was ever more modest than his foreign rivals. It may be said to the credit of the English that they have never been very over-reaching in the matter of corbels. Visible stability, even in the wildest days of the early Renaissance, has always been as much revered in English architecture as it was ignored elsewhere. There are nations whose natural impetus has led them in architecture to the production of portents. It has been their aim to make stone look like a lace pocket-handkerchief, or to run it fine with corbels in real buildings as a child sports with gravitation in his box of bricks. These tricks have not been English tricks, and where they grow





on English soil they are of foreign planting. We may be known by our bays and bows as by other things, and our solidity is something of a virtue. At the same time, one must allow a certain beauty to even the extravagant German frolics. Those bays in particular which grow out of the angles of a building are sometimes of singular grace, and when they are of the square type are often so arranged as to do no violence to the sense of stability.

I had promised not to go into the construction question, but there are one or two points of appearance so closely allied to construction that I cannot conclude without a reference to them. First, as to bays at the angle of buildings. It is a common fault, and a perfectly avoidable one, to so place a bay at the corner of a room that the carrying of the wall angle either it becomes to inquiring spectators a matter of conscious or unconscious anxiety. Of course one knows there is some jugglery of rolled steel joists going on out of sight, but there is no reason why the unconscious faculty which asks building construction questions on its own account should have been worried at all. It is perfectly easy to so plan a bay, circular, or square, or polygonal that the normal wall angle shall be either upon or slightly outside the line of the bay. This gives no detriment to the effect within, and is a great relief to the spectator outside. To have anything so cardinal as the angle of a building apparently descending into the untrustworthy embrace of the lead flat over a drawing-room bay is, to well-ordered minds, a sin.

There is also sometimes a sin in the popular collegiate device of a corbelled bay over an entrance-archway. It may be all right in appearance, as well as in construction, particularly if the corbelling is not pressed too hard on to the arch. If well arranged the corbel and its burden seem only to be paying a compliment to the stability of the arch, but if once you get anything approaching to a collision between the arch moulds and the corbel the result is miserably weak—at least in looks. If close quarters are essential some form of keystone treatment is the only possible expedient. One may make a classic or semi-classic keystone the base of a corbel where it would be impossible, on grounds of appearance, to let a corbel take liberties of trespass with a Gothic arch.

It is time for me to draw these rambling remarks to a conclusion, and I feel the lack of any great central doctrine or leading truth with which to pull the subject together. These bays of which we have been speaking grow more in the house than in the palace; indeed, the monumental styles of architecture find less opportunities for their use than the more strictly domestic. The bay has no place in the Palladian method, and though one may find here and there a classic clubhouse whose smoking-room has an excrecent window claiming the name of bay, you will discover it to be disguised outwardly by some tortured colonnade whose insulted entablature seems to be only waiting for the time when it may

go back to the straight again. Gothic architecture and the freer Renaissance styles gave the opportunity of using bays even in buildings of size and dignity, but the bay as we have ordinarily to deal with it, is the appendage of a house—of a home.

Its importance as part of a design can hardly be exaggerated. It is, if one may use a homely simile, like the nose on a face. Add 10 per cent. to its size, or take a degree from its flexure and you may ruin the countenance—I should say the elevation—to which it belongs.

A young architect not infrequently opens practice by "throwing out a bow" for a relation. The simple manoeuvre is thought to be a safe task to entrust to an unrisen genius. Confiding friends! They little know the risks they run. To be sure, the money-hazard is less than that of the cost of a house, but they little understand the test to which they put their aspiring architect. You know Tennyson's poem of the flower in the crannied wall—

"If I could understand," he says,  
"What you are, root and all, and all in all,  
I should know what man and God is."

The knowledge of the little is a test, a proof, of the knowledge of the great—of all.

So with your bit of a bay window. It isn't any fool's job. There is a task for eye and hand, a task for the senses of proportion and propriety, a task, in fact, for all the powers that go to make an architect even in the least of these trifles. Bays and oriels are not to be despised. If a man can design them, it is, perhaps, a sign that he can design most things.

"Throw out your bays" by all means, and if you can do them worthily you are probably capable also of throwing up your town halls and your palaces.

Mr. Leonard Stokes, in proposing a vote of thanks to Mr. Waterhouse, said he need not say what an admirable paper it had been; they all knew that; but he felt, if he might say so, a little annoyed that Mr. Waterhouse had justified the use of the jerry builder's bay. Mr. Waterhouse seemed to think that its use was an economical way of getting floor space; he (the speaker) had been trying to work out whether that was so, and he rather doubted it. He would like to take out the quantities and compare the cost of the bay with the cost of the house, for he thought that the size of the house could be increased more cheaply without than with the use of a bay. The jerry builder's bay produced a great effect, no doubt; he had passed along a street that day in which there were fifty-five of them all exactly alike, and all in a row. But the bays to such houses were really useless, and the inhabitants of the houses in which they occurred generally recognised that, for they kept the venetian blinds down and smothered the whole concern with elaborate art curtains. There was one form of bay which Mr. Waterhouse had not execrated as

much as he might have done, viz., the form which was really more a gulf than a bay. It was generally seen bulging out at the corner of a villa, and both internally and externally it was a most objectionable feature. He should strongly advise any one not to attempt an angle bay of any kind, but of course a bay might be placed near an angle. The architects of past days did, more or less successfully, use angle bays, but the problem was a most difficult one, and seldom quite satisfactory. Mr. Waterhouse had said that it was not absolutely necessary always to use the 45 deg set-square when designing a bay on plan. He should like to go a step beyond that and say, *never* use the 45 deg set-square when designing a bay on plan. As a rule, the 45 deg. angle was an unfortunate one, though there were some illustrations before him that showed that that angle could be employed successfully. He agreed with what Mr. Waterhouse had said, viz., that if they could satisfactorily design a bay, they could design anything, because a bay was a most difficult feature; and if they could not design a bay, they had better give up architecture altogether, the speaker thought. He was glad to hear what Mr. Waterhouse had said as to the sins of commission which should be omitted. As he had said it was far better to omit embellishment almost altogether. Simplicity and proportion were the foundations of all design. If the bay were designed in good proportion, without a lot of ornament, it would be satisfactory; and if not in good proportion they had better give the matter up, for no amount of ornament would make an ugly-shaped bay look well. In a good many English towns there were to be seen a large number of badly-designed, over-ornamented bays, all helping to make the streets ugly and to turn even architect's houses into villas. What he pleaded for was simplicity.

Mr. F. T. Baggallay, in seconding the vote of thanks, said the paper was a most useful and suggestive one, and the lecturer's ideas were conveyed in a most felicitous and humorous way. All architectural ideas—and, to some extent, all artistic ideas—were apt to get into a sort of amorphous state, and it was occasionally necessary to hear such a paper in order to get a few crystals of definite opinion out of views which were sometimes rather confused. The subject of names was a rather unprofitable one, perhaps, but he thought that it was a good service to any vocabulary to give definite meanings to words, and whatever the derivations of such words as "oriel" and "bay" might be, he would suggest that it would be useful if architects could agree among themselves to limit the meaning of oriel to a bay that did not go right down to the ground. As to definite rules for this, that, and the other there were some words in one of the Bab Ballads to the effect that "it is not so much the wooer who woos, as the wooer's way of wooing," and those words, he thought, might be applied to architects in the following way:—"It is not so much what an architect does as the architect's way of doing it." He had come to the meeting rather prepared to advocate that if bays were used at all, there should be plenty of them; that the less bay there was the more likely it was to be unpleasant, and the more bay, the more likely it was to be successful. He had been thinking of some series of lofty bays which had a very dignified effect, and he had contrasted them with the bays of the speculative builder, which were, as a rule, one story high, and very ugly. Though his views had been a little modified since hearing the lecture, he thought that, as a rule, it was safest to carry a bay up, if not the whole height, at least two or three floors, and if possible to repeat it. The treatment of a single bay was very much more difficult. With regard to the roof of a bay rising above the normal level of the roof of a building, he did not know if he had understood Mr. Waterhouse correctly in saying that sometimes that might be done successfully. In his (the speaker's) opinion, it was a most dangerous thing to attempt. With a roof of a comparatively small feature, like a bay, rising above the normal level of the roof, it would attract to itself the whole attention and would dwarf the general composition. He did not know how many examples he had seen during the last six months of that disastrous tendency, which had a most unfortunate effect on a building. Mr. Waterhouse said it was undesirable to have the angle of a building coming down to the roof of a bay. He (the speaker) went farther. His idea was that it did not look safe on the pier in the middle of the bay; they had better take it



beyond that point: it would add greatly to the visible stability of the building.

Mr. H. H. Statham said, in reference to the economy of bay windows, that he did not think they were introduced really so much with a desire to obtain a larger floor space as to make the tenant think that he had got it. If the bay window were taken away, the front wall could be advanced a little, and the floor too, but without the bay the tenant would not think he had such a large room; with the bay he was persuaded that he had a larger and more commodious room. As to the question of nomenclature, he had always understood that "oriel" did mean the variety of bays that did not come down to the ground. As to the question of angular or segmental bays, he was very much in sympathy with Mr. Waterhouse in his evident affection for the segmental bay, and he thought, while Mr. Waterhouse was reading his paper, of a house at Eastbourne, near the east end of the sea-front. It was a much older house than many of the sea-front lodging-houses, with their bay windows, and it belonged rather to old Eastbourne; it had a large, wide, bay window of a rather small segment of a circle, which gave at once a look of distinction to the house; it was not the ordinary, commonplace, canted bay window. Sometimes a very shallow segmental bay would give that sort of distinction to a house, without taking up room which could not be conveniently afforded. There was a rather good example of that in an office building recently erected in Walbrook; it was in a narrow street, and the architect had treated the front of the office in three very flat segmental bays, just enough to break the line of the wall without any encroachment on the thoroughfare; and he thought that that was a rather happy treatment of a front to a narrow lane. With regard to the canted bay, it was an important question as to the little return joining the main wall, always seen in the common builder's bay. There was often a better effect in carrying the canted side right into the main wall, without any break. As to the angle of 45 deg., he was a good deal in sympathy with Mr. Stokes; but it depended on the architectural character of the house and upon the way in which it was intended to treat the bay. If it was a house of rather severe classical style, and if they wished to give a very symmetrical treatment to every part, they might find the 45 deg. angle the best for the purpose, leaving the two angles equal; but if the house was less pretentious and more picturesque in character, it was better to avoid the angle of 45 deg.

Mr. Alexander Payne said he could give a practical illustration on the blackboard why bay windows were more often introduced into buildings in London now, and why they are likely to be much more largely used in the future, owing to the provisions of the London Building Act, 1894. Suppose, in a street 40 ft. wide, two builders bought the land for building purposes, each taking half. One builder put his house back, and so forms the line of frontage. As soon as this was done the second builder could not come beyond it, though he might introduce bay windows, which would project from the line of frontage. That was a practical reason why bay windows in London were likely to become more general. The number of houses built at the beginning of this century with bay windows running up several stories was quite extraordinary. In the suburbs, there were whole terraces of them, sometimes with wide window openings in front with arches over, curved on plan, to which iron columns had to be added afterwards, to support them. The importance of the bay window could be realised if one took some illustrations of modern residential houses and just blotted out all the bay windows. What a gap would be made! A bay window was one of the most important features in a modern house, and Mr. Waterhouse had dealt with it in a most humorous and interesting way.

Mr. Thomas Blashill said he had hoped Mr. Waterhouse would have told them exactly what an oriel was and what a bay was, for when a case relating to that feature of a house came before the magistrate, as no doubt it soon would, it would have been convenient to turn to the paper for a reliable definition. The section of the Building Act of 1894 relating to bays was inserted with the amiable idea that some variety would be produced in the streets of London as a result. It was thought that the houses in the streets of London were too flat, and as application was constantly being made to the London County Council for permission

to put in a harmless bay window, it was thought best to put a provision in the Act, so that people could get the bay window running up from the ground (which was what the Act meant by "bay") and the oriel. He did not agree as to the uselessness of the jerry-builder's bay window; it was a feature employed with the idea of improving the appearance of a row of houses. That was the aesthetic reason; but there was the practical reason, which was not simply to get a larger floor area, but for the sake of convenience which in small houses, could not otherwise be obtained. In such houses the bay window was arranged for in order to accommodate the inevitable table which people loved to have in such a position—the table on which they put the family Bible, or a globe of gold fish, or a microscope. People seemed to think that these things were necessary in the front parlour, and so provision was made in a bay for a table without encroaching much on the floor space. Mr. Waterhouse's remarks as to the angle-bay window rather saddened him. He remembered seeing in one of the professional journals about twenty years ago an angle-bay in a house at Hampstead for the first time. Everyone thought at the time what a charming feature the angle-bay was, and it was largely copied; but now people were rather tired of it. He quite agreed that there was too much of the angle of 45 deg. in bay windows. In a house which he erected once, he adopted the form of half a hexagon, with an angle of 60 deg.; that was a convenient arrangement in regard to the roof and also in the way of execution. As to Mr. Stokes' remarks about simplicity and proportion, he (the speaker) heard a very able and cultured gentleman lecture on architecture about three years ago, and the burden of his remarks was that there was no such thing as proportion in architecture! That was just the opposite view. He (the speaker) was very much in favour of the bay window, notwithstanding what had been said; it was really a very interesting feature if employed properly. In many modern German towns the bay window was being used very largely and in very good proportion, by bringing it out square with columns at the angles; and in Palladian or Classic architecture it was not at all an unsuitable feature. The bay window broke the line of front and enabled the occupants to look up and down the street. He had so often heard blank walls and bald-looking houses criticised that, notwithstanding what had been said by the lecturer, he was of opinion that in long street frontages architects ought to be thankful for the opportunity of using such features as bays and oriels.

Mr. Arthur S. Flower said he had hoped that the lecturer would have told them a little more about the intervals between supports in the case of segmental bays, because blunders were so often made about that. He also wished that more had been said about rectangular corner bays; for his part, he wished they had been prohibited by the Building Act. He would also like to know what the lecturer had to say about the modern practice of running a buttress into the middle of an oriel. He did not think there was much of that done in old work, and he supposed it was easier to build an oriel in that way; but he should like to know something about the morality of it. It was an excellent idea to discuss the rights and wrongs of a particular feature in architecture. As to the provision of a plinth to a bay, it was a question which often came up: whether the plinth, or, to use an older word, the ground table, should run right round a bay or not. He preferred to have it run right round, but there was often an idea that both the projection and proportion of the ground table should be regulated by the thickness of the wall. He wanted to call Mr. Waterhouse's attention to the pronunciation of "soffit." Why was it printed "soffit" and pronounced, as if a French word, "soffite"?

Mr. H. A. Satchell said that a redeeming feature of a builder's bay seemed to be the chance it afforded to the occupants of a change of prospect and aspect. It was a great advantage in a house facing, say, due south, to be able to have an outlook east and west. He would rather live in a plain house with a bay than a very handsome one without a bay. He had been, with an eminent member of the Institute, responsible for perpetrating one of those so-called enormities, an angle bay, and in the opinion of the inmates it was the feature of the house, and he ventured to think that any one who saw it would agree with that view.

The Chairman said he agreed to a large extent with the last speaker about the advantage of the bay window in houses facing south. The advantage of a bay, especially in London, was that the occupants might get a glimpse of sunshine, and that was an enormous advantage in this dull climate of ours. Mr. Stokes had advised them never to use an angle window, but he (the speaker) did not agree with that. In an angle bay three sides of the ground could be viewed, and with an octagon bay at an angle a very pleasant prospect could be obtained. He rather regretted that Mr. Waterhouse had not shown some illustrations of foreign oriels, for there were some very pretty ones to be seen in Spain and Nuremberg and elsewhere; while in Scotland there was quite a characteristic and original feature of architecture, viz., the Scottish oriel, which was there treated as it was nowhere else. With regard to what Mr. Waterhouse had called the bastard octagon, he knew of numerous examples in Tudor work where the treatment was very successful. The well-known gatehouse Thornton Abbey, Lincolnshire, and many collegiate windows were so treated. They were highly satisfactory, and the roofs worked out quite well. As regards the much-abused bay in the London villa, he thought it was of value to the occupant, for it gave him more sunlight, and he was able to see a great deal more than if he lived in a house without a bay. It had been badly employed in many ways by the jerry-builder, and the repetitions that Mr. Stokes had referred to were, of course, monotonous but he doubted if such repetitions resulted in more monotonous houses than those in Gower-street, for instance. In reference to Mr. Blashill's "gentleman of great culture," who thought that there was no such thing as proportion in architecture, surely there could be no more dangerous heresy; architecture was proportion; and good proportion in building was essential to good architecture. Although the laws of proportion, except, perhaps, in Classical work, could not be written down by exact rule, yet they were still laws, which appealed to every man who was acknowledged in art and they could not be transgressed without disastrous effect.

The vote of thanks was then heartily agreed to.

Mr. Waterhouse, in reply, said he agreed with Mr. Stokes that the 45 deg. set square was often a snare to architects and led them into many indiscretions. For want of time he had not read the whole of his paper, and one or two points referred to by Mr. Flower and others would be found in the printed report. As to Mr. Flower's question about the buttress system of supporting an oriel, his answer was that he did approve of it; and as to the question of pronunciation, he pronounced the word "soffit," as he found other people pronounced it, thinking that in the matter of pronunciation common use was the best law.

The Chairman announced that the next meeting would be held on December 9, when Mr. Edwin T. Hall will read a paper entitled "The Position of Architecture among the Arts."

The meeting then terminated.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Mr. T. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Vestry of St. George, Hanover-square, £2,500. for purchase of land and erection of a depot; and the Vestry of St. George-the-Martyr, Southwark, £1,235. for the erection of workshops and stores, and for sewage and paving works.

**Chief Officer of Tramways.**—The General Purposes Committee reported that they had received seventy applications for the post of chief of the Council's tramway department. They recommended, and it was agreed, that Mr. John Young, manager of the Glasgow Corporation Tramways, should be appointed at a salary of £1,500. a year.

**Flash Lights in the Streets.**—Upon the reception of the report of the Public Control Committee,

Mr. Alfred Smith asked whether the Committee had had their attention called to the danger of flash light advertisements in the streets; whether it was a fact that they



frightened horses and increased the danger to pedestrians, and whether the Committee could see its way to frame some regulations dealing with the nuisance.

Mr. Crooks, Chairman of the Committee, said that individually the members of the Committee had noticed the flash lights, but the Council had no power to touch them. The Committee would, however, carefully consider the matter, and give it their best attention.

Sir Harry Poland observed that the question was now before a Sub-committee of the Local Government and Taxation Committee.

**The Smoke Nuisance.**—The Public Control Committee reported the steps they were taking with a view to the enforcement of the provisions as to smoke prevention contained in the Public Health (London) Act, 1891. The Council was aware of the extreme difficulty of dealing with cases where it could only act when default had been proved against the sanitary authority, but so far as the present state of the law allowed they were putting into force the Council's power to the fullest extent possible. They further stated that, in accordance with the Council's instructions, they were considering in what way it was desirable to amend the law so as to more effectually grapple with the grave nuisance from smoke which still existed to a serious extent in London.

**Conveniences, Blackwall Tunnel.**—The Bridges Committee recommended, and it was agreed, that the Council should sanction an expenditure of 1,891l. 15s. 7d. for the construction of conveniences at the northern entrance to the Blackwall Tunnel, and that the tender of Messrs. Doulton & Co. be accepted for the work.

**Abbey Mansions, Westminster.**—The Building Act Committee reported as follows, the recommendation being agreed to—

"The Council will remember that in April last a fatal accident took place at Abbey Mansions, south block. It appears that while the building in question was being erected, the Commissioners of Her Majesty's Works entered into a conditional agreement with a Mr. Pawley for leasing the building, one of the conditions being that the occupation of the Government was not to take effect until, in the opinion of the officers of the Commissioners, the premises were fit for occupation. At a later date the District Surveyor discovered that the height of the building was being increased beyond 80 ft. allowed by Section 47 of the London Building Act, 1894; but upon representing this to the builder, he was told that the agreement referred to vested the property in the Government, and that it was consequently exempt, under Section 202, from the operation of the Act. This Section states that any building or structure erected in and in the occupation of a Government department for public purposes, shall be exempted from so much of the provisions of the Act as relates to buildings and structures. The same course had been followed in the erection of the adjoining north block, in respect of which a similar agreement had been entered into by the Commissioners of Her Majesty's Works. The District Surveyor having satisfied himself as to the existence of the agreements, ceased to survey the buildings. On April 21 the south block collapsed, causing the death of seven workmen. On July 5 summonses taken out on behalf of the Council in respect of the buildings were heard at Westminster police-court, two of them being dangerous structure summonses, the others being summonses taken out by the District Surveyor (a) for improper construction of a story in the roof, such story being more than 60 ft. above the street level and not constructed throughout of fire-resisting material, and (b) for excessive height, the building being over 80 ft. high. The magistrate who heard the case took the view that the buildings came within the exemption specified in section 202 of the London Building Act, 1894, as being vested in and in the occupation of a Government department. The summonses were consequently dismissed, the magistrate, however, expressing his willingness to state a case. Letters were subsequently received by the Council from the Office of Works, stating that neither the Crown nor any Government department was in any sense in occupation of the premises, and that, in the opinion of the Commissioners, the buildings were not exempt from the operation of the Act. The Commissioners have, we understand, since repudiated the conditional agreements which they entered into with Mr. Pawley, their surveyor having declined to certify the premises as fit for occupation. In September last proceedings were taken by the Council under the Dangerous Structures Clauses of the London Building Act, 1894, and the Amendment Act, 1898, in respect of the north block of buildings, the angle turret at the corner of Victoria and Orchard-streets being reported to be in a dangerous condition, and the owner having declined to carry out the works specified in the notice served on him by the Council. The Council's position was somewhat complicated owing to the magistrate's decision that the buildings were

vested in and in the occupation of a Government department, but, on the suggestion of the magistrate, the question of the works to be carried out for the safety of the public was referred to arbitration. The effect of the arbitrator's award thoroughly justified the action taken by the Council, and the works have now been done. With regard to the magistrate's decision as to the exemption of these buildings from the provisions of the London Building Act, 1894, we think it is a case in which the Council should appeal, as there appears to be considerable doubt whether the words, "vested in and in the occupation of," in Section 202, bear the interpretation placed upon them; and it is desirable, for future guidance, to obtain an authoritative decision as to where the responsibility rests in such cases. The magistrate has accordingly at our request stated a case for the opinion of the High Court upon the question raised. We recommend—that the Solicitor do take the necessary steps for obtaining the decision of the High Court upon the case stated by the magistrate with reference to the question whether Abbey Mansions, Westminster, could be built as exempt from the provisions of the London Building Act, 1894, under Section 202 of that Act, by reason of the conditional agreements made between Mr. Pawley and the Commissioners of Her Majesty's Works."

**Tramways.**—The Highways Committee recommended, and it was agreed, that the undertaking of the London Tramways Company, after it shall have been transferred to the Council, be designated the "London County Council Tramways."

**The Housing Problem.**—The Housing of the Working Classes Committee presented a report containing a series of proposals for the general conduct of the Council in regard to housing.

The first recommendation was "That housing accommodation should be provided for a number of persons equal to that of the working classes displaced by any scheme under the Housing of the Working Classes Act, 1890, or under the provisions of any Improvement Act, but not necessarily in the immediate neighbourhood of the displacement, due consideration being given to the needs of those living on any particular area."

Mr. Bruce, Chairman of the Committee, in moving the adoption of the report, pointed out the enormous waste of human life which resulted from the crowding of tens of thousands of people, four, five, six, seven, and even eight into a room. The great difficulty of building by the public authority was the cost. The Council, unlike a private builder, had to consider not only the comfort and convenience of the persons to be housed, but the requirements of the medical officer of health. The medical officer required that there should be thorough ventilation in one and two-roomed tenements, and this greatly reduced the number of rooms which could be placed on an area.

Sir A. Arnold moved an amendment to refer back the proposal. He protested against "tying the Council's hands for ever," as this recommendation would do, and said that when the working man used the underground railway and had the services of 8,000,000l. for a penny, he sometimes forgot his indebtedness to capital.

Sir John Hutton thought the Housing Committee might more properly be described as the "Eviction Committee." The prolific and pregnant cause of the costliness of housing the working classes was the fact that less labour was given by the workman for his money than he used to give.

On a division, the amendment to refer back was lost by 92 votes to 16.

Lord Onslow moved, as a further amendment—"That, before adopting the recommendation, the Council desires to have from the Housing Committee a definition of those who should be included in the term 'working classes.'" He contended that while in London they had found dwellings for all those classes earning high rates of wages, they had not found dwellings for those who were really the necessitous poor. Liverpool and Hornsey had succeeded in doing this, and he asked why the Council should adhere to this very expensive and very luxurious style of dwellings when they were utterly failing to accomplish the object which Parliament had set before them.

Mr. Bruce pointed out that the Act of Parliament said the Council must house as many persons as they displaced, but it did not provide that the same persons were to be housed.

The amendment was negatived by 71 to 31 votes.

Mr. Crooks moved to add to the recommendation the words, "That a register be kept of all persons displaced, and, if possible, such

persons should have the first refusal of tenancy."

The addition was agreed to, and the first recommendation, as amended, became the finding of the Council.

The second recommendation, that all clearances involving re-housing should be done at the sole cost of the Council, was also adopted, and the consideration of the third recommendation, with regard to the purchase of land under Part III. of the Housing Act, was postponed.

**Holborn to the Strand.**—On the recommendation of the Improvements Committee the following was agreed to:—

"That the Parliamentary Committee be instructed to make provision in the Improvements Bill for the next session of Parliament for the acquisition, in connexion with the rehousing of persons to be displaced by the formation of the new street from Holborn to the Strand, of land (1) in St. Pancras, bounded on the east and north-east by Pakenham-street, on the west by Arthur-street, and on the south by Wells-street, comprising the premises occupied by the London Improved Cab Company; (2) in Holborn, bounded on the north by Holworthy-square, on the south and east by Little Gray's Inn-lane, and on the west by Gray's Inn-road, comprising the premises of the Holborn Union workhouse; and (3) in Lambeth, on the north side of Palmer-street, between Cornwall-road and St. Andrew's Church, and on the east side of Cornwall-road, between Palmer-street and the passage known as Peer's-coopage."

**Additions, Mayford Industrial School.**—The Industrial and Reformatory School Committee recommended:—

(a) That an expenditure not exceeding 500l. be sanctioned for the construction of a manual instruction room at Mayford Industrial School.

(b) That an expenditure not exceeding 500l. be sanctioned for the construction of a swimming bath at Mayford Industrial School.

(c) That the Industrial and Reformatory Schools Committee be authorised to issue advertisements inviting tenders for the execution of the work.

The recommendations were agreed to.

**Discharges in Sewers.**—In concluding their report on an explosion in the filth-hoist over the northern low-level sewer at the Abbey Mills Pumping Station, the Main Drainage Committee recommended:—

(a) That the Council do make an order under Section 10 of the Council's General Powers Act, 1894, prohibiting the discharge into sewers of dangerous substances from premises where the process of distilling or re-distilling petroleum is carried on, and that the solicitor and chief officer of the Public Control Department be instructed to prepare such order.

(b) That the chief officer of the Public Control Department be instructed to serve a copy of such order upon any person or persons carrying on the process so as to make it probable that refuse is discharged from the stills into the sewers.

The recommendations were agreed to, and the Council shortly afterwards adjourned.

#### ARCHITECTURAL SOCIETIES.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—At a meeting of this Association, held in the rooms, 187, Pitt-street, Mr. George S. Hill in the chair, a paper was read by Mr. Hunter Crawford, Edinburgh, entitled "Domestic Steam Heating and Hot Water Supply." Mr. Crawford pointed out and discussed the differences between heating by steam and heating by hot water. The extreme dryness of air caused by steam heating rendered it unhealthy except where a good circulation of air could be obtained, as in a hall or staircase. The rapidity with which the heat in a room could be raised by the steam was certainly one of the advantages possessed by the steam system over the hot-water system. The fact that water could be heated by steam to near boiling point rendered this system of great use for domestic purposes in the kitchen, and in the washing-house, &c. Mr. Crawford illustrated his paper by a model, glass tubes being used in the place of iron piping, so that by means of coloured water the flow in the pipes was clearly indicated. The lecturer, by means of the model, showed the several points which had to be borne in mind when putting in such an installation as was shown by the model, which showed a section of a house with radiators fitted into the different rooms, washing-house, boiler, &c., connected to a steam generator in the basement. Mr. McGibbon, in moving a vote of thanks to the lecturer, which was heartily adopted referred to the pleasure the



Association had in receiving him as a delegate from the Edinburgh Architectural Association.

MID-LANARK ASSOCIATION OF ARCHITECTS.—The first annual general meeting of this Association has just been held in Hamilton. The secretary's and treasurer's reports for the year showed that the Association had supplied a want—the wonder being that it had not been formed sooner. The Association had already been of considerable service to the profession in the district. The officials and council for the ensuing year were unanimously re-elected as follows:—President, ex-Provost Arthur, Airdrie; Vice-President, Mr. Cullen, Motherwell; Bailie Davidson, Coatbridge; Mr. Harvey, Bellshill; Mr. Paterson, Hamilton; and Mr. Ross, Wishaw, ordinary members; and Mr. Miller, solicitor, Motherwell, secretary and treasurer.

LEEDS ARCHITECTURAL SOCIETY.—"A Cruise in the Eastern Mediterranean" was the title of an address given on the 28th ult. by Mr. John Tweedale before the members of the Leeds and Yorkshire Architectural Society at the Society's rooms, Park-street, Leeds. The lecture, which was illustrated with lantern slides, dealt with life and scenery in Greece, Palestine, and Egypt. The chair was occupied by Mr. George Corson.

### Illustrations.

#### SCULPTURE PANELS.

THE panels in relief here illustrated have been executed at different times by Miss E. M. Rope; all of them having the quality in common that they are designed as decorative sculpture to fill panels in walls.

The panel for the Rotherhithe Town Hall was designed to fill a space of 20ft. in length below the front of the gallery in the Council Chamber. It is framed by oak panelling above and below. Unfortunately three large windows face the panel, making the effect of shadow in low relief almost impossible. The panel is therefore toned strongly with raw umber and wax rubbed in, and this not only has the effect of bringing out the relief, but agrees well in tone with the surrounding oak. The sculptor went down to the docks to get sketches of the timber loading, &c., and worked on the plaster from a scaffolding for a week or more after the panel was in position, in order to fight for effect under the unfavourable conditions of lighting. The Vestry arms are coloured heraldically, but not by the artist.

The "Sea Chariot" circular panel was designed for an over-mantel. It was exhibited at the New Gallery in plaster, and at the Paris Salon in bronze, under the title "Au fond de la Mer."

The long panel for an over-mantel, representing children playing and swinging, illustrates the lines—

"Antic sport and blue-eyed pleasure  
Frisking light in frolic measure";

words which were thus translated in a notice of the Royal Academy in the *Montieur des Arts* :—

"Le Sport Antique, et le plaisir d'yeux bleus,  
Eclairent la lumière dans des Saintes mesures."

This is one of the best specimens of French misinterpretation of English we have seen, and is worth preserving.

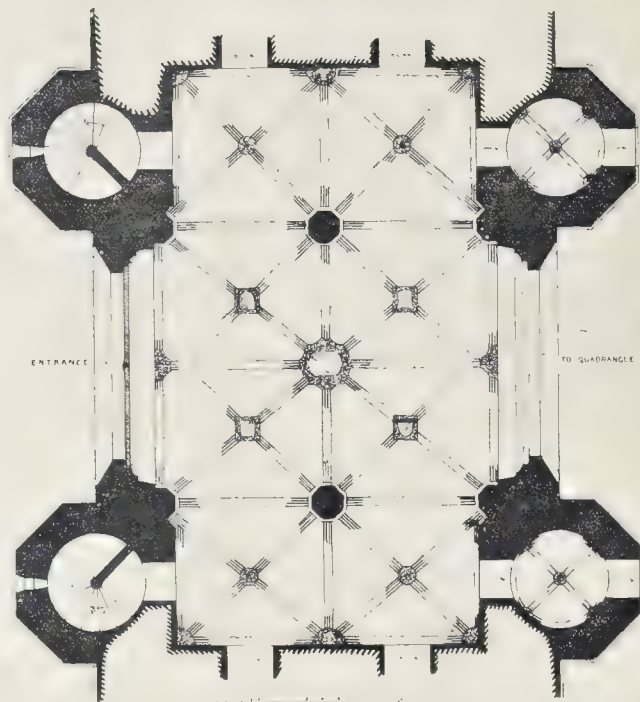
The other two panels are also for over-mantels; the one representing four children dancing is really a portrait group studied from the children.

These panels for over-mantels were purposely designed to be executed at a low cost and repeated if desired, so that they could be used by others than the very rich. The "Sea-Chase" panel, for instance, has been used in the gymnasium of the High School at Ipswich. The portrait relief of children was a commission; the four children appear twice, in order to give another view of the faces and to lengthen the relief.

#### PREMISES, BROMLEY.

THE shop and bank have been built from my drawings and instructions. The base of the building is of grey unpolished granite; the bank windows are of gun metal, the walls of red brick, with red tile roofs.

The upper part of the bay windows is covered with cast lead with a cast pattern painted and gilded. The gutters are also of cast lead, with



Design for a Gateway Tower. Plan.

patterns. The shop front is of teak, as are also the doors of the bank.

The work generally has been carried out by Mr. F. P. Duthoit, of Bromley. The cast lead-work and gun metal sashes, as also the lead glazing, were done by Messrs. Wenham & Waters; the electric work by Messrs. Price & Cornille, and Messrs. Bishop & Co., of Croydon; the gates by Messrs. Elsley & Co.; the heating apparatus, &c., by Messrs. Longden & Co.; the strong-room work by Messrs. Chubb; and the fittings by Messrs. Sage & Co.

I am only responsible for the sketch of the "Bell Hotel," adjoining, as shown by the drawing you publish; Mr. Saunders (Messrs. Reid & Co.'s architect) kindly allowing me to collaborate with him to this extent. The building of the "Bell" was carried out entirely by him, and as built shows many features which are absent from the original sketch and to which I can lay no claim.

ERNEST NEWTON.

#### INTERIOR OF ST. MARY'S CHURCH, MANSFIELD.

THIS drawing of the interior of a church, of which Mr. Temple Moore is the architect, was exhibited at the Royal Academy this year, and was commented on in our notice of the Academy drawings at the time.

Owing to the architect being out of town, we are unable to give any detailed information about the building, and must leave the drawing to speak for itself.

#### DESIGN FOR A GATEWAY TOWER.

THIS is a Royal Academy School design. The subject was set by Mr. T. G. Jackson, R.A., and the design here published, by Mr. G. J. J. Lacy, gained the 25th premium in the Upper School of the R.A. Mr. Jackson's instructions were that the gateway was to be groined, and place to be found for a statue above the entrance. The upper part was to contain a living room, well lighted. On each side of the tower was to be a lower building, 24 ft. from ground to wall plate, with two stories of rooms and an attic; all to harmonise in style. The height of the tower not to exceed 70 ft.

#### PROPOSED CHURCH OF ST. COLUMB LANCASTER ROAD, W.

ST. COLUMB'S, Lancaster-road, has been planned to accommodate a congregation entirely in the nave, with a processional aisle encompassing the whole church; a distinct baptistry being provided on one side. The choir and sanctuary are shown to be unusually large. On either side are low galleries for the organ and orchestra. The vestry and choir school are beneath the sanctuary.

The treatment is simple and broad, of brick, stone, and plaster; the barrel roof having iron principals. Internally the lower part of this is to have modelled plaster decorations, coloured. Externally the treatment is in brick.

The architect is Mr. W. A. Pite. The drawing of the interior was exhibited at the Royal Academy, 1897.

#### COMPETITIONS.

SCHOOL, BALA, MERIONETH.—In the open competition for designs for the New County Intermediate School at Bala, the plans submitted by Mr. H. Teather, of Shrewsbury, have been placed first by the assessor, and he has been appointed to carry out the work.

SCHOOL, WRENHAM.—At a recent meeting of the managers of the County school, the Clerk (Mr. W. R. Evans) reported that seventeen sets of drawings had been received in the competition for a new school building, and the assessor had made his awards as follows:—First, "Light" (Mr. John Henry Phillips, Cardiff); second, "Kelt" (Mr. H. Teather, Shrewsbury); honourable mention, "Intermediate" (Messrs. Wilson & Moxham, Swansea); "Inigo Jones" (Mr. Frank Bellis, Bagnor). The first design would, in his opinion, cost 10,179l., the second 10,255l., the third 11,668l., and the fourth 13,070l.

FEVER HOSPITAL, ARDROSSAN.—We have received a letter from a competitor complaining that the plans in this competition have been lodged about six weeks ago, and nothing has been heard of the decision yet.

PUBLIC OFFICES AND DEPOT, YARDLEY.—In the limited competition for the new public offices





PLASTER PANEL 20 ft. LONG IN COUNCIL CHAMBER, ROTHERHITHE TOWN HALL. "DOCKS AND TIMBER TRADE IN THE THAMES IN THE YEAR 1700" VESTRY ARMS IN CENTRE



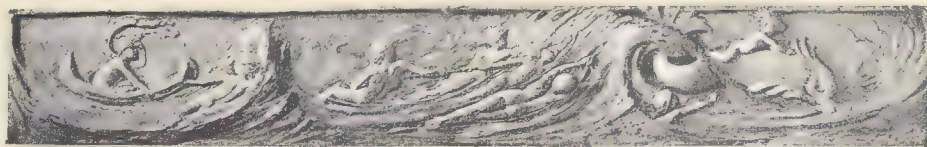
A SEA-CHARIOT. (EXHIBITED AT THE SALON IN BRONZE, 1897; ROYAL ACADEMY, 1898.)



DESIGN FOR OVER-MANTEL. (ROYAL ACADEMY, 1898.)



PORTRAIT RELIEF OF FOUR CHILDREN. (NEW GALLERY 1898.)



A SEA-CHASE, DESIGN FOR OVER-MANTEL. (ROYAL ACADEMY, 1897.)







Ernest Newton Architect

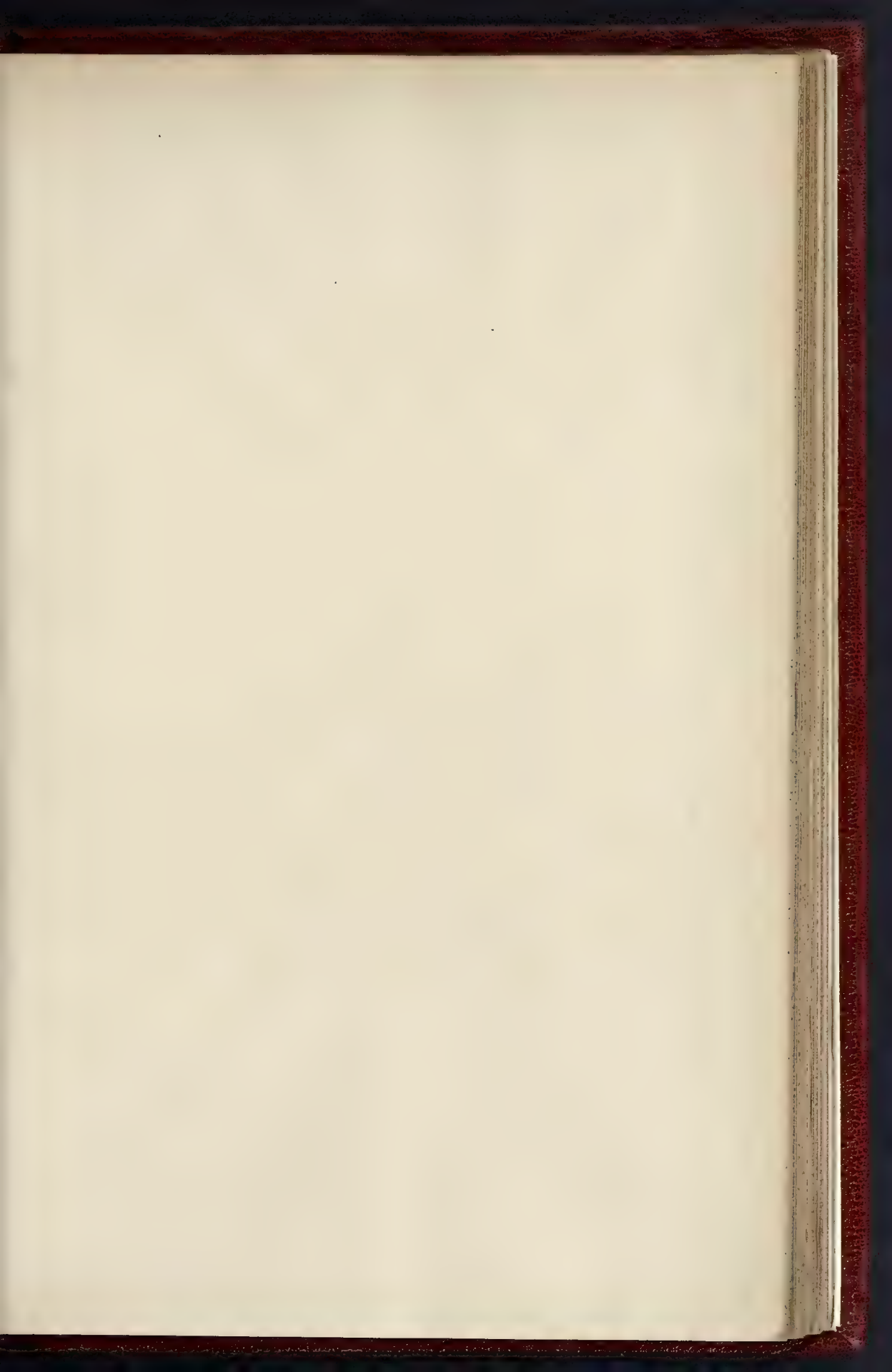
115

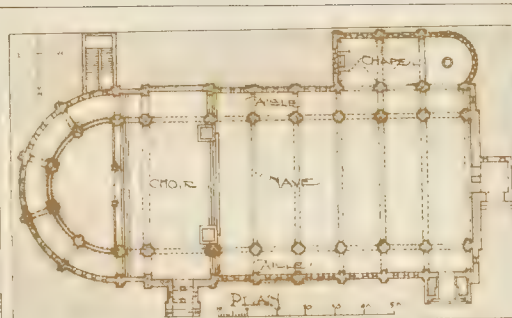
PHOTOGRAPH BY J. H. & S. EAST HARDING STREET FETTER LANE E.C.

BUILDINGS AT BROMLEY, KENT—MR. ERNEST NEWTON, ARCHITECT

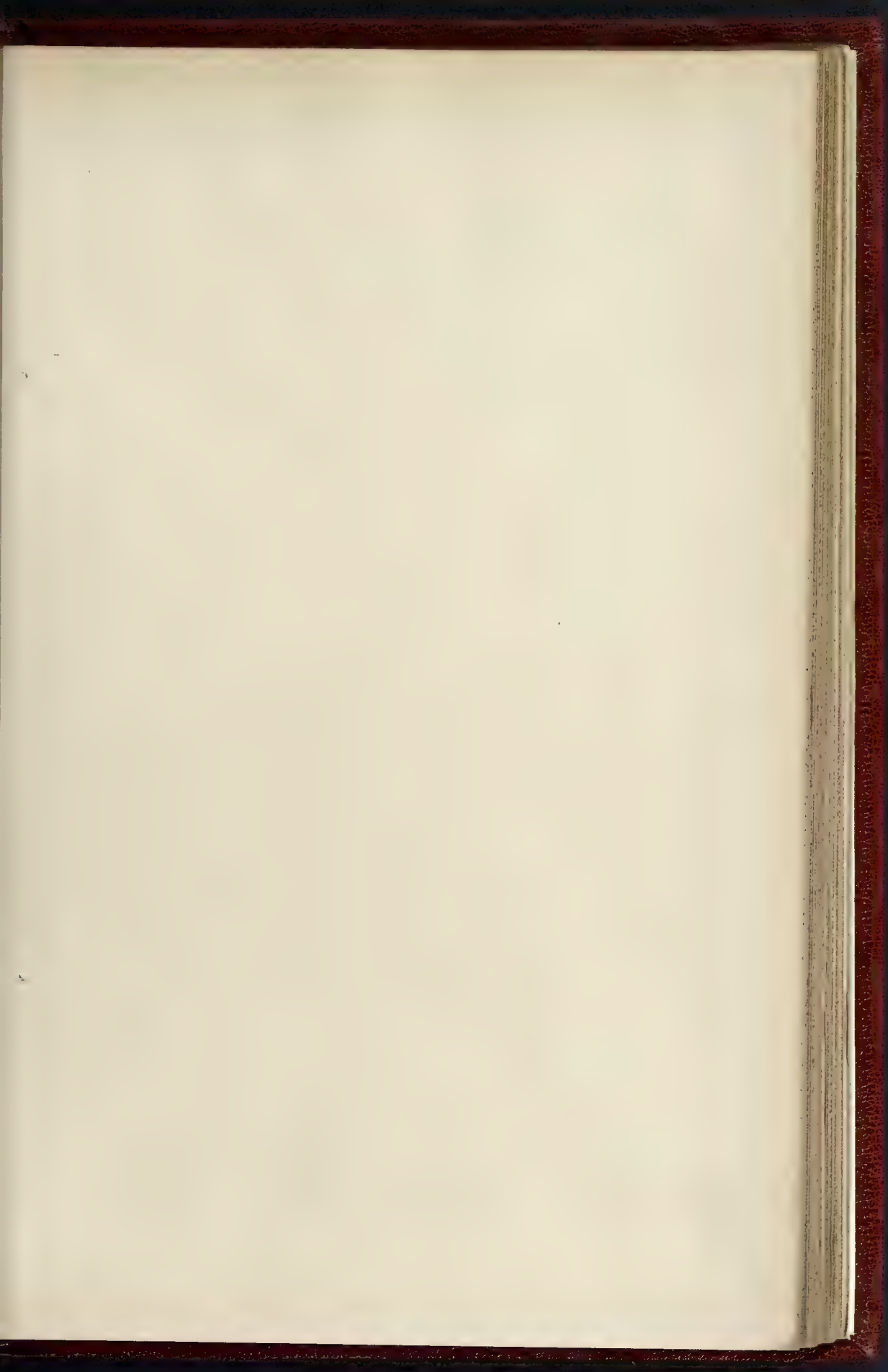




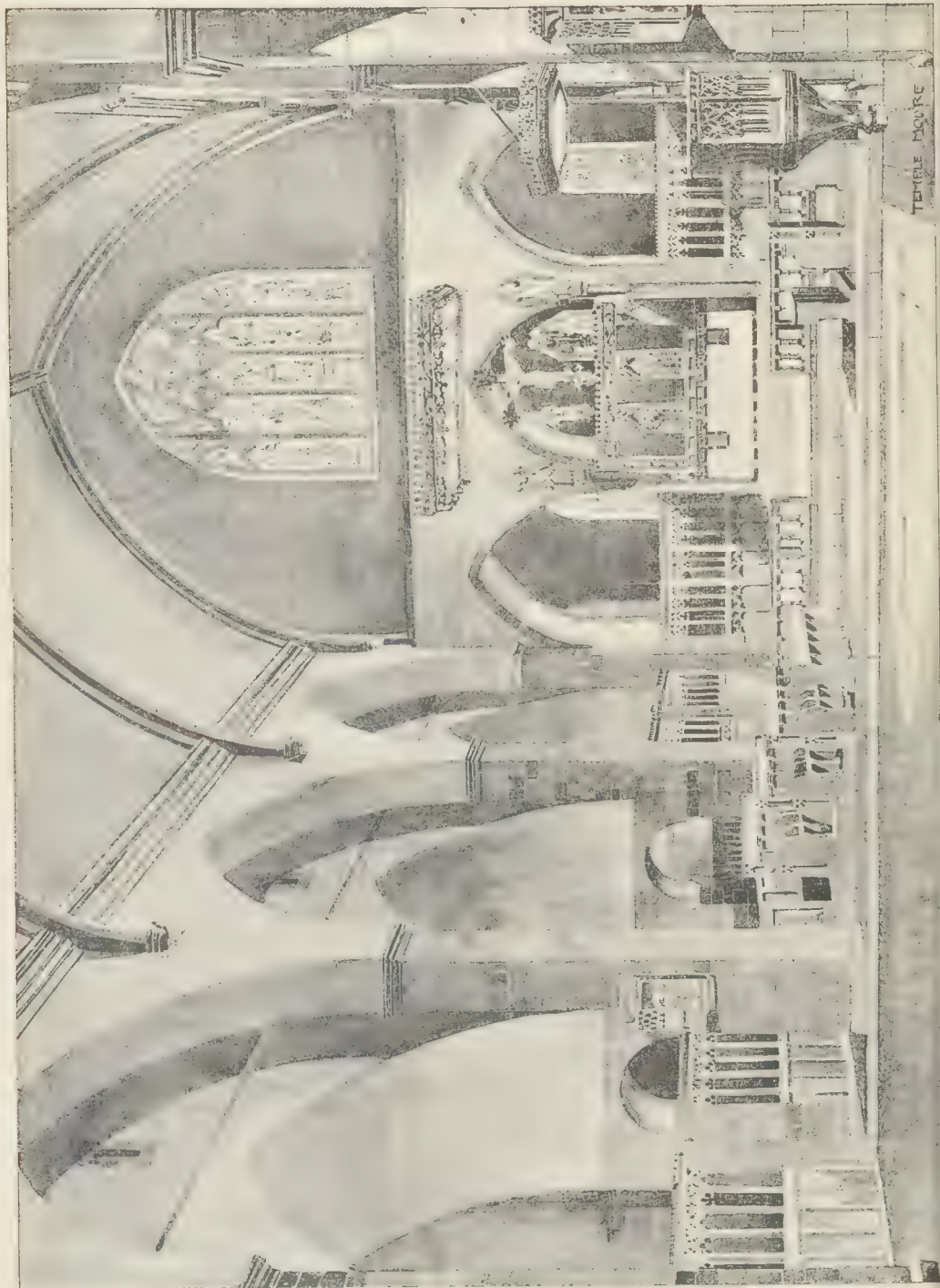








THE BUILDER, DECEMBER 3, 1898

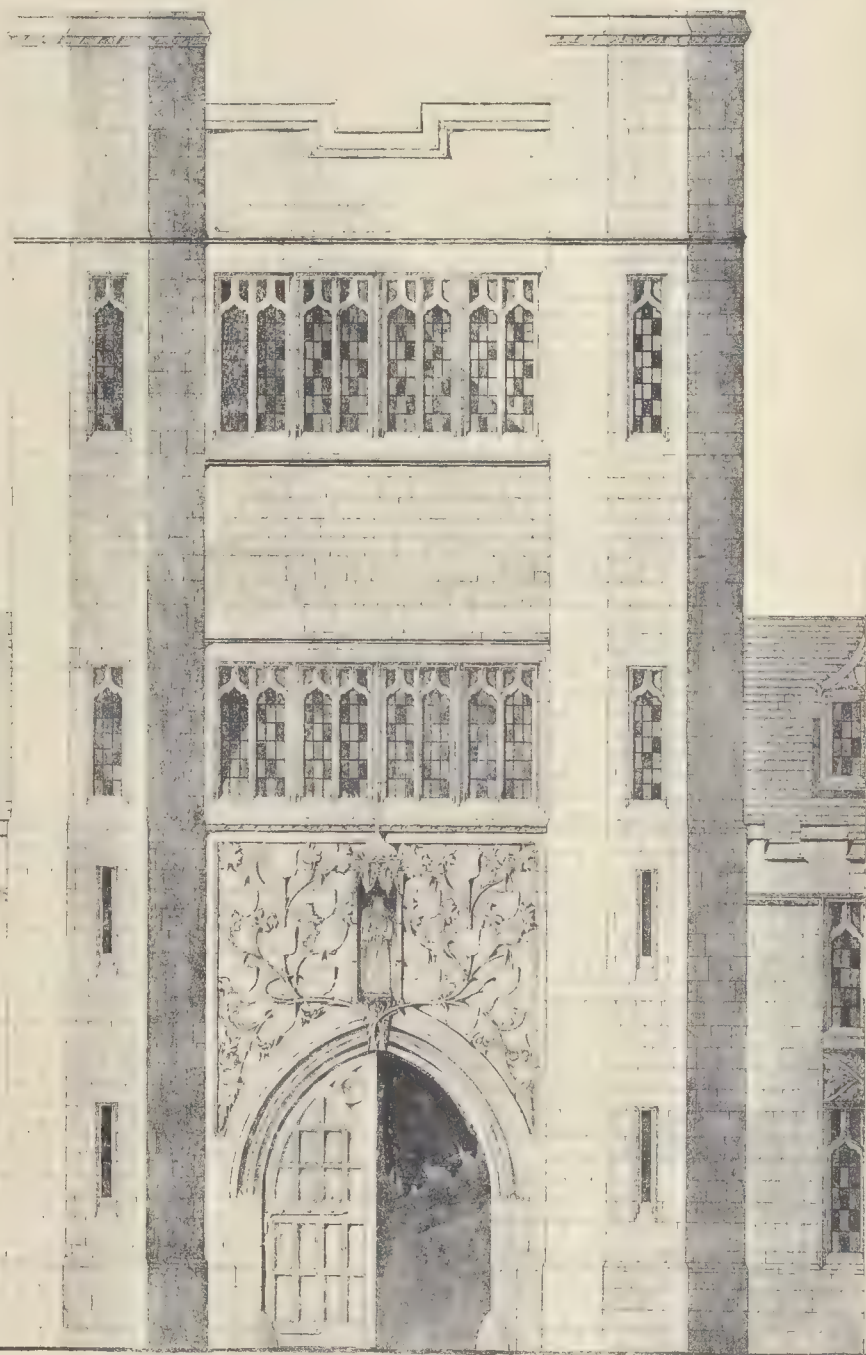


TEMPLE MOORE



## DESIGN FOR A GATEWAY TOWER leading to a COLLEGE QUADRANGLES

By Mr G. J. J. Lacy



Cont. Experiments











depot, fire-station, and mortuary to be erected in Stratford-road, Sparkhill, Birmingham, the assessor, Mr. W. Martin, has awarded the first premium to Mr. A. Harrison, 88, Colmore-row, Birmingham, the second and third premiums being equally divided between Mr. J. R. Nichols, 55, and 61, Colmore-row, Birmingham, and Messrs. Ingall & Son, 3, Temple-row, Birmingham.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the London Building Act, 1894. Those applications to which consent has been given are granted on certain conditions.\*

##### *Dwelling House and Shop at less than the prescribed distance.*

(a) That the resolution of the Council of February 11, 1898, with regard to the application of Mr. W. Stewart on behalf of Mr. C. Craze be rescinded. (b) That consent be not given to the erection of a dwelling-house, with shop, on the north side of Watney-passage, at the rear of No. 52, Watney-street, the ground story portion of the building to abut also upon Winterton-street, at less than the prescribed distance from the centre of the street.—Agreed.

##### *Lines of Frontage.*

**Hackney, North.**—Stabling to abut upon the east side of Upper Clapton-road and the west side of Cassinier-terrace, Hackney (Mr. R. L. Adamson for the North Metropolitan Tramways Company).—Consent.

**Clapham.**—That the application of Messrs. Lee & Pain on behalf of Sir J. P. Dickson-Poynder, Bart., M.P., for an extension of the periods within which the erection of houses on the south side of Poynder's-road, Clapham Park, Clapham, on part of the grounds of Bygrove House, was required to be commenced and completed, be granted, upon condition that the houses referred to be commenced within two years and a half and completed within three years and a half from July 26, 1897.—Agreed.

**Deptford.**—Two one-story shops on part of the forecourt of No. 133, High-street, Deptford (Mr. J. Webster for Mr. A. B. Luck).—Consent.

**Dulwich.**—Four one-story shops on the western side of Dog-kennel Hill, East Dulwich, adjoining "the Dulwich railway station (Messrs. Barlow & Roberts).—Consent.

**Halborn.**—A porch at the entrance to the Italian Hospital, on the south side of Queen-square, Bloomsbury (Mr. T. W. Cutler for Comandatore J. Ortelli).—Consent.

**Kensington, North.**—An iron and glass porch in front of No. 79, Ladbrooke-road, Grosse, Notting Hill (Messrs. Traies & Son, Limited, for Mr. J. Ward).—Consent.

**Clapham.**—That the consent of the Council, granted November 1, 1898, to the construction and erection of a wood and glass porch in front of "Westview," Thurlough-road, Balham (Mr. E. W. Storey) be not modified by the omission of the words "that the whole of the woodwork of the porch be executed in oak, teak or other hard wood to the satisfaction of the District Surveyor" in the aforesaid consent.—Agreed.

**Hackney, South.**—A carriage-shed erected in a yard at the rear of No. 127, Victoria Park-road, and abutting on St. Thomas's-road (Messrs. Meakin & Archer for Mr. B. Applestone).—Refused.

**Lewisham.**—A house on the south side of Ladywell-road, at the corner of Phoebe-street, Lewisham (Mr. H. H. Bridgman for Messrs. R. & F. Slater).—Refused.

**Marlybone, West.**—A one-story addition to the bath-room of No. 27, Grove-road, St. Marylebone (Messrs. Vesty for St. Marylebone).—Refused.

**Marlybone, West.**—An iron and glass covered way at the entrance to the West London Theatre, Church-street, Marlybone (Mr. W. Hancock for Mr. W. Bailey).—Refused.

**Strand.**—Two three-story oriel windows in front of Nos. 11 and 33, Haymarket, St. Martin-in-the-Fields (Mr. J. Smith for Messrs. J. Brecknell & Turner, Limited).—Refused.

##### *Width of Way.*

**Fulham.**—A one-story modelling-room and a bath-rooms, in the girls' and infants' playground of the schools in William-street, at the corner of Portland-street, Fulham (Mr. T. J. Bailey for the School Board for London).—Consent.

**Rotherhithe.**—A grain-pit erected at Trinity Wharf, Rotherhithe-street, at less than the prescribed distance from the centre of the road (the British Drying Company, Limited).—Consent.

**Lambeth, North.**—Workshops on the east side of Belvedere-road, between Vine-street and Belvedere-crescent (Mr. M. L. Saunders for Messrs. J. Smith & Co.).—Consent.

**Finsbury, East.**—That Mr. J. Groom be informed that the Council is not prepared to accede to his

request for the Council's consent to the retention of a new building in course of erection on a site abutting upon Basterfield-street (formerly French Alley), and New-street (formerly Back Alley), Golden-lane, St. Luke's, at less than the prescribed distance from the centre of each of those streets.—Agreed.

**Newington, West.**—A building upon the site of Nos. 224, 226, and 228, Tabard-street, Newington (Messrs. Dewrance & Co.).—Refused.

##### *Line of Fronts and Width of Way.*

**Chelsea.**—Building on the south-west side of Park Walk, between Chapel-street and Winterton-place, and the widening of that place and a portion of Park Walk (Mr. C. W. Stephens for the Metropolitan Industrial Dwellings Co., Limited).—Consent.

**Finsbury, Central.**—Rebuilding of the "Coach and Horses" public-house, No. 39, St. John's-square, Clerkenwell, with projecting angle turrets, &c. (Mr. A. Dixon for Whitbread & Co., Limited).—Consent.

**Paddington, South.**—A bay window in front of No. 1, Marlborough-gate, Bayswater-road, Paddington, at the corner of Elms-mews (Mr. W. W. Gwyther for the National Provincial Bank of England).—Consent.

**Dulwich.**—A house with bay windows on the north side of Piermont-road, Peckham-rye, to flank upon a footpath next Peckham Rye Park (Mr. W. Stair for Mr. C. W. Chessell).—Refused.

**Kensington, North.**—A building on the site of No. 97, Ladbrooke-road, Kensington, and part of the grounds belonging to that house, to abut upon Lansdowne-road and Boyne-terrace-mews (Mr. E. K. Purchase).—Refused.

**Westminster.**—A one-story addition at the rear of the "White Horse and Bower" public-house, No. 86, Horseferry-road, to abut upon Monk-street (Mr. H. W. Budd for the New Westminster Brewery Company, Limited).—Refused.

##### *Line of Fronts and Temporary Building.*

**Hampstead.**—That Mr. B. Beatty Kingston be informed that the Council is not prepared to accede to his request for the Council's consent to a structure unlawfully set up beyond the general line of buildings in Boundary-road, Hampstead, and without the Council's licence or approval as required by part VII. of the London Building Act, 1894.—Agreed.

##### *Width of Way and Temporary Building.*

**Whitechapel.**—Three temporary wood and iron school buildings, with water-closets and coal-shed, on the west side of Vallance-road, Whitechapel (Mr. T. J. Bailey for the School Board for London).—Consent.

##### *Formation of Streets.*

**Wandsworth.**—That an order be issued to Mr. W. C. Poole, sanctioning the formation or laying out of new streets, for carriage traffic, to lead out of Garratt-lane and Smallwood-road, Lower Tooting (for Mr. G. F. Darby). That the names Pevensey-road, Fairlight-road, Khartoum-road, Rostella-road, and Thurso-road be approved for the new streets.—Agreed.

**Woolwich.**—That an order be issued to Mr. J. O. Cook, refusing to sanction the formation or laying out for carriage traffic of a new street to lead out of the south side of Nightingale-place, Woolwich Common, and the widening of part of Nightingale-place (for Mr. W. Woodford).—Agreed.

**Slepey.**—That an order be issued to Mr. J. W. Stevens, refusing to sanction the formation or laying out, for foot traffic only, of new streets on the south side of Redman's-road, Mild End Old Town, and the widening of part of that road (for Mr. H. Hymans).—Agreed.

##### *Buildings on a Cleared Area.*

**Slepey.**—That Mr. J. W. Stevens be informed that the Council cannot consider his letter of October 19, 1898, on behalf of Mr. H. Hymans, as an application for a modification or relaxation of so much of the provisions of Section 41, and 43 of the London Building Act, 1894, as relates to the proposed erection of forty-six three-story workshops and two stables on the site of Nos. 10 to 36 (even numbers only) inclusive, Redman's-road, Mile End Old Town.—Agreed.

##### *Artisans' Dwellings not Abutting upon a Street.*

**Bermondsey.**—That the Council do make an order as follows:—Whereas Messrs. N. Joseph, Son, & Smith, of No. 45, Finsbury-pavement, London, on November 15, 1898, under the provisions of Section 42 of the London Building Act, 1894, delivered on behalf of the Guinness Trust, at the County Hall, a plan of an intended dwelling-house, to be inhabited by persons of the working class and proposed to be erected, not abutting upon a street, on a site at the rear of houses on the east side of Weston-street, Bermondsey. . . . And whereas the Council has taken the said plan, application, and particulars into consideration; now the Council, in the exercise of its powers under Section 42 of the said Act, but in no way otherwise than under such section, does by this order sanction the said plan.—Agreed.

##### *Cubical Extent.*

**Rotherhithe.**—The erection on the east side of Shad Thames, Horselydown, to abut at the rear on St.

Saviour's Dock, of a warehouse to exceed in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the trade of a rice merchant (Mr. G. W. Thompson, for Messrs. Carbutt & Co.).—Refused.

Recommendations marked † are contrary to the views of the Local Authority.

#### BOOKS RECEIVED.

THE ROMANO-BRITISH CITY OF SILCHESTER. By Frederick Davis, F.S.A. (W. Andrews & Co.)  
SANITARY ENGINEERING. By Colonel E. C. S. Moore, R.E. (B. T. Batsford.)

#### Correspondence.

##### *To the Editor of THE BUILDER.*

##### THE DURHAM GALILEE.

SIR,—Antiquaries and historians tell me that my theory as to the Galilee "will not wash." The legal expert tells me it is impossible, for no precedent can be found (!) in any historical record of two courts having been held in the same building; negative evidence with a vengeance!

Will some historian, antiquary, or legal expert, therefore, undertake to produce proper evidence to prove:—

1. That the recess containing now the altar of "Our Lady of Pity" was the work of any one but of Bishop Pudsey?

2. That it could have been constructed for any purpose other than for his throne of judicature, for any secular as well as for ecclesiastical causes—seeing that the back represents a mere curtain hanging, whilst on the return jambs are portrayed the living symbols of his two-fold authority, royal and episcopal, on either side?

3. That he could have had no possible valid reason for the erection of such a tribunal under the exceptional circumstances of his position?

4. That his recorded intentions of building it as a lady chapel were duly carried out?

5. That the miracle which is recorded, attesting to his intentions, and their fulfilment, really took place, and was not invented merely as a *ruse* to justify the carrying out of his altered scheme instead of a lady chapel.

6. That—supposing its truth—the miracle really supports his case; although there be nothing to show whether the spirits were embodied or disembodied; and why evil spirits instead of angels should have been employed to perform so excellent a work in indicating a more fitting site for the purpose?

Until these questions shall have been satisfactorily set at rest, I see no possible reason to recede one step from the position which I have taken up with respect to the Galilee, and it remains as a most remarkable testimony in favour of architectural evidence as against historical tradition and even so-called contemporary record.

WILLIAM WHITE, F.S.A.

##### THE SMOKE NUISANCE.

SIR,—In your "Note" on this subject, wherein reference is made to the possibility of burning anthracite coal, you state that "nearly all the grates and fireplaces as at present made would have to be removed to make way for metal capable of withstanding the great heat produced by anthracite." Will you permit us in fairness to this imperceptibly understood and much misrepresented fuel to inform you that, although we have supplied anthracite coal to a great many consumers in London who burn it in all sorts of stoves and grates, we have never yet had a complaint of any extra damage caused by its use? We shall be happy to show any representative of yours grates and stoves in which anthracite coal has been burnt for years, and a public example can at any time be seen in the waiting rooms at Paddington Station, where anthracite has been exclusively used for the last twelve years.

LONDON WARMING AND VENTILATING COMPANY, LIMITED.

##### NEW PULPIT, ST. PETER'S CHURCH,PLYMOUTH.

—On the 23rd ult. the memorial pulpit, erected as a testimonial to the vicar, the Rev. George Rundle Prynn, M.A., who has now been the head of St. Peter's Parish, Plymouth, for over fifty years, was dedicated. The architect, alike for the new church and the pulpit just dedicated, is Mr. George H. Fellowes-Prynn, the President of the Architectural Association, who is the son of the vicar. The new pulpit has been built up against one of the piers that support the north arcade. The metal work has been carried out by Messrs. Singer & Sons, of Frome, whilst the stone and marble portion was entrusted to Messrs. Harry Hems & Sons, of Exeter.

NEW CLOCK, WILSHAMSTEAD.—A large clock has been erected in the church at Wilshamstead, by Messrs. John Smith & Sons, of Derby. It has a 5 ft. dial facing eastwards, and strikes the hours.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.



## The Student's Column.

SOUND, LIGHT, AND HEAT.—XXII.

HEAT: PRELIMINARY.

**T**HAT part of the science of heat relating to the practical warming of buildings has formed the subject of a previous series of articles in this column; but there are many other aspects of this branch of physics remaining to be described. The term "heat" in a physical sense comprises not only the phenomena incident upon the production of the sensation of warmth and cold, but the method of action and effects generally of variations in temperature in solid, liquid, and gaseous bodies.

As is usual with many fundamental problems in physics, considerable difficulty is experienced in deciding the actual nature of heat, which clearly shows how little, as yet, the subject is understood. Two theories as to the cause of heat have been suggested, the theory of "emission" and the theory of "undulation." These as explained in Ganot (p. 278) may be summarised as follows:—On the emission theory heat is caused by a subtle imponderable fluid, which surrounds the molecules of bodies, and which can pass from one body to another. These "heat atmospheres," which thus surround the molecules, exert a repelling influence on each other, in consequence of which heat acts in opposition to the force of cohesion. The entrance of this substance into our bodies produces the sensation of warmth, its egress the sensation of cold. On the second (undulation) hypothesis the heat of a body is caused by an extremely rapid oscillating or vibratory motion of its molecules; and the hottest bodies are those in which the vibrations have the greatest velocity, and the greatest amplitude.

At any given time the whole of the molecules of a body possess a sum of *vis viva*, which is the heat they contain. To increase their temperature is to increase their *vis viva*; to lower their temperature is to decrease that. Hence, if this view be correct, heat is not a substance but a condition of matter, and a condition which can be transferred from one body to another. When a heated body is placed in contact with a cooler one, the former cedes more molecular motion than it receives; but the loss of the former is the equivalent of the gain of the latter. It is also assumed, says Ganot, that there is an imponderable elastic ether, which pervades all matter and infinite space. A hot body sets this in rapid vibration, and the vibrations of this ether being communicated to material objects set them in more rapid vibration; that is, increase their temperature. The vast majority of authoritative physicists adopt the theory of undulation.

### Expansion by Heat.

The term "expansion" here covers contraction also. All bodies expand by the action of heat. In experimenting on this phenomenon, the body dealt with may be examined as to its linear expansion, its superficial expansion, or its cubical (volume) expansion. To prove linear expansion, take a metal rod and fix one end of it to an upright rigidly implanted on a stand; near the other end fix another upright, but do not attach the rod to it, merely allowing the latter to rest on it or pass it through a hole, so that the end of the rod has free play. Place any convenient object against that end of the rod, taking care to note its exact position on the stand. Now apply heat along the centre of the rod and watch the object placed against the free end. It will be noticed that the object is pushed along on the stand as the temperature in the rod rises until a certain limit is reached. Then let the temperature down by removing the heating apparatus, and it will be observed that the free end of the rod slowly goes back, leaving the object which stood against it behind on the stand. In other words, the pushing away of the object denoted expansion of the rod by heating, and its shrinkage back to its former position indicates contraction, whilst the distance to which the object has been pushed will give a measure of the actual expansion. This latter is commonly measured, in the experiment, by placing an index against the free end, which is moved, according to the amount of expansion, round a portion of a graduated dial.

Superficial expansion may be gauged in a somewhat similar manner, but two dimensions have to be taken, and the metal or other sub-

stance experimented with ought preferably to be of a tubular form. Cubical expansion may be demonstrated by what is known as Gravesande's ring. At the ordinary temperature a metal ball is made so that it may just be passed through this ring; but if the ball be heated it no longer does so, proving volumetrical expansion; and various apparatus have been devised for showing the expansion of liquids and gases.

Perhaps the most practical applications of this property of expansion, from an architectural standpoint, are in reference to materials of construction. A few statistics may be useful here. Sudden changes in temperature, such, for instance, as a variation of 40 deg. Fahr. in twenty-four hours, do much mischief in such substances as stone, causing cracks to appear in the masonry, and solid angles and edges to break off. The difficulty of obtaining permanently tight joints even with the strongest cements, led Colonel Totten\* to institute a series of experiments with a view to ascertain the actual expansion and contraction of granite, sandstone, and marble when subjected to ordinary temperatures. Upwards of thirty experiments on each of these varieties of stone showed the rate of expansion and contraction per inch—which seemed to be uniform throughout the range of temperature employed—to be for granite '000004825 in. for every degree Fahrenheit; for marble '000005668 in., and for sandstone '000009532 in. Supposing then, two coping stones each five feet long be laid in midsummer at a temperature of 96 deg. Fahr. In winter the temperature falls to zero, a change of 96 deg. If the stones contract towards their centres, the whole length of stone put in motion will be 5 ft. In the case of granite, then, the shrinkage amounts to '02792 in. in marble '03264 in., and in sandstone to '05404 in. This shrinkage, small as it seems, gives rise to cracks at the joints, which admit the passage of water; continual shrinkage and expansion must in time crumble the cement and leave the joint permanently open.

Other results arrived at by Adie† are, for rate of expansion of '0000438 in., and white marble '00000613 in.

In order to provide for the effects of expansion and contraction in the Clifton Suspension Bridge,‡ and also for the movement occasioned by wind and by the passage of heavy loads across the bridge, the two extremities of the roadway are furnished with jointed ends or flaps, 8 ft. long, which give freedom of motion both vertically, and in the direction of the length of the bridge. In the works referred to, some interesting results of investigation of the strains produced in an iron arch by contraction or expansion of the metal are given.

In reference to expansion in metals during the manufacturing process, Professors Bloxam and Huntingdon observe that, by hardening, steel is expanded from its original size when cold, the expansion being greater the higher the temperature to which the steel has been raised and the more quickly the cooling is effected. Notwithstanding this, a given piece of steel may be smaller after it has been hardened than it was before. This apparent anomaly is not difficult to explain. In pieces of steel above a certain size, the hardening does not extend right through to the centre. The surface, when it is suddenly cooled, contracts to a certain extent, and exerts a considerable compressive force on the metal in the interior, which, as it slowly cools, is forced to occupy a smaller volume than it did originally; whilst the hardened portion, which is in a state of tension owing to its having been cooled suddenly, occupies a greater. If, then, the contraction of the interior be greater than the expansion of the exterior, the piece of steel as a whole will be smaller after hardening than it was before, and *vice versa*. The whole question turns on the relation of the volume of the hardened portion to that which has been only partially hardened.

Molten cast-iron expands at the moment of becoming solid, and solidified bismuth occupies a larger space than bismuth in the liquid state.

The coefficient of linear expansion is the increase of the unit of length of a body when its temperature rises from zero to 1 deg.; the coefficient of superficial expansion is the in-

crease of the surface in being heated from zero to 1 deg.; and the coefficient of cubical expansion is the increase of the unit of volume under the same circumstances. These coefficients vary with different bodies, but for the same body the coefficient of cubical expansion is three times that of the linear expansion.\*

The practical applications of the expansion of solids are very numerous. The metal tyres of wheels are usually put on by heating the metal so that the hoop by expansion becomes larger than the wooden or other framework of the wheel. Then, on placing the heated hoop in position as a tyre, and allowing it to cool, contraction of the metal takes place to such an extent as to firmly grip the framework, and the tyre is completed. Ganot alludes to an interesting case of a gallery at the Conservatoire des Arts et Métiers, in Paris, the walls of which had begun to bulge outwards. Iron bars were passed across the building and screwed into plates on the outside of the walls. Each alternate bar was then heated by means of lamps, and when the bar had expanded it was screwed up. The bars being then allowed to cool, contracted, and in so doing drew the walls together. The other bars were then treated in the same manner. And many other cases could be cited.

### OBITUARY.

**MR. AXEL PRIOR.**—Mr. Prior, who has just died at Copenhagen, was one of the largest slate merchants and purveyors of building materials in Denmark. He commenced business in 1867, and by his own exertions raised his business to the position of the largest of its kind in Denmark. Mr. Prior's upright character as well as his business abilities gained him the general respect and esteem of those who had dealings with him. His son and his partner Mr. Allan Petersen succeed him in the business.

### GENERAL BUILDING NEWS.

#### CHURCH EXTENSION, ST. JOHN'S, FELIXSTOWE.

—The present accommodation of St. John's, Felixstowe, having been found to be inadequate it has been decided that the building shall be enlarged. When the extension work is complete, the church will be, internally, 35 ft. 6 in. long by 25 ft. 6 in. wide. On the south side there will be a morning chapel 30 ft. 6 in. by 16 ft. 6 in., partly divided from the choir by an arcade. Two vestries for the choir and clergy are placed on the north side of the chancel, and will be divided by a movable partition, so that the two rooms may be thrown into one. The organ will be placed over the choir vestry, and access will be gained to it by a circular iron staircase placed in the north-west corner of the chancel, which will supply wind to the organ, will be placed in a small chamber below the choir vestry. The chancel will be lighted by a three-light, mullioned and traceried east window, and by two lancets on the north side. Light will be admitted to the morning chapel by a three-light window at the east end, and single-light windows in the south side. Provision has been made for augmenting and extending the existing heating apparatus, and the gas. The contractor for the work is Mr. Fred Thurman, of Felixstowe, and the architects (who also built the nave and aisles) are Sir Arthur Blomfield, A.R.A., & Sons.

**CHURCH EXTENSION, STIRCHLEY, KING'S NORTON.**—The memorial stone of the new Church of the Ascension, Stirchley, has just been laid. The architect is Mr. W. Hale, Birmingham, and the builder is Mr. T. Smith.

**LODGE, &c., FECHNEY SCHOOL, PERTH.**—The Directors of Fechny Industrial School are erecting a new entrance gateway and lodge at this school in the Glasgow-road. These occupy the site of the old entrance and the Toll House. The architect is Mr. David Smart, Perth. The contractors are:—Mason work, A. Beveridge; joiner, D. Crichton; slater, J. Buchan; plumber, Frew & Sons; and plasterer, John Peebles—all of Perth.

**SCHOOL FOR BLIND CHILDREN, WAVERTREE, LIVERPOOL.**—A new school for blind children has been erected on the site of Wavertree Hall. The building affords accommodation for about ninety children. The principal entrance is approached from Church-road, and is placed in the centre of the main block, which is set back about 150 ft. from the road. On either side of the principal entrance are placed a waiting-room and a committee-room, a master's sitting-room, a master's office, and office, a dining-room, and behind these a range of five classrooms, each entered from a central corridor which runs from end to end of the building. These classrooms are separated from each other and from the corridor by glazed screens. The boys' and girls' staircases, which are 90 ft. apart, are placed at either end of the central corridor, and beyond the boys' staircase is the approach to the gymnasium, which is situated at the south-east corner of the

\* Merrill, "Stones for Building and Decoration," 1897, p. 465; also "Silliman Amer. Jour.," vol. xvii., p. 136.

† "Trans. Roy. Soc. Edinburgh," vol. xiii., p. 366.

‡ "Min. Proc. Inst. C.E.," vol. xxvi., 1867, p. 249; *id.*, vol. xxxiii., 1872, p. 141; *id.*, vol. liii., 1878, p. 208.

§ "Metals," 1894, p. 217.

\* Atkinson "Ganot's Physics," 1893, p. 294.



main block, in front of which it projects. Its dimensions are 40 ft. by 25 ft. The walls are faced internally with buff and light red bricks above a glazed brick dado. The projection formed by the gymnasium is balanced by a projecting wing at the north-east corner of the building, consisting of a miniature hospital. The dining-hall, 47 ft. 6 in. by 16 ft. 6 in., is placed in a wing projecting from the north-west corner of the main block, and communicates through a serving-room with the kitchen department. The first floor is occupied by children's dormitories, baths, ward-rooms, and bed-rooms for the matron, officers, and servants. The basement floor extends under nearly the whole building. There are also wide open areas outside the main walls, and on this floor are constructed large day-rooms for boys and girls, a large work-room 57 ft. by 18 ft. 6 in. for the children's instruction in industrial work, and a kindergarten-room. There is a double lift between the basement ground, and first floors, and telephone communications between various parts of the building for the use of the matron and staff. The building was designed by Messrs. H. & A. P. Fry, and the work was carried out by Messrs. Morrison & Sons, W. Waverlee.

**WESLEYAN CHAPEL, CARDIFF.**—On the 23rd ult. a new Wesleyan chapel was opened at Albany-road, Cardiff. The block of buildings consists of the chapel proper, vestries, parlours, class-rooms, &c., which, although spreading over a considerable amount of ground, are connected and tied together by the tower, which rises to a height of about 100 ft. The principal entrance is through a lobby in the tower, and gives access in addition to the chapel, to a parlour and class-rooms, and to the ground floor, with parlour and other class-rooms on the floors above. The general arrangement of the chapel is nave, transepts, and side aisles, with a choir, organ chamber, and galleries. The building was constructed with Newbridge stone facings, and Bath stone dressings. The cost of the buildings is £8,000, and there is sitting accommodation in the church for 350 persons. The contractors are Messrs. E. Turner & Sons, of Cardiff, and the architects Messrs. J. P. Jones, Richards, & Budgen.

**EBENEZER NEW SCHOOLS, NEWCASTLE, STAFFORDSHIRE.**—On the 17th ult. the new Sunday schools attached to the Ebenezer Church of the Methodist New Connexion, Newcastle, were opened. The building consists of two floors, the lower comprising five class-rooms for girls and seven for boys, with offices, staircases, &c., and on the upper floor is a room which is intended for two additional class-rooms for girls, this being 40 ft. by 20 ft., with a smaller room 16 ft. by 17 ft., which can be converted into a retiring room. There is also an assembly room measuring 60 ft. by 35 ft. 6 in., with rostrum. The girls' school is entirely new, and the old lecture hall has been converted into the boys' school of seven class-rooms and assembly room upstairs. The entrance is from Merriall-street, with a back entrance from Shoreditch. The work has been carried out according to the plans of Mr. John Lewis, architect, Newcastle, by Mr. Bagnall, contractor, Fenton.

**SUNDAY SCHOOLS, COVENTRY.**—The foundation-stones have just been laid of new Sunday school buildings in Vine-street. The work is in the hands of Mr. C. Hayward, jun., who is carrying out the plans of Messrs. Steane, the architects. The total cost of the buildings is estimated to be £1,500.

**BOARD SCHOOL, SALFORD.**—The memorial-stone of the school that is in course of erection by the Salford School Board in Langworthy-road, Pendleton, was laid on the 18th ult. The school will contain three departments, accommodating respectively 376 boys, 376 girls, and 442 infants, making a total of 1,194. The boys' and girls' departments will each contain a schoolroom and four class-rooms divided by movable partitions, together with the necessary cloak-rooms and rooms for teachers. The infants' school is being built on the central hall system, a large assembly hall being provided into which seven class-rooms open, each accommodating from fifty to sixty children. Special provision is being made for instruction in cookery and laundry work for girls, and in manual instruction for boys. A caretaker's house is also being erected at one end of the site. The architects are Messrs. Potts, Son, & Hennings, of Manchester. The contract for the main building is being carried out by Messrs. Storrs, Sons, & Co., Limited, Stalybridge; the iron and steel work by Messrs. Dunkerley & Co., Manchester; and the concreting and asphaltting by Messrs. Davies & Co., Manchester.

**INTERMEDIATE SCHOOL, BRYNMAWR, MONMOUTHSHIRE.**—The new county intermediate school for Brynmawr was opened on the 23rd ult. Accommodation is provided for 100 scholars. The total cost of the building is £18,837, and the work has been carried out from plans prepared by Messrs. J. H. Phillips, of Cardiff, and F. Baldwin, of Brecon, by Mr. John Jenkins, of Brynmawr.

**SCHOOL, GWALDGYDARTH, GLAMORGANSHIRE.**—A new school has just been opened at Gwaldgydarth for the Pentyrch School Board. The new building will be used as a mixed department, accommodation having been provided for 214 children. Mr. Bruce Vaughan, Cardiff, was the architect, and the contractors were Messrs. G. & J. Higgin, of Gwaldgydarth. The schools are divided into five

class-rooms. The two large rooms are divided by a glazed movable screen, which will admit when the rooms are open of floor-space for 150 people.

**SCHOOL ACCOMMODATION, ALDEY, SUFFOLK.**—A new schoolroom has been erected in the parish of Aldey. It is 45 ft. long by 20 ft. wide. Mr. Pells, of Beccles, is the architect, and Mr. Dunn, of Beccles, is the builder.

**SUNDAY SCHOOLS, SHEFFIELD.**—On the 21st ult. the new schools in Rockingham-street, Sheffield, which are attached to the Wesleyan Methodist Chapel, were opened. In the centre of the main front to Rockingham-street is the principal entrance. Right and left of the building are the entrances for boys and girls, and a fourth entrance is provided from Rockingham-lane. On the lower ground floor, which is four steps below Rockingham-street, are provided entrance hall (prepared for use as a gymnasium), and infants' school and class-rooms, laid with wood block flooring. On this floor also are the heating-vault, stores, and a kitchen. From the entrance hall a staircase leads up to the main floor, the greater part of which is occupied by the lecture hall, 50 ft. square. This hall is lighted by ten windows. The ceiling, which is 16 ft. high, is divided into twelve bays, panelled and moulded in pitch pine. At the other end of the hall is a rostrum. Above the lecture hall is the mixed school for boys and girls, having the same floor area as the lecture hall, and is 20 ft. high at the sides and 30 ft. high in the centre. It is flanked by two sets of sliding partitions. In addition to the rooms already mentioned, there are two large class-rooms opening off the main staircase, also lavatories, &c. The whole of the work has been carried out from the designs and under the superintendence of Mr. Herbert W. Lockwood, architect, Sheffield. The total cost of the scheme is about £4,600.

**SCHOOL, CANNOCK, STAFFORDSHIRE.**—At the last monthly meeting of the Cannock School Board, plans for the enlargement of Walsall-road Boys' School were presented by Messrs. Bailey & McConnell, architects, of Walsall. The Board approved them, and the architects were instructed to prepare the necessary plans and specifications and submit them to the Education Department for approval.

**SCHOOL, CLACTON-ON-SEA.**—At a meeting of the church and congregation worshipping at Christ Church, Clacton-on-Sea (Union-Congregationalist and Baptist), the designs of Mr. T. H. Baker, of the firm of Baker & May, architects and surveyors, of Colchester and Clacton-on-Sea, were adopted for the extension of the church new school, including organ with class-rooms, &c., the estimated cost being £2,500.

**NURSES' HOME, SUNDELAND.**—On the 10th ult. the new Nurses' Home attached to the Sunderland Infirmary buildings was opened. The new home has been constructed in harmony with the rest of the building in Durham-road by Mr. Walter Scott, contractor, from plans by Messrs. J. Potts & Son, of Sunderland and Newcastle.

**CO-OPERATIVE PREMISES, COALVILLE, LEICESTERSHIRE.**—New Co-operative Buildings have been erected at Coalville, near the new market, to serve as stores and steam bakery. The premises have cost about £3,000, and the work has been carried out by Mr. W. Moss, of Coalville, the architect being Mr. T. Fosbrooke (Keates and Fosbrooke, Leicester).

**ALHAMBRA THEATRE, BIRMINGHAM.**—It is proposed to erect at the top of Corporation-street, Birmingham, a new theatre (Alhambra) with suite of shops, arcade, offices, &c. The plans, which have been passed by the Improvements Committee, were prepared by Mr. Frank Matcham, of London.

**CORPORATION BATHS, HUNSLLET, LEEDS.**—The new baths in Joseph-street, Hunsllet, constitute the fourth set of baths erected by the Leeds Corporation. About 12,000 ft. has been or will be spent upon the Joseph-street baths. The exterior is of brick and stone. The large swimming-bath is 75 ft. by 30 ft., and a diving platform and the usual dressing-boxes have been provided. There is also a gymnasium. The first-class swimming-bath is 63 ft. by 24 ft., and there are closed dressing-boxes on either side. There are also fifteen first and second class slipper baths, and five vapour baths. The buildings were designed by Messrs. Walter Handcock & Son, architects, of Batley and Leeds, and the various contracts have been carried out by Leeds firms.

**PREMISES, BELFAST.**—The old premises of the National Bank, at the High-street end of Sugar House Entry, Belfast, have been altered for Messrs. Crane & Sons, Limited, piano and organ manufacturers. The alterations and decorations were carried out by local contractors, under the supervision of Messrs. Young & Mackenzie, architects, Belfast.

**RICHMOND WORKHOUSE: PROPOSED EXTENSIONS.**—It is proposed to extend the Richmond workhouse buildings, from plans prepared by Mr. E. J. Partridge.

**NEW PREMISES, TRAFFORD PARK.**—Messrs. W. T. Glover & Co., electric cable manufacturers, have commenced the erection of new workshops and offices, covering two acres of land, in Trafford Park, near the Manchester Ship Canal. Mr. Nuttall is the contractor for the foundations, and Messrs. Bourne & Sons the builders for the superstructure. The architect is Mr. Charles Heathcote, Manchester.

**VILLAGE HALL, ONCHAN, ISLE OF MAN.**—The Lieutenant-Governor of the Isle of Man, Lord Henniker, recently opened a new village hall, which has been erected in the village of Onchan, near Douglas. The hall has been built by Mr. W. M. Adam from designs of Mr. M. H. Scott.

**PARISH - ROOM, CUCKFIELD, SUSSEX.**—A new parish-room has just been erected at Cuckfield. The room measures about 40 ft. by 20 ft. The architect was Mr. Helliwell, of London, and the builder Mr. S. Knight, of Cuckfield.

**FIRE BRIGADE STATION, LEWISHAM.**—A fire brigade station is being erected on part of the site of old Lewisham House. There are twelve different sets of married men's quarters, to accommodate one engineer, nine firemen, and two coachmen, with two spare sets. The quarters consist of kitchen, bedroom, and scullery, the engineer having an extra room. There is stabling for four horses. The work is being carried out under Mr. Thomas Blashill, Architect to the London County Council, Mr. R. Pearsall, assistant architect, being in charge of it. The contractors are Messrs. Holloway Bros., of Battersea. Mr. Schneider is the clerk of works.

**PROPOSED LODGING-HOUSE, DUNFERMLINE.**—It is proposed to erect a lodging-house at Dunfermline. A site has been procured at the corner of Chapel-street and Bruce-street. The building will accommodate 141 people. The architect is Mr. MacLennan, Dunfermline.

**THE "CORONET" THEATRE, NOTTING HILL.**—The "Coronet" Theatre, Notting Hill, an illustration and a brief description of which appeared in our issue of January 15 last, was opened on Monday. Mr. W. G. R. Sprague was the architect, and Mr. Walter Wallis was the builder. The decorations and furnishing have been carried out by Messrs. Warrings. The heating contract was carried out by Messrs. Stride & Co., and the electric lighting work was by Messrs. Sax Slatter & Co.

**NEW WING, TRADES HALL, DUBLIN.**—On the 24th ult. a new wing to the Trades Hall was opened. The addition comprises six small committee-rooms, three large committee-rooms, and a large hall capable of accommodating several hundred persons. The structure was erected by Mr. Goulding, while the architect was Mr. Beardwood.

**THEATRE, SOUTHAMPTON.**—The new Grand Theatre at Southampton has been erected at a cost of 20,000. The entire building will be lighted by electricity, with gas as an alternative. Mr. W. Hope, of Newcastle-on-Tyne, was the architect, and the builders were Messrs. Jenkins & Sons, of Southampton.

**ISOLATION HOSPITAL, COCKINGTON, DEVONSHIRE.**—Cockington Isolation Hospital was opened on the 24th ult. The main building is one story in height, and on the first floor are the principal wards, each measuring 25 ft. by 12 ft., and 11 ft. high. Four beds can be placed in each ward, and a nurse's room between has glass doors communicating with the wards separately. The nurses' bedroom, with bath-room and other offices, are in the rear. Another ward for special or private cases is on the ground floor, where also there are two nurses' rooms, one of which can be used for infectious cases in times of emergency. Designed by Mr. Rowell, of Newton, the premises have been built of local red rock by Mr. H. Phare, of Cockington.

**COTTAGE HOSPITAL, LEOMINSTER.**—A new cottage hospital is in course of erection at Leominster—the foundation-stone of which was laid on the 24th ult. It is built in two separate blocks of buildings connected by a corridor; the hospital portion and the wards being a distinct building at the rear, whilst the nurses' house faces the street. It is built of red pressed bricks for facings, with terra-cotta panels, ornaments, string and moulded cornices, and bay windows, carried up to the roof, terminating with half-timbered gables of oak, which will be treated and rubbed in oil to preserve the natural colour of the oak. All the roofs are of red Broseley tiles throughout. The walls will be plastered with "Adamant," and the ceilings, walls, and floors rendered non-absorbent. An operating-room is included, with large lantern-light, for surgical operations. The contract has been let to Mr. John Watkins, builder, of Leominster, who is carrying out the work from the designs, plans, and superintendence of the architect, Mr. Ernest G. Davies, of Hereford.

**ADDITIONS TO HOTEL, BRISTOL.**—The new restaurant in connexion with the Bank Hotel at the top of Bridge-street, Bristol, is now completed. In altering a portion of the premises for the restaurant, Mr. Mackay, architect, superintended the reconstruction, which has been carried out by Mr. C. A. Hayes.

**EXHIBITION BUILDINGS, GLASGOW.**—Mr. James Miller, the architect of the International Exhibition, is preparing a sketch of a covered way from the bridge across the Dumbarton-road to the Industrial Section and the Fine Art Galleries. It is to be made of glass and iron, with space for the display of flowers, and the corridor is to be not less than 35 ft. wide. Mr. Miller suggests that if the older portion of the Kelvingrove Museum, namely, Kelvingrove House, could be removed a very much better position would be obtained for the concert hall on its site, which would enable the restaurants attached to the concert hall to be placed next to the Kelvin, with an uninterrupted view over the park to the west. Authority is to be asked from the Town



Council to take down Kelvingrove House, possession to be given to the Exhibition authorities from January 1, 1900. Borings having been made in connexion with the dome and towers a rock foundation has been found at an average depth of 17 ft.—*Glasgow Evening News.*

**PUBLIC INSTITUTE, SOUTHVARK.**—On Monday the Duke of Cambridge opened the institute which has been erected by the trustees of the charities of St. Olave and St. John, at the junction of Tooley-street and Fair-street. The materials used are blue pennant stone, for the plinth and basement windows; red brick facings, from Mr. Jas. Brown, of Braintree, Essex; and Monk's Park stone for the upper windows, coracles, and copings. The building comprises:—On the basement—A gymnasium, the book-store for the lending library; a club smoking room; men's cloak room, lavatory; and the boiler room for the warming apparatus. On the ground floor.—The principal entrance hall in Fair-street, giving access to the billiard-room and private clubroom, with lavatory attached; and the staircase ascending to the hall. A separate entrance, adjoining the above, is provided from Fair-street to the lending library; and from the open way on the south-east side, the caretaker's apartments, the stairs down to the gymnasium, and the exit stairs from the hall are approached. Iron spiral stairs from the lobby next the billiard-room and lending library respectively give access to the smoking-room and book store in the basement, and a tea and coffee bar is provided, adjoining the billiard-room. The upper part of the gymnasium occupies a part of the ground floor area. Ascending the stairs from the entrance, the large hall is reached on the first floor, the whole of which, fronting on to Fair-street and Artillery-lane, is occupied by it. The site compels the hall to assume a wedge-shaped form on plan, and the platform or small stage is placed at the narrow edge; a small staircase at the north-west angle gives access to a gallery for musicians over the main staircase. In connexion with the platform are retiring-rooms for ladies and gentlemen, and at the south-west angle of the hall is the door leading to the exit staircase before referred to. The caretaker's apartments consist of a kitchen on the ground floor, with stores, and a passage communicating with the library, and two floors of living-rooms, and bedrooms, &c., over the retiring-rooms, and are contained in a separate wing of the building at the south-west angle of the site. The lending library is of irregular shape, and contains bookcases and wall-shelves capable of containing between 8,000 and 9,000 books. The book-store, in the basement, in connexion with the library, is capable of containing about 10,000 additional volumes. The large hall, on the first floor, is about 78 ft. long on its central axis, with a width at the north-west end of about 55 ft., and of about 17 ft. at the south-east end at the back of the platform; it is 25 ft. high to the ceiling, and will seat about 350 persons. It is intended to use this hall as a retiring-room in connexion with the library when it is not required for meetings or entertainments. The floor of the hall is laid with wood blocks on a fire-proof foundation, composed of Stuart & Co.'s patent Granolithic flooring; the principal and exit staircases are also formed of this material. The hall is also ventilated by windows opening towards Fair-street and Artillery-lane, and with sky-lights on the south side. It is warmed by hot water pipes on the low pressure system, fitted up by Messrs. Wm. Baily & Sons. Fresh air is also admitted through gratings under the windows into an air-chamber between the wall and dado framing, and the air so admitted is also warmed by the hot-water pipes, which are placed in this chamber. The several portions of the building to be used by the public are lighted by electric light, the installation and fittings having been executed by Mr. W. Mackie. A secondary lighting system by gas has also been fitted up in compliance with the regulations of the London County Council. The architect was Mr. Henry Stock, the architect to the trustees; and the buildings have been erected by Mr. William Shepherd. Mr. Peacock was the clerk of the works.

**BUSINESS PREMISES, BELFAST.**—New premises for Mr. Rea have been erected in Ann-street by Mr. W. Kerr, under the superintendence of Mr. S. Stevenson, architect. The walls have been lined with glazed tiles by Messrs. Minton & Hollins, through Messrs. W. D. Henderson & Sons, Belfast. Mr. J. H. Crook was the contractor for the ornamental ironwork.

**CANON-RW, WESTMINSTER.**—Mr. J. Dixon Butler, Surveyor to the Metropolitan Police, has been appointed architect for the new police-station, with an extension of the chief offices of New Scotland-yard adjoining, to be erected in Canon-row, in place of the station in King-street now being demolished. For that purpose will be taken the buildings at present occupied by the Civil Service Commissioners. That structure, distinguished by its Ionic portico and circular hall, was built for uses of the Ordnance and Transport Office, but proving too small for that department, it was then assigned to the Board of Commissioners for the Affairs of India. The authorship of the building has been ascribed to William Atkinson; but it was built in 1816, from the plans and designs of William Pilkington. Atkinson designed the house (the old office of the Master

General and Board of Ordnance) in Pall Mall for Edward, Duke of York and Albany, son of George IV., which was afterwards occupied by Henry, Duke of Cumberland. The house then became a subscription club house, called the Albion Hotel, being the first of its kind in the more modern meaning of the word "club," in Pall Mall; it is now the War Office.

**FACTORY, BRISTOL.**—A new clothing factory has been erected at Staple Hill for Messrs. Wathen, Gardiner, & Co. The premises cover an acre of ground, the main building measuring 270 ft. by 150 ft. The whole of this is lighted from the roof, which is supported on iron columns, with light steel trusses and framing. The whole building is warmed by hot-water apparatus, supplied by Messrs. Crispin & Sons, who have also put in the stoves for the pressing department. The elevations generally are of Pennant stone, with Cattybrook brick dressings and cornices, the central block being entirely of brick, with Broseley tile roof. The general contract has been carried out by Messrs. Cowlin & Son, and the sanitary engineering by Mr. G. Tuckey. The architects for the whole of the works were Messrs. La Trobe & Weston, of Bristol.

**PUBLIC CONVENIENCES, BIRMINGHAM.**—For some months past the contractor has been engaged in the construction of the underground lavatories, &c., in the Bull Ring and the Old Square. The one in the Bull Ring is now complete. Two large apartments have been constructed beneath a paved island just below the Nelson Statue. The island is pear-shaped, and in order to avoid a slope there is a transverse step across the centre. This step approximately marks the division of the space below, the one nearest the Nelson Statue being for women, while the lower and larger section is for men. Entrance to the women's lavatory is by a semi-circular staircase, protected by an iron railing. There are eighteen steps of York stone, between walls of white glazed brick, the staircase leading to an open space 16 ft. long by 4 ft. wide, paved with black and white tiles. To the left of this space is the lavatory. On the opposite side of the open space are six closets, divided from one another by slabs of dark green marble, reaching to a height of 7 ft. 6 in., and having doors of oiled teak. The wall spaces are of white glazed brick, with a wainscoting of red marble. Light is derived from prismatic pavement lights. The men's department is lavatories, &c., on the east of the two lower corners of the island. It contains a number of radial pattern stalls of white glazed porcelain with red marble jambs, and granite treads. There are seven closets, and the lavatory and dressing-room is an enclosure of wood-work and Murensian glass. The walls, fittings, and paving are similar to those in the women's department. At the top of the wall dividing the two departments is a ventilating fan immediately beneath the central lamp upon the island, the pillar of which forms a ventilating shaft. The entire establishment has been constructed at a cost of 2,000 l. by Mr. Jennings, of Lambeth, from the designs of Mr. Price, the City Surveyor.—*Birmingham Post.*

**BUSINESS PREMISES, PERTH.**—Under an Act of Parliament, procured about five years ago, the Police Commissioners of Perth got authority to make a new street from South-street to Mill-street in line with Kinnoull-street and Scott-street. One of the buildings in the street is Brand's buildings, which is situated at the corner of South-street and Scott-street, and is a four-story tenement of shops, offices, and dwelling-houses. The building was designed and erected under the personal superintendence of Mr. David Smart, architect, Perth. The contractors were—Mason work, Robert Brand & Son; joiner work, Leith & Lumsden; slater, James Buchan; plumber, James MacLeish; plasterer, John Mackay—all of Perth.

#### SANITARY AND ENGINEERING NEWS.

**REFUSE DESTROYER FOR HARTLEPOOL.**—On the 22nd ult. Mr. W. O. E. Meade King, C.E., an Inspector of the Local Government Board, held an inquiry at Hartlepool in reference to the application of the Corporation to borrow 5,793 l. for the provision of a refuse destructor and deposit in G.W.A. Street, Hartlepool. A provisional contract has been entered into with Messrs. Goddard, Massey, & Warren. Mr. Crumrack (Borough Engineer) and the Town Clerk, having given evidence, the inquiry closed.

**DRAINAGE AND FORESHORE IMPROVEMENT OF GRANGE, LANSHIRE.**—On the 24th ult., an inquiry was held at Grange-over-Sands, in G.W.A. Duca, Local Government Board Inspector, respecting an application by the Urban Council to borrow 10,000 l. to cover the outlay of a supplementary sewerage scheme and certain enclosure works. Mr. J. H. Ward, Surveyor to the Council, who had prepared the foreshore improvement plans, and Mr. Spinks, C.E., of Leeds, who had designed the drainage scheme, were examined in reference to details.

**APPOINTMENT OF SANITARY INSPECTOR.**—The Local Government Board has sanctioned the appointment of Mr. J. W. King as a sanitary inspector in Chelsea.

#### STAINED GLASS AND DECORATION.

**STAINED WINDOW, WESTHOUGHTON CHURCH.**—Messrs. Clayton & Bell, of London, have in hand a new stained window which is intended to be placed in the north clerestory of St. Bartholomew's Church, Westhoughton, in memory of the late Mr. George Vernon Chadwick. The window will represent the patron saints of England (St. George), Scotland (St. Andrew), and Ireland (St. Patrick); a quatrefoil in the upper part bearing an illustration of the arms of the United Kingdom.

**ORGAN CASE, ESSEX CHURCH, KENSINGTON.**—Sir John T. Brunner, M.P., has recently presented to this church a new organ case. The work has been designed in the style of the fourteenth century screen work, and has been carried out in oak left in its natural colour. The organ is placed in the south-east angle of the south aisle and shows on two sides to the church, the sides being divided into bays with open and cusped arcading surmounted with a carved cornice. This forms the main stage of the organ case, all the spaces being filled in with burnished metal speaking pipes. The upper portion above the cornice is arranged into gables with tracery panels, and corbelled portions carrying a further tier of speaking pipes and finishing in pinnacles and crockets. The work has been designed by Mr. H. Chatfield Clarke, and has been carried out by the builder of the organ, Mr. Alfred Kirkland.

**WINDOW, ST. BARNABAS, HOVE.**—A window at the east end of the south aisle of St. Barnabas, Hove, has just been filled in with stained glass. The subject is that of the Nativity. The work was designed and executed in the studios of Messrs. A. Seward & Co., of Lancaster.

#### FOREIGN.

**FRANCE.**—M. Blavette, Government architect, has just been elected architect to the Natural History Museum in place of M. Dutert, who has been obliged to resign on account of bad health. M. Emile Bertone, who is now inspector of the works of the new Opera Comique, has been elected inspector of the new Cour des Comptes, the construction of which was entrusted to M. Moyaux. Lastly, MM. Courtois-Suffit and Mondou have been elected architects respectively to the Institut Agronomique and to the Musée Guimet.—A society calling itself "Société des amis de la Médaille," and having at its head MM. Jules Claretie and Roger Marx, has just been formed in Paris to encourage medal engraving. It is announced that a statue of Jules Ferry is shortly to be erected at Tunis, at the intersection of the Avenue de la Marine and the Palace and Carthage Boulevards.—There is talk of erecting the monument in honour of Puvion de Chavannes on the Place Percée, and of giving the name of the great artist to a street newly opened in the neighbourhood, between the Rue d'Amiens and the Boulevard Percée.—The President of the Republic has just inaugurated the new Ecole Supérieure de Commerce at Paris. This large building is in the Avenue de la République. The successful competitors in the open competition were MM. Joanny Bernard and Emile Robert.—A tunnel five kilometers long has been completed lately; it goes through the hills of Haute, in the neighbourhood of the forest of St. Germain. It goes from Mautcourt to Triel, and is intended to convey the flow from the Paris sewers to the fields below Triel. This work, which has been rendered very difficult by the nature of the ground, has been most successfully accomplished by MM. Laumann and Launay, Engineers to the City of Paris.—The death of M. Georges Landelle, the painter, is announced. He was a pupil of Cabanel, and of his father, Charles Landelle. He died at the age of thirty-eight. He exhibited, at various Salons from 1885 to 1895, both landscapes and figures.—The death is also announced, at the age of eighty-two, of M. Auguste Decaux, civil engineer, who for many years superintended the ateliers for dyeing the Beauvais and Gobelin tapestries.

**UNITED STATES.**—In Boston a decided stand is being made against the further erection of what are known as "cheap frame buildings." According to *Architecture and Building*, the conditions under which a large share of the outlying residential sections of the city were built up favoured this class of buildings. The result has been a large growth of cheap frame buildings. These now are becoming, as the land is being closely built up, a menace to the city from fire. The Metropolitan Park Board some time since recognised the dangers from a sanitary point of view of this crowding of small dwellings on these outlying lands, and has been putting forth efforts to reserve playgrounds and small parks, and now it is thought to be time to determine that at least a measure of safety from fire should be required in these buildings.

**CANADA.**—More than usual interest attached to the eighth meeting of the Quebec Association of Architects held at Montreal early last month, as it was the occasion of the complete organisation of the Association in accordance with the terms of the Quebec Architects' Act. The first day was entirely devoted to the reports and addresses by the outgoing and incoming presidents. On the second day visits were made to the Agricultural Department of McGill University, ably presided over by Professor S. H. Capper, the new building of Chemistry and



Mining, McGill University, &c. The attendance at the business sessions numbered between fifty and sixty.

**CALCUTTA.**—Mr. A. J. Hughes, Engineer to the Corporation, has drawn up a scheme for the reconstruction of Calcutta. His plan is based on the Bombay Improvement Act, which has recently received the sanction of the Secretary of State, and it aims at such reforms as the abolition of slums, construction of new streets, housing of the working classes, &c.

### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Messrs. Bedford & Kilsom, architects, have removed their offices from 12 East Parade to Greek-street-chambers, Leeds. —Mr. F. W. Marks, architect, has removed from 31, Great James-street, Bedford-row, to 3, Staple Inn, W.C. —Mr. Herbert A. Satchell, architect, has removed from 3, Verulam-buildings, Gray's Inn, to 3, Staple Inn, W.C.

**STREET FOUNTAINS AND CATTLE TROUGHS.**—The Metropolitan Drinking Fountain and Cattle Trough Association have closed their Works Department, intending to place the care of the fountains and troughs under the various vestries. Mr. R. D. Gibbs, who has been for upwards of thirty years connected with the Association as manager of their works at Clapham, and has erected for the Association more than 1,000 fountains and troughs in London and the suburbs, intends still to pursue this business, and no doubt his practical experience in such work will be very valuable. The character of the designs, however, ought to be improved.

**PUBLIC IMPROVEMENTS, FALMOUTH.**—Mr. H. P. Bounois held an inquiry at Falmouth on the 26th ult. on behalf of the Local Government Board into an application by the Corporation for power to borrow 5,000*l.* for street improvements and 2,347*l.* for sewerage. The Town Clerk stated that the population at the last census was 12,217. The area was 857 acres, rateable value 30,624*l.*, outstanding loans 14,000*l.* (Urban Sanitary), and 1,620*l.* (Town Council). For improving Market Strand, by filling in the foreshore, they asked permission to borrow 4,500*l.*, and for sewerage works in connexion with that improvement 1,947*l.* Mr. W. H. Tresidder, Borough Surveyor, stated that the scheme he had prepared would do away with the nuisances complained of by the owners.

**THE MANUFACTURE OF CALCIUM CARBIDE.**—Londoners are evidently keenly alive to the commercial possibilities of acetylene as an illuminant, for, despite the inclemency of the weather on a Monday evening last, there was an unusually large attendance at Professor Lewes' second Cantor lecture on "Acetylene" at the Society of Arts. In this lecture Professor Lewes dealt mainly with the commercial manufacture of calcium carbide, and described the forms of electric furnace which are employed for converting the mixture of coke and lime into carbide of calcium. Referring to the possibility of making carbide without the aid of electricity, Professor Lewes said that, although he was aware that Dr. Borchers and other experimenters had claimed that they could produce calcic carbide on a large scale without employing electrical power, yet he was unable to conceive of any such method or process which was likely to compete successfully with the commercial product with calcic carbide made in the electric furnace. With regard to the impurities in acetylene made from commercial carbide, Professor Lewes said that sulphuretted hydrogen and traces of phosphoretted hydrogen were nearly always present, and demonstrated how the sulphuretted hydrogen could be easily detected by means of lead acetate, and how, after removal of the sulphuretted hydrogen, the phosphoretted hydrogen could be detected by means of silver nitrate. The lecture next Monday evening will deal with the various types of acetylene generator, and the methods by which the gas may be purified for domestic consumption.

**REDEDOS, ST. ANDREW'S CHURCH, MELKSHAM, WILTS.**—On the 23rd ult., at St. Andrew's Church, Melksham Forest, a rededoss which has been erected by Messrs. Hems & Sons, Exeter, as a memorial to the late Mr. R. L. Lopes, J.P., of Sandridge park, Melksham, was dedicated. The rededoss is mainly composed of white alabaster from the Derbyshire quarries, but is relieved by tinted material of the same kind. The central portion comprises three panels, with canopies crocketed and cusped, which are supported by trefoil pink marble columns, with carved capitals. The central panel is occupied by a sculptured figure representing the Ascension of our Lord. The side panels contain figures of the Virgin Mary and St. John the Divine, the latter with chalice and book. These panels have a background of gold mosaic. Upon the buttresses above the rededoss are figures of four angels in marble adorning the pediment. The pediment itself is of red-tinted alabaster.

**STREET IMPROVEMENTS IN ABERDEEN.**—The first meeting of the streets and roads committee of the Aberdeen Town Council was held on the 24th ult. A new street is to be laid out on the Spital estate, running from Bedford-road parallel with the old Sunnyside-road, and turning westward to join Bedford-place. The street is to be 30 ft. in width. Wellbrae-street, Mannohield, will in future be known as Wellbrae-terrace. It was reported that a piece of ground had been bought at Don-terrace, Woodside,

to allow of the thoroughfare being widened to the uniform limit. A letter was read from Mr. R. G. Wilson, architect, with regard to certain alterations on the Angusfield property, belonging to the Rubislaw Granite Company, but the committee could not see their way to agree to the suggestions contained in the communication. Mr. Pirie, contractor, was the successful offerer for the macadamising and laying of a kerb and channel in Chestnut-row, the amount of the contract being 26*l.* 18*s.* 3*d.*

**CONDITION OF LONDON BRIDGE.**—Mr. Norrish, Surveyor to Southwark Board of Works, has reported to his Board the results of his examination of the arches beneath Railway Approach, Borough High-bridge, on which the commencement of London Bridge is built. He found cracks in them, and is taking steps to watch if these develop.

**FONT, ST. ANDREW'S CHURCH, PAIGINTON.**—Messrs. Harry Hems & Sons, of Exeter, have just placed in the newly-built Church of St. Andrew, Paiginton, an old Norman font. The font has been resited, all the whitewash having been removed, and the original pattern of sculpture exposed. Messrs. Hems have mounted the restored font on a base of Devonshire variegated marble, with a supporting cluster of eight columns of Purbeck marble. The font itself is of Paiginton red sandstone.

**BUILDING INDUSTRIES' FEDERATION.**—A federation, comprising all the branches of the building trade, has recently been formed at Newport, Monmouth. The federation is worked upon similar lines to similar organisations in other large towns. Mr. Charles Jones is the secretary, and Mr. W. Thomas treasurer.

**FOREST GATE AND UPTON PARK.**—Messrs. Tuckett & Son offered by auction at the "Princess Alice" Hotel, Romford-road, on the evening of the 24th ult., the fifteenth portion of the Pleshet Hall Estate, comprising sixty-four lots in Halley-road, which realised from 72*l.* to 76*l.* per lot, and twenty shop lots in White Post-lane which made from 115*l.* to 143*l.* per lot. There was a very large company present and much keen competition, the whole of the eighty-four lots being quickly disposed of for a total closely approaching 7,300*l.* This result shows a further marked appreciation in value, consequent upon the continuous development of the neighbourhood. The auctioneers have now sold about 2,000 lots upon this portion of the Gurney Estate, most of which have been built upon and occupied, whilst many more houses are in course of erection, and the demand exceeds the supply.

**APPOINTMENT.**—Mr. Henry Lord, of Manchester, has been appointed architect of the proposed cottage homes for the Salford Union at Kenyon Junction.

### CAPITAL AND LABOUR.

**A WAGES QUESTION, BRISTOL.**—A meeting of the Bristol Trades Council was held on the 24th ult., at the "Crown and Dove" Hotel, Bridewell-street, under the presidency of Mr. J. O'Grady, when Messrs. E. H. Jarvis and C. Lambert brought forward a matter which had been taken in hand by the Bristol branch of the Amalgamated Society of Carpenters and Joiners. They respectively moved "Resolved, that the Trades Council of Bristol should express its disapproval of the action of the Bristol Board of Guardians with respect to the advertisement in the local papers for a carpenter at 29*s.* per week, and urges that the recognised rate of wages for the city should be paid by the Guardians, as they hold the rate to be a public body should not endeavour to get its work done at less than private employers have to pay." The resolution was carried.

**STAFFORDSHIRE BUILDING TRADE.**—The building trade in the Potteries for the season of the year is very good, and there is every prospect of a continuance of the same. There are a number of large contracts in the district besides the extra artisans' dwellings that are being erected in most of the pottery towns. Bricklayers report employment as good and they are fully employed. Joiners are busy with a small percentage out of work. These are principally out-of-doors. Plumbers are working well, but painters are not so busy. Plasterers report employment as good, with none out of work. Stone-masons are busy and overtime is worked in some yards. Labourers in the building trade are well employed, and through the extension of the tramways what surplus labourers there were have found work. In the brick and tile yards throughout the district orders are plentiful, and the operatives are working the full complement of hours usual at this time of the year. At Crewe all branches are busy, and full time is general. At Leek there are good orders, but the wet weather has stopped all out-door work. At Stafford all operatives are well employed.—*Staffordshire Sentinel.*

### LEGAL.

#### THE WORKMEN'S COMPENSATION ACT:

##### CASE IN COURT OF APPEAL.

**THE case of Billings v. Holloway** came before the Court of Appeal composed of Lords Justices A. L. Smith, Rigby, and Collins on the 19th ult. on the appeal of the plaintiff from the judgment of Judge Addison, Q.C., sitting at the Clerkenwell County Court. It appeared that the plaintiff was a

labourer in the employment of the defendant, a builder, who, in July last, was erecting a building in the Clerkenwell-road under a contract with the building owner. The building was in substitution of one which the defendant had previously demolished, and when erected according to the plans the new building would be a four-storied building over 30 ft. in height. The new building was being erected by means of scaffolding, and during the course of the building operations a brick fell upon the plaintiff's head and injured him. When the accident happened no part of the building had reached the height of 30 ft., the highest point being 26 ft. from the basement. The plaintiff claimed compensation under the Workmen's Compensation Act, 1897, but the Judge in the Court below held that as the building was not more than 30 ft. in height the Act did not apply, and entered judgment for the defendant. The material part of Section 7, sub-Section 1 of the Act runs:—"This Act shall only apply to employment . . . on or in or about any building which exceeds 30 ft. in height and is either being constructed or repaired by means of a scaffolding or being demolished. . . ."

Mr. Bassett Hopkins now submitted that the Act applied if the building in course of erection was when finished to exceed 30 ft. in height. The test was not the actual height of the building at the time of the accident. The test was what would be the height of the building when completed.

Lord Justice Smith, without calling upon Mr. Rugg, Q.C., and Mr. A. W. Grosor for the defendant, in giving judgment said that if the plaintiff's contention was right, the court ought to add to Section 7, sub-section 1 of the Act, the words, "or which may hereafter exceed 30 ft. in height," and that could not be done. He thought the decision of the learned County Court Judge ought to be affirmed.

Lord Justices Rigby and Collins concurred, and the appeal was accordingly dismissed.

#### THE WORKMEN'S COMPENSATION ACT:

##### CASE IN THE COURT OF APPEAL.

**THE case of Powell v. Brown and Another**, which came before the Court of Appeal on Saturday, the 20th ult., raised an important question relating to the liability of builders under the Workmen's Compensation Act, 1897. The case came before the Court on the appeal of the defendants, Messrs. Brown & Backhouse, builders and contractors, of Natham-street, Liverpool, and it appeared that William Powell, the man in respect of whose death the proceedings were taken, was in their employment as a carter. On the day that the accident happened one of the defendants' carts was standing in the street near to the entrance of their premises, upon which certain timber taken from their premises had been placed, it being Powell's duty to arrange the timber in the cart. He was standing on the timber in the cart, and was waiting for some bolts to complete the load, when accidentally a piece of the timber tilted and threw him into the road, and in consequence of the injuries he received he died. Judge Collier, sitting at the Liverpool County Court, held that the defendant's premises were a "factory" within the meaning of the Act, and that the accident arose out of and in the course of the deceased's employment, and that that employment was employment on or in or about a factory. He accordingly awarded the widow 243*l.* odd. The defendants now appealed on the ground that Powell's employment was not employment "on or in or about a factory" within the meaning of Section 7 Sub-section 1 of the Act in question.

Their Lordships at the conclusion of the arguments of Counsel, dismissed the appeal, holding that the question in issue was one of fact, and that the County Court Judge had found that the employment of Powell was "on or in or about a factory."

Mr. Joseph Walton, Q.C., and Mr. Aspinall Tobin were counsel for the appellants; and Mr. Rugg, Q.C., and Mr. H. Thomas for the respondent.

#### THE WORKMAN'S COMPENSATION ACT.

On the 24th ult., at Southwark County Court, his Honour Judge Addison, Q.C., heard an application under the Workman's Compensation Act. The applicant was James Williams, a window blind painter, of North-street, Kennington-road, and the respondent William Duncan, window blind manufacturer, of Newington-caneway.

His Honour: Is it a point of law or fact in this case?

Mr. Sherman (for the respondent): A point of law, sir.

His Honour: I have tried only three cases under this Act, and each has contained a point of law for the Appeal Court. I have disposed of no less than six points of law in those actions, and, curiously enough, have had to find for the respondents in each case.

The applicant stated that he entered the respondent's employ as a blind painter on July 6, and remained until August 30, when he was seized with violent pains in the abdomen, and had to leave work. He had to call in a medical man, who said he was suffering from colic. In consequence, he had been unable to work for fifteen weeks, and was still far from well. He had been a painter twenty-



five years, and had never before had colic. In cross-examination, the applicant said that ordinary white lead was used by him while in the respondent's service, but the Home Office regulations were not complied with. The weather was exceedingly hot at the time.

The respondent denied that the Home Office regulations were not carried out in his factory.

Mr. Sherman submitted that the applicant must fail, because illness contracted through employment was not an accident within the meaning of the Act, which read:—"If in any employment to which this Act applies personal injury by accident arising out of and in the course of the employment is caused to a workman, the employer shall be responsible." This was not "injury by accident." This point was mentioned when the Act was in the House of Commons. The question of the "phossy jaw" was then raised, and it was asked if this could be called an "accident." The answer of the Government was that they were advised not. If lead poisoning was to be an accident within the meaning of the Act, it would have been made clear by "accident" being defined. Nobody could say in plain English that sickness was accident.

His Honour: I must construe the word "accident," so meant by the Act, not in the dictionary sense. Sickness in a broad sense is an accident of life.

After further argument on this point, his honour found for the respondent on the ground that the applicant had not suffered "personal injury caused by accident." He, however, assessed the applicant's damages at 6*l.* 10*s.* in view of an appeal.

#### IMPORTANT ACTION BETWEEN BUILDERS MERCHANTS AND A FIRM OF BUILDERS: CASE IN THE COURT OF APPEAL.

THE case of Chapman Bros. v. Harding Bros. came before the Court of Appeal, composed of Lords Justices A. L. Smith, Rigby, and Collins, on the 29th ult. on the defendants' appeal from the judgment of Mr. Justice Darling, sitting without a jury in the Queen's Bench Division on February 24 last.

Mr. Montague Lush appeared as counsel for the defendants (the appellants); and Mr. Mattinson, Q.C., and Mr. Sinclair Cox for the respondents (the plaintiffs).

It appeared from the opening statement of Mr. Lush that the plaintiffs were builders and merchants, carrying on business at Croydon, and that they were the sole agents of the Silicon Plaster Manufacturing Company in the district of Croydon. The plaintiffs claimed against the defendants, a firm of builders carrying on business in the neighbourhood of Haslemere, Surrey, 10*l.* 18*s.*, the price of granite silicon plaster manufactured by the company, and supplied to the defendants in March and April, 1897. The defendants pleaded that the plaster was sold under an implied warranty as being reasonably fit for the purpose for which it was bought, but owing to its unfitness they had suffered damage, for which they counter-claimed. Mr. Justice Darling gave judgment for the plaintiffs both on the claim for counterclaim, and from this decision the defendants now appealed. The learned counsel stated that the defendants in the early part of 1897 entered into a contract with a Mr. Leigh Smith to do some extensive work at his house at Haslemere, such work being carried out under the direction of Mr. J. W. Penfold, architect. During the course of the work Messrs. Harding Bros. had to plaster a very large number of walls, and having used on a previous occasion granite silicon plaster they ordered a parcel from the plaintiffs, who were the company's agents in this district. Messrs. Hardings used other kinds of plaster in addition to the granite plaster in several of the rooms, but, with regard to the granite plaster, with the most disastrous results, as after the plaster had been put on the walls and the paper put on the plaster an extraordinary growth of fungus developed which gradually ate into the paper and afterwards the walls had to be stripped and re-papered, and it was in consequence of the expense Messrs. Hardings were put to with regard to this that they made their counterclaim. Mr. Justice Darling held that Messrs. Hardings had not proved that the defect was due to the plaster and gave judgment against defendants. The learned Counsel said that he should not have appealed on a question of fact if he did not think that the evidence all pointed in his clients' favour.

Lord Justice Smith: I suppose the contention is that it is the fault of the walls and not of the Plaster?

Mr. Lush: Well, Messrs. Hardings used four kinds of plasters, using some in some rooms and not in others. All the rooms where the granite plaster was used turned out as I explained, and all the rooms which had the other three plasters were perfectly good. Messrs. Chapman Bros. contended that the cause of the defect was that there were some kinds of bricks which unfortunately did not suit this particular granite plaster, and during the evidence it was admitted that they had had two cases before in which the granite plaster had turned out badly. They said that some bricks had got sulphur or salt in them, which did not suit that particular plaster. The learned counsel said that the

house in question was a large one, a portion of which was very old, and it was proved that there were four different classes of bricks on which the plaster was used; but notwithstanding that, where the granite plaster was used the result was the same. There was still a further answer to this suggestion of Messrs. Chapman Bros., and that was that where the plaster was used on the same walls in the house the result was exactly the same, viz., the fungus growth occurred.

Mr. Mattinson, on behalf of Messrs. Chapman Bros., said that so far as the counterclaim was concerned, Messrs. Hardings proved that they had spent 23*l.* odd in repairing the mischief alleged to be done by the plaster in question, and if his learned friend's case was right Messrs. Chapman Bros. would be liable for this 23*l.*, or the greater part of it at any rate. It was also suggested that they (Messrs. Hardings) were entitled to damages amounting to 54*l.*, or thereabouts, for penalties which they alleged in their particulars they had actually paid to Mr. Leigh Smith who employed them. At the trial it turned out that they had not paid Mr. Leigh Smith sixpence.

Mr. Lush: Is that so?

Mr. Mattinson replied that he thought he was right in stating that, in point of fact, the money had never been paid. But, apart altogether from that, it was perfectly clear, on a point of law, that the damage could not be recovered against his clients, because there was no suggestion that there was any communication to them—that was to say, to the vendors of the plaster—that the stuff was to be used in connexion with a contract where the purchaser was under a penalty to complete by a certain time. Such a thing was never suggested until long after the goods were delivered, and long after the trouble had manifested itself.

In answer to Lord Justice Smith, the learned counsel said that the granite plaster was used on both bricks and laths, and the peculiarity was that where it was put on bricks something was wrong, but where it was put on laths or on ceilings it was perfectly right. That was a very important circumstance to remember. He suggested that that proved the trouble was due to the place where the plaster was applied.

Lord Justice Smith: If you can show that this plaster was good on some part of the brickwork and not on others you would have had some foothold; but, as I understand, this plaster was bad wherever it was put on brick or stone. Where it was put on stone it went wrong.

Mr. Mattinson said it was proved that the plaster sent to Messrs. Hardings was only a portion of a much larger quantity of the stuff manufactured, which was sent to other people and there were no other complaints from the other people whatever, with regard to that particular bulk of manufacture. The learned counsel, continuing, said that there were a great many things which must not be lost sight of, and one of the chief was that the purchaser of the plaster had to mix it according to directions, which were sent on delivery of the parcel. The trouble might have occurred through that; Messrs. Chapman Bros. had no means of knowing, as again, there was evidence that the house was damp, and had ivy upon it. It must also be remembered that nearly all the plaster that was used in the house was granite plaster, and Mr. Moore Smith, an architect who had inspected the work, had said that there were not two dozen patches in the whole place, and that he did not think it could be due to any fault in the plaster; and Mr. Turner, also an architect, corroborated Mr. Smith. The learned counsel, in conclusion, submitted that it was for Messrs. Hardings to make out their case on their counterclaim, and this he contended they had not done. He also contended that there was no implied warranty of the plaster under Section 14 of the Sale of Goods Act, 1893.

Mr. Sinclair Cox having followed on the same side, and Mr. Lush having replied,

Lord Justice Smith, in giving judgment, after having stated the facts, said that there could be no doubt that Messrs. Chapman Bros. were entitled to the amount they sued for; or, at any rate, for that portion which represented the price of the plaster supplied for the rafters, as distinct from that supplied for brickwork and stone. He could not help thinking that, on the order given by Messrs. Hardings to Messrs. Chapman Bros., there was an implied warranty given by the latter that the plaster which was going to be supplied was reasonably fit for the purpose for which it was known to be put by Messrs. Hardings. On the other part of the case, he thought the evidence showed not in the bricks, and although he was sorry to differ from his brother Darling on a question of fact, he felt that the case must go down for a new trial, for the damages to be assessed on the counterclaim. He thought that the parties would be well advised if they could agree as to the damages, and so put an end to the whole matter.

Lords Justices Rigby and Collins concurred.

It was ultimately arranged that judgment should be entered for the plaintiffs on the claim for 10*l.* 18*s.* and that the case should go back for a new trial for damages to be assessed on the counterclaim. The appeal was accordingly allowed with costs.

#### EMPLOYERS' LIABILITY CASE.

In the Recorder's Court, Belfast, on the 29th ult., before his Honour Judge Fitzgibbon, an action was brought under the Employers' Liability Act by Samuel M'Michael, 25, Jenny-mountain-street, Belfast, labourer, against Jacob W. Lester, Milewater-road, Belfast, builder and contractor, to recover 12*l.* 10*s.*, loss and damage sustained whilst working in the defendant's service at Milewater-road, Belfast, where, plaintiff alleged, he received injuries to his right hand, resulting in the loss of his thumb, by a defective crane.

Mr. Hanna (instructed by Mr. M'Erlean) represented the plaintiff, and Mr. Thomas Harrison (instructed by Messrs. Bigger & Strahan) appeared for the defendant.

Mr. Hanna, in opening the case, said the facts were as follows:—M'Michael, who was a labourer, was employed on August 12 at a crane. The crane was used for the purpose of raising timber logs out of a pond, and they were thence placed upon a carriage on which they were carried through the yard. It was customary that a man should assist the person working at the crane, as the logs were about two ton in weight, and this was, of course, a great strain on the crane. His client had raised one of the logs a certain distance. There should be a man to assist in pushing the log on the carriage at this stage, as the log was on tension. If there was no assistant the method was to put the crane out of gear when the log was suspended in its place. In running the crane out of gear his client's hand had been caught between the cogs, with the result that the right thumb was torn away from the hand. Since that accident took place a wooden wedge had been used for stopping the crane. It was whilst he was holding the crane handle, and whilst the log was in tension, that the handle slipped into the machine, and his thumb was caught in the manner described. His client had been earning 10*s.* a week, and for seven weeks the employer gave him full wages, but he went down at the end of eight weeks he would not give his client any more money unless he came into the yard as a working man. There would have been no difficulty in calling a person to assist him, but on that occasion there was no one near to do so.

Plaintiff, in reply to Mr. Harrison, said on the eighth week subsequent to the accident defendant threatened to cut off his wages if he would not stop his nonsense with the solicitor. Witness said a solicitor three days after the accident took place. Defendant told him his job would be open for him when he got better, and asked him to do some light work. Witness did not sign an agreement (in consideration of a course plaintiff had taken) that he would forego any other claims he had under the Workmen's Compensation Act of 1897, but he put his mark to a paper.

The defendant deposed that the crane in question was a modern one, and perfect in its arrangements. The logs in question were light as compared to the lifting capacity of the crane, so one of the handles was taken off. If the plaintiff had been in his right place at the handle, he would have been 5 ft. or 6 ft. distant from the cogs. No change had been made in the machine since the accident. From the bend of the handle to the cog-wheels the distance would be 2 ft. or 3 ft. It would not be possible for the handle to slip in that distance. Plaintiff assisted a sawyer at the machine. Witness had suggested that the plaintiff had left his place and was leaning against the wheels when his hand was caught.

Mr. Hanna stated that if they failed under the Employers' Liability Act they were entitled to proceed under Sub-section 4 of Section 1 of the Workmen's Compensation Act of 1897, which stated that "the Court in which the action was tried shall, if the plaintiff shall so choose, proceed to assess such compensation as the plaintiff may be entitled to under this Act, and shall be at liberty to deduct from such compensation all the costs which in this judgment have been caused by the plaintiff bringing the action instead of proceeding under a new Act."

His Honour said with regard to the liability under the old Employers' Liability Act, he thought it was perfectly clear that that accident was brought about by negligence of the man himself. It was stated that two men were engaged at the crane, one a sawyer and the other a man at the wheel to turn it. What right had he to commence working in the absence of the sawyer? If he had worked with the sawyer the accident would not have occurred. Then the plaintiff said that there was some imperfection in the crane, and that the handle went in, and his hand was injured by that defect in the crane. The answer to that was the evidence that the crane was a perfect one. The accident could not be sustained under the Employers' Liability Act. Under the new Act Mr. Hanna had shown how they could proceed. Defendant was bound to compensate plaintiff so long as he was disabled from working. When a medical certificate could be obtained that plaintiff was capable of working defendant could stop the weekly allowance. His Honour thereupon granted the following certificate:—"I certify for 8*s.* a week from second week after the accident, credit to be given for the sums allowed, and credit also to be given for the costs of that procedure."



## MEETINGS.

FRIDAY, DECEMBER 3.

**Architectural Association: Discussion Section.**—Mr. A. E. Henderson on "Santa Sophia, Constantinople, and Excursions into Asia Minor." 7 p.m.  
**Clarendon and West of Scotland Technical College (Architectural Craftsman's Society).**—(1) Mr. D. Bennett Dobson on "Calculations Simplified." (2) Mr. W. H. Baxter on "Shoring and Slapping." 8 p.m.

SATURDAY, DECEMBER 3.

**Carpenters' Hall, London Wall.**—Building and Sanitary Construction Examination (oral). 12 noon.

MONDAY, DECEMBER 5.

**Royal Institute of British Architects.**—(1) Election of Candidates for Membership. (2) Mr. R. W. Gibson, "On Fireproof Construction of Buildings in the United States." 8 p.m.

**Society of Engineers.**—Mr. G. Thudichum on "The Bacterial Treatment of Sewage." 7.30 p.m.  
**Society of Arts (Civilian Section).**—Professor Vivian B. Lewes on "Acetylene." III. 8 p.m.

**Leeds and Yorkshire Architectural Society.**—Mr. Max Clarke on "Brickwork Tests." Illustrated. 6.30 p.m.  
**Liverpool Architectural Society.**—Mr. William H. Thorp on "Early Italian Renaissance Sculptors and their Works." With Limelight Illustrations. 6 p.m.

TUESDAY, DECEMBER 6.

**Institution of Civil Engineers.**—(1) Further Discussion on Mr. Stanley Robert Kay's paper on "The Effect of Subsidence due to Coal Workings upon Bridges and Railways." (2) Mr. E. Bond on "Buttresses, Pinnacles, and Flying Buttresses." 8 p.m.

**Northampton Institution, Clarendon Lectures on Architecture.**—Mr. E. Bond on "Buttresses, Pinnacles, and Flying Buttresses." 8 p.m.  
**Royal Victoria Hall, Waterloo-road.**—Mr. C. Field Bayley on "Photography in Colours." 8.30 p.m.

WEDNESDAY, DECEMBER 7.

**British Archaeological Association.**—The Rev. W. S. Lach-Szyrma, M.A., on "The Ancient University of Britain." 8 p.m.

**British Foremen and Clerks of Works' Institution.**—Ordinary meeting of the members. 8 p.m.  
**Society of Arts.**—Mr. W. T. Maud on "Egypt and the Soudan, in 1897 and 1898." 8 p.m.

THURSDAY, DECEMBER 8.

**Society of Antiquaries.**—8.30 p.m.  
**Institution of Electrical Engineers.**—(1) Professor Oliver Lodge, F.R.S., on "Improvements in Magnetic Space Telegraphy." (2, time permitting) Mr. Sydney Evered on "Telegraphy by Magnetic Induction." 8 p.m.

FRIDAY, DECEMBER 9.

**Royal Institute of British Architects.**—Annual Dinner, to be held at 7.30 p.m., in connection with the Birmingham Architectural Association, at the Grand Hotel, Birmingham. The President, Professor Atchley, R.A., will hold a reception at the Rooms of the Society of Artists between 5 and 6 p.m., and a short business meeting will be held immediately afterwards, and before the dinner.  
**Architectural Association.**—Mr. Edwin T. Hall on "The Position of Architecture among the Fine Arts." 7.30 p.m.

**Institution of Junior Engineers (Westminster Palace Hotel, Victoria-road).**—Mr. E. A. Heath on "British Cable Tramways, and their Construction." 8 p.m.

SATURDAY, DECEMBER 10.

**British Institute of Certified Carpenters.**—Visit to the Charterhouse. 9.30 p.m. Annual Meeting at Carpenters' Hall at 6 p.m.

## RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until January 9.

[1897] 55,775.—**STAY OR CROSS WIRE FOR WIRE FENCING.** J. S. Mooney & W. J. Mooney. The invention relates to an apparatus for applying stay or cross wires and weaving them upon the longitudinal wires of a fence by means of a revolvable shaft made in the form of a crank and fitted with slotted journals for engaging the longitudinal wires, and with perforations for the stay wires which pass through the journals and wind upon spool spindles secured to the crank portion of the shaft.

25,193.—**A BRICK THAT REQUIRES NO BURNING.** J. Allen. The brick is composed of sand 3 bushel, coke breeze 4 bushel, coal dust 2 bushel, and Portland cement 2 bushel. The ingredients "will make when mixed together twenty-five of the improved bricks that require no burning."

25,382.—**COMPOSITIONS FOR USE IN CONSTRUCTING ELECTRICAL HEATING APPARATUS AND RESISTANCES.** Fawcett. Powders, which (in parts) and washed plastic clay (4 parts) are mixed, dried, and pressed, the moulded articles are baked with charcoal in a closed receptacle at a temperature a little below nickel's melting point. The articles to which the contact devices are connected are reinforced by adding to them before they are subjected to pressure powdered nickel (90 parts) and washed plastic clay (10 parts).

26,466.—**FURNACE OR DESTRUCTOR FOR BURNING HOUSE AND TOWN REFUSE.** C. W. Saint. H.M. Inspector of Mines. The leading feature of the construction is a series of horizontal flues, which are connected, back-to-back, or otherwise, which communicate with a common distributing flue at the rear end and with a further flue at the forward end under the control of dampers or valves, which are so manipulated as to cause the unconsumed gases of one furnace to pass into any of the other furnaces, and thence into the flue at the front end of such cell before they escape into the chimney.

26,500.—**METHOD OF PAINTING ANTI-CORROSION COMPOSITIONS.** C. J. Grist. Linseed or other drying oil is partially oxidized by heat, after the addition of varnish, to a stage at which it causes the disintegration of fibres of hair, jute, &c., immersed into the cooled oil, but immediately taken out again; then the dipped fibres are placed in a hydro-extractor for clearing them of varnish, which is so manipulated as to cause the varnish exposed to a current of heated air, and turned about, until

each particle of oil on them is oxidized and dried; the fibres are again subjected to the foregoing process, until each of them is coated with oxidized oil; they are then ground together by rollers, colouring matter being added—say, for each 100 lbs. of raw material, from 7 lbs. to 10 lbs. of chrome or Brunswick blue, or ochre. The mixture, when cooled, is placed in a vessel containing 32 lbs. to 45 lbs. of kerosene or other solvent, and then are added from 8 lbs. to 16 lbs. of shellac, 8 lbs. to 16 lbs. of gum, 8 lbs. to 16 lbs. of resin, 2 lbs. to 4 lbs. of methylated spirits, and 2 lbs. to 4 lbs. of barytes, or borate of manganese, as a drier. For anti-corrosive paints colouring matter is not added, but the fibres are reduced with spirit to the consistency of paint, from 1 to 5 per cent. of arsenical or other salt being added at the time of rolling, to destroy living organisms.

27,016.—**APPARATUS FOR BURNING ACETYLENE AND OTHER RICH GASES.** A. C. Frazer. The invention provides for making a mixture of the gas with air, the admixture taking place in the flame by conducting the gas and air under pressure to the burner and discharging them as to spread the gas and air into an extremely thin film of mixed gas and air; in a modification, each burner is constructed with two ducts or conduits, for air and gas respectively, terminating in jet apertures, the ducts being put into communication, by cocks and pipes, with the two sources of supply.

27,214.—**SELF-CLOSING VALVE FOR USE WITH GAS BURNERS.** J. J. Thorne. In order to prevent leakage, a device is provided as follows:—Before the burner tap or burner is put a valve chamber having an inlet from the gas-pipe and an outlet to the burner; the side of the chamber opposite to the inlet is formed of a flexible diaphragm or of a movable bell, sealed with mercury, glycerine, &c.; this flexible surface is slightly pressed by a spring or weight so that when the valve is closed it rests against the orifice, a much greater pressure than exists in the gas-pipe is required to lift it; when gas is turned off at the meter, while the burner tap is open, the diaphragm or valve is pressed against the orifice by the weight or spring, and the orifice being small, remains closed when the meter tap is turned on again, whilst gas cannot escape through the open burner tap. When the gas is to be lighted the diaphragm must be drawn back; the gas pressure keeps it in position.

27,599.—**ELECTRICAL CURRENT METER.** J. Mohrle. For driving the current meter winding coils traversed by the current are influenced by a fixed coil in a manner dependent upon the current to be measured; the pendulum, made of a cross-bar with two arms carrying a tripartite coil, is suspended from the top of the meter, the counting wheel is effected so that the latter is operated without a special driving device, influenced only by the pendulum, but the driving of the counting wheel is effected by the pendulum itself, thus friction is reduced to a minimum.

28,618.—**FIXING-BLOCKS.** G. Connell. These are composed of a backing of cotton brick, concrete, stone, or other material, and a facing plate of wood, the wood-facing is attached to a brick-backing by means of grooves or sinkings filled with cement after being tightened with wedges, and to cast concrete backing by bolts passing through, or metal strips, or sinkings for filing.

29,008.—**MANUFACTURE OF CALCIUM CARBIDE.** J. Baskerville & W. A. Thorne. The carbide is made either separately or roughly mixed, are passed together to the grinding machine, where they are reduced to the proper size, prior to entering the elevator buckets, the ground and mixed material is then passed to a trough which conveys it to the electrical furnace where the current fuses the two materials.

29,027.—**WATER TAPS.** A. Wren. The water tap has two valves, one being the ordinary screw-down valve and the other being a plug valve fitted in the passage that leads to the screw-down valve; the passage is bored out taperwise for a hollow taper which is tightly seated therein; an opening in one side of the tapered plug communicates with the supply passage, and a short spindle passes down to stuffing-box, having a knob or handle at its lower end; thus water may be turned on or off by the handle, which can be then removed without allowing water to escape from the tap.

29,077.—**FIXED PANES OR PANELS OF STAINED OR OTHER GLASS OR OTHER TRANSPARENT MATERIAL.** J. Sashes, Casements, Lamps, &c. C. F. Gray. The joints, grooves, or framework are made so that some of the glass lights which are placed in the joints and beyond the panes or panel's level surface, thereby forming and building out facets, pyramids, and prisms, and giving a greater reflection or radiation of light.

29,287.—**SUBSTITUTE FOR LINSEED OIL BODY FOR PAINT, FLOOR-CLOTH MAKING.** C. S. Banner. The compound essentially consists in colophony dissolved in a solvent and saponified in whole or in part, with caustic or silicated soda or potash, or both; instead of colophony the inventor may use a compound thereof with hydrate of lime, as in his Patent No. 11,805, of 1887. The quantities which he finds to be good are 100 parts of colophony, or its compound with lime, and about 18 of caustic soda, but no solvent enough to render the admixture more or less fluid.

29,385.—**VENTILATORS.** J. Constand. The ventilator, which has the usual shaft and outer casing with openings, contains angled baffle plates (arranged concentrically within, and opposite each opening), whose edges are curved out slightly to deflect the air currents and increase their speed over the openings. Within the baffles and opposite the openings left between them, are arranged vertical deflecting plates, which extend upwards from the shaft to the top of the ventilator, and which are curved outwards at their one another, whilst directing them through the outlets. The latter plates project outwards at right angles from the shaft's circumference, and towards the openings between the baffle plates.

[1898] 170.—**A SOLID CORRUGATED DOOR-BOLT PLATE.** G. H. & G. Carter. For strong and cheap door-bolt plates is contrived a corrugated plate wherein the sockets are stamped from the plate itself to form a channel in which the bolt may slide, instead of the usual method of forming the sockets separately from and rivetted on to a plate or making them of pieces of metal rivetted round to form the sockets.

4,884.—**WASHABLE DISTEMPER.** F. C. Gidley. Whiting soaked in water and made into a thick pulp, or any colour ground in water, or a mixture of these, is stirred with one-eighth part of benzine dissolved in turpentine, being warned to promote amalgamation, when the distemper is required for use, a small quantity of water-size should be added.

4,955.—**VENEERS.** H. F. D. Wibrow & J. Paul. For producing veneers of various designs such as "Maser veneers" from knotty or curled woods, veneers forming a pattern, or shaded design, and so on. A number, say from

twenty to twenty-five, of veneers are glued together, and then placed between two blocks or dies, the body being kept in a pliable or yielding condition by steam, the application of strong pressure to the dies makes the veneers take the shape of the dies; why the body is cut in a veneer sawing-machine, and the line of cut, traversing various layers, will produce marked veneering-patterns.

17,141.—**CLOISONNÉ WORK AND MOSAICS.** J. F. After. The claim is for the method of forming the outline of the designs by marking them out with adhesive material, and sprinkling broken particles of glass or other mineral matter on the adhesive material; when the adhesive material is dry the superfluous particles are brushed away, and the design is then permanently outlined in non-fertile materials; by another method the outlines of the design are made with beads threaded on wires or fibrous threads.

19,422.—**SURVEYING INSTRUMENT FOR DELINEATING THE PROFILE OF THE GROUND.** P. Weller. The principle upon which the instrument is based is that so long as the profile of the path is level the marker will make a straight mark or a series of small perforations on the paper, which is withdrawn from the reel at a rate depending upon the speed at which the carriage is driven; but as soon as the profile changes, either up or down, the pendulum will cause the marker to be deflected by a greater or less amount from the position shown, and the marker will travel across the paper at an angle, the amount depending upon the level path's deflection; as soon as the carriage attains a level path the pendulum sets the marker straight again, but so long as the carriage maintains its present elevation the marker will keep its distance from the centre line of the drawing point; it is only after the carriage has gone down an incline corresponding to the one it ascended that the marker will return to the line of its first position.

20,428.—**WINDOW SASH FASTENINGS.** E. Johnstone & C. Ross. The inventors employ a bolt sliding in a handle or knob to actuate the bolt, so that when the handle is pushed forwards the bolt advances until it enters a catch then automatically enters a notch in the bolt and locks it in its forward position; for unlocking, the handle must first be depressed and then pulled backwards, thus the pawl is released, and the bolt can be withdrawn.

## NEW APPLICATIONS.

November 14/99.

20,313. J. C. Jones and Others, Gate Hinges. 23,922. Lord & Miller, Fire Alarms or Boxes for Electrical Signaling. 23,923. J. Halfway, Corrugated Iron or Steel Roofing. 23,930. Dutton & Brearley, Guard for Wood Planing Machine. 23,931. H. O. Bennett and Others, Closet Seat and Lavatory Brackets, &c. 23,939. Kay & Bevan, Slide Levels. 23,943. G. Raper, Composition for Making Moulded Articles. 23,944. Burtons, Potter's Dipping Machine. 23,945. Rhodes & Gaunt, Flushing Cistern Valves and Flushing Apparatus. 23,958. E. Thomson, Electrical Measuring Instruments. 23,961. H. Studios, Schools, &c. 23,963. H. Christensen, Permanent Roofing. 23,966. F. B. Gilbreth, Mixer for Concrete, Cement, &c. 23,967. E. H. Bastable, Safety Lamp. 23,970. P. L. Guyonnet, Electrically Controlled Taps. 23,979. J. Smith, Smoke Consumers and Pressure Reducers. 23,982. H. Fullwood, Mine Ventilation. 23,990. E. Gessner, Fire Gases. 24,023. J. Pohl, Boring and Drilling Machines. 24,028. W. Walker, Air Propellers and Exhaustors. 24,029. Richardson, Weighing Apparatus and Electrical Weighing Machines. 24,038. Brown & Preece, "Panic" and other Bolts. 24,053. M. Murphy, Railway Structures for Electrical Railways. 24,071. McCull's Sliding Hinge Window Company and McCall, Windows. 24,078. J. J. McClelland, Sand Moulding Machine. 24,086. Laiffan & Bury, Production of Marble or Painted Surfaces on Glass, &c. 24,089. H. T. Abel, Marking Gages. 24,095. M. Barry, Water-pipes, &c., for Use in Exposed Situations, &c. 24,101. A. L. Hyn, Copying Devices for Drawings, Documents, &c. 24,107. C. F. Hildreth, Mechanical Door Checks. 24,109-10. B. Berry, Wood, Block Parquet and Similar Flooring, and a Staple. 24,112. D. D. Esion, Apparatus for Recording Road and other Ground Levels and Distances. 24,115. C. H. H. Electricity Meter. 24,133. Hirst & Bevis, and 24,146. N. Stewart, Electrical Arc Lamps. 24,145. E. O. Puddlephat, Raising, Lowering, Traversing, and Transporting Loads. 24,151. Davidson, Ventilators and Buildings, &c. 24,159. H. Bragg, jun., Window Frame, with secret hinge. 24,160. J. Tourtel and others, Coin-fed Frequentation Meters. 24,165. Villaret & Wahlen, Drying and Transporting Devices for Bricks, &c. 24,170. W. M. Scott, Circuit Breaker. 24,204. Rateau & S. Harte & Co., Steam Turbines. 24,211. East Ferry-road Engineering Works Company and Others, Drying White Lead. 24,217. F. Seeding, a Gouge. 24,245. Anne Crook, Self-acting Cooking Steamer. 24,251. E. S. Griffith, Vapor Generating and Heating Apparatus. 24,255. Lenti & Whitehead, Bricks. 24,249. Brady & Bidwell, Lead and Tack for Soil, Ventilating, and Water Pipes. 24,250. W. Wright, "Exhaust Pipe Top for Steam, Air, or Gas, Noise Preventer and Grease Separator for Exhaust Pipes without Back Pressure." 24,260. J. Fieleg, Clamping hollow holes of Glass or Ceramic Products, &c., to be treated in grinding or other Machinery. 24,262. G. H. Noakes, Portable or Endless-Chain Telescopic Elevator. 24,270. Lupton & Co., Multiple Wall-Connections for Electrical Lighting. 24,273. R. Bauer and Others, Lathe Chucks. 24,284. D. Janzi, Cement Strip. 24,285. United Asbestos Company & Fisher, Fireproof Ceilings and Partitions. 24,293. J. Goodson, Tiles. 24,294. R. Bennett, Manufacture of Tiles. 24,295. C. Reinke, Machine for Moulding Bricks. 24,296. A. Foster, Circular Saw Guards and Shields. 24,298. F. Denison, Sanitary Channel Block. 24,300. R. Rotterdam, Fence or Gauge for Use with Self-Saws, Band Saws, and Circular Saws. 24,324. E. Taylor, Appliances for Consuming Smoke and Humidifying Fuel. 24,326. Rose & Hall, Extensible Ladders. 24,331. T. Archer, Domestic Fire-Guards and Spark-Arresters. 24,332. Mrs. Charles Jackson, Vermorel Trap. 24,374. P. Steinmetz, Alternating Electric Current Motors and Distributing Systems. 24,378. E. W. Phelps, Fire and Acid Proof Materials. 24,379. F. W. Murhead, Telephones. 24,381. J. H. Hock, Siding. 24,382. W. T. Hager, Oil Lamps. 24,383. J. H. Hock, Hachetall, Insulating and Equalising Electrical Currents. 24,405. A. Mauser, Hinges for Doors, French Windows. 24,406. W. S. Worthington, Taps or Cocks. 24,415. E. J. Plymss, Burglar and Similar Alarms. 24,417. W. Langdon-Davies, Induction Motors, and Alternating Cur-











**HAYDON-SQUARE.**—Providing and fixing a hot-water coil, and fixing tubular boiler:—  
H. C. Price Lee & Co. £24 0  
Stevens & Sons 47 10  
J. Grundy 36 13  
W. Simmons £16 4  
G. E. Bradley 13 5  
G. Davis 31 0

**HOLLYDALE-ROAD.**—Painting exterior and cleaning interior:—  
T. Freeman & Son £356 0  
W. Akers & Co. 418 10  
H. J. Williams 418 0  
H. Line 406 0  
G. S. Jones £359 10  
W. Banks 354 10  
J. C. Bowyer 348 0  
G. Kemp 320 0

**JOHANNA-STREET.**—Painting exterior and cleaning interior:—  
T. Hooper & Son £473 0  
Edwards & Medway 410 0  
Holliday & Greenwood 399 0  
Lathey Bros. 377 0  
H. & G. Malett 298 0  
G. Britala £351 10  
J. P. Ford 213 10  
B. E. Nightingale 201 0  
W. Horne 170 10  
\* Accepted.

**LAMFORD-ROAD.**—Painting exterior and cleaning interior:—  
T. Gregory & Co. £479 10  
W. R. & A. Hyde 352 17  
E. Flood 365 0  
W. Whiteley 351 7  
W. Horne 350 0  
F. G. Minster £381 0  
O. Craske 375 17  
F. T. Chummen 394 15  
W. Hammonds 296 0  
Bristow & Eatwell 221 13 11

**MONSON-ROAD.**—Cleaning interior:—  
W. Akers & Co. £331 0  
C. S. Jones 331 0  
W. V. Goad 327 0  
E. Proctor 340 0  
J. S. Musgrave £487 15  
Holliday & Greenwood 279 0  
Jones & Goring 254 10  
H. J. Williams 238 0

**OBAN-STREET.**—Cleaning interior:—  
A. E. Symes £310 0  
A. W. Darby 215 0  
J. P. Holliday 231 10  
J. Kybett 224 0  
G. Wales £213 17 6  
T. Robey 212 0  
S. H. Corfield 187 0  
\* Accepted.

**POPE-STREET.**—Painting exterior and cleaning interior:—  
C. Foreman £277 0  
T. Freeman & Son 258 5  
C. S. Jones 230 10  
J. Gwyer 198 17 6  
G. Kemp £299 0  
W. Banks 183 10  
W. Horne 174 6 0

**POPHAM-ROAD.**—Cleaning interior:—  
Gardner & Hazell £220 0  
J. Grover & Son 218 0  
McCormick & Son 212 0  
W. Bunce £194 0  
W. Silk & Son 175 0

**POWIS-STREET.**—Providing and fixing hot-water coils in two basins each basin and girdle departments, and fixing four new S.B. pipes and two tubular boilers:—  
J. C. & J. S. Ellis £121 10  
Stevens & Sons 122 0  
Berry, Campbell & Co. £98 10  
Sharp, O'Brien & Co. 82 0

**RAYWOOD-STREET.**—Cleaning interior:—  
E. P. Bulled & Co. £275 0  
W. Johnson & Co. Ltd. 250 10  
Lathey Bros. 217 0  
W. Chappell £160 0  
C. Goring 151 10  
J. Garrett & Son 128 10

**RICHARD-STREET.**—Cleaning interior:—  
J. Grover & Son £238 0  
W. Silk & Son 225 0  
McCormick & Son 214 0  
Gardner & Hazell £205 0  
C. & W. Hunning 169 15  
Marchant & Hirst 118 15

**ST. PAULS-ROAD.**—Providing auxiliary heating in all departments:—  
Steele & Co. £398 0  
E. Odroyd & Co. Ltd. 254 0  
A. Douglal & Co. Ltd. £277 0

**SUPPLY of Linoleum (including laying) at per sq. yd.:—**  
E. Catesby & Sons 21 7 1/2  
Trelgar & Sons 21 6 1/2  
J. Shoolbred & Co. 21 5 1/2  
\* Recommended for acceptance.

**TEESDALE-STREET.**—Painting exterior and cleaning interior:—  
Johnson & Co. £500 0  
F. & F. J. Wood 481 3  
Sewin Bros. & Co. 389 0  
W. Shurmer 389 0  
S. H. Corfield 318 0  
G. Barker £309 0  
J. Kybett 293 0  
G. Wales 291 0  
J. Haydon 256 0

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT,  
TEAK, VENEER, and TIMBER MERCHANT.  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL,  
HATTON GARDEN, and 29, RAY STREET,  
FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY  
THICKNESS, DRY, AND FIT FOR IMMEDIATE USE.  
Telephone, No. 374 Holborn. Tele. Address "SNEWIN, London."

**TOOTING GRAVEENEY.**—Cleaning interior:—  
Maxwell Bros. Ltd. £241 0  
R. S. Ronald 256 13  
W. Johnson & Co. Ltd. 215 10  
J. Garrett & Son 12 0

**TRINITY-PLACE.**—Cleaning interior:—  
T. Crawley £113 15  
Sewin Bros. & Co. 89 0  
Marchant & Hirst £8 15  
G. Wales 75 0

**UPPER NORTH STREET (Infants).**—Providing and fixing sliding glazed partition and altering widths of stepped flooring, &c. (Second competition):—  
G. Barker £377 0  
A. E. Symes 198 0  
Johnson & Co. 150 0  
J. Kybett £139 0  
Unassigned 195 0  
S. H. Corfield 114 0

**UPTON HOUSE.**—Providing and fixing an apparatus for the supply of tepid water to baths:—  
J. C. & J. S. Ellis £133 0  
J. Wintner-Smith, Gray & Co. 85 15  
J. F. May £28 0

### TO CORRESPONDENTS.

J. F. T., J. and M. R. and W. (Amounts should have been stated). "A Clerk of Works" (Next week).

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. per annum (13 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c. 26s. per annum. Remittances (payable to DOUGLAS FOURDRINER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 10s. per annum (12 numbers) or 4s. 6d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

### HIGH-CLASS JOINERY, LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

### CONSERVATORIES, GREENHOUSES,

### WOODEN BUILDINGS, Bank, Office, & Shop Fittings.

### CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

## THE BATR STONE FIRMS, Ltd.

BATH,  
FOR ALL THE PROVED KINDS OF  
**BATH STONE.**  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

### HAM HILL STONE. DOULTING STONE.

The Ham Hill and Doulting Stone Co.  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son  
The Doulting Stone Co.)

Chief Office:—Norton, Stoke-under-Ham,  
Somerset.

London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava  
Asphalte Company (Mr. H. Glenn), Office, 47,  
Poultry, E.C.—The best and cheapest materials for  
damp courses, railway arches, warehouse floors,  
flat roofs, stables, cow-sheds and milk-rooms,  
granaries, tun-rooms, and terraces. **Asphalte**  
Contractors to the Forth Bridge Co. [ADVT.]

### SPRAGUE & CO.'S, Ltd., INK-PHOTO PROCESS,

4 & 5, East Harding-street,  
Fetter-Lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED  
accurately and with despatch.

**METCHIM & SON** (of GEORGE STREET, WESTMINSTER)  
"QUANTITY SURVEYORS' DIARY AND TABLES,"  
For 1899, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

## Ernest Mathews & Co.

61, St. Mary Axe, E.C.

### SLATES, SLABWORK, Enamelled Slate, Marble, Permanent Green Slates.

WORKS:  
Bow, London, E. and  
Aberleghenny, North Wales

BRANCH HOUSE:  
37, Victoria-street, Bristol.

## PILKINGTON & CO.

(ESTABLISHED 1839),  
MONUMENT CHAMBERS,  
KING WILLIAM STREET, LONDON, E.C.  
Telephone No., 2751 Avenue

## Polonceau Asphalte

PATENT ASPHALTE and FELT ROOFING.  
ACID-RESISTING ASPHALTE.  
WHITE SILICA PAVIN  
SEYSEL ASPHALTE.

# W. DUFFY'S PATENT IMMOVABLE ACME WOOD BLOCK FLOORING.

THE PERFECT FLOORING FOR ALL PURPOSES.

Seven Gold Medals, four Silver, two Bronze Medals, and Certificate of Sanitary Institute of Great Britain.

Full Particulars and Prices on application to

## THE ACME WOOD FLOORING COMPANY, LTD.

Chief Offices and Works: Gainsborough Road, Victoria Park, London, N.E.



# The Builder.

VOL. LXXV, No. 2524.

DECEMBER 10, 1898.

## ILLUSTRATIONS.

New Buildings, Clement's Inn.—Mr. Basil Slade, Architect	Single-Page Photo-Litho.
Illustrations of Venice:—	
Bird's-eye View of Venice, from an old print; Grimani Palace; Fondaco Dei Turchi; Rezzonico Palace	Double-Page Ink-Photo.
Church of SS. Giovanni E. Paolo; Church of Santa Maria De' Frari; A Doorway in St. Mark's; Apse of San Donato, Murano	Double-Page Ink-Photo.
Palazzo Publico, Siena: Portion of facade towards Piazza.—Drawn by Mr. T. R. Kirtell	Single-Page Ink-Photo.
A Wall opposite the Church of S. Moisè, Venice.—Drawn by Mr. T. R. Kirtell	Single-Page Ink-Photo.

## Blocks in Text.

Two Capitals, St. Mark's, Venice	Page 523	New Buildings, Clements Inn.—Plan	Page 523
A New Water-Tap	Page 538		

## CONTENTS.

Incandescent Gas Lighting	519	The Re-building of Clements Inn, W.C.	534	The Student's Column.—Sound, Light, and Heat.—XXIII.	526
The Architect's Use of Books	520	Illustrations of Venice	534	Obituary	535
Notes	520	Sketches from Siena and Venice	534	General Building News	535
Venice	520	Competitions	534	Sanitary and Engineering News	537
The Royal Institute of British Architects	526	Architectural Societies	534	Stained Glass and Decoration	537
Magazines and Reviews	528	Metropolitan Asylums Board	533	Foreign	537
The London County Council	529	Applications under the 1894 London Building Act	533	Miscellaneous	538
The Institution of Civil Engineers	533	Books Received	533	Legal	539
Architectural Association Discussion Section	534	Ventilation of Sewers	533	Meetings	541
Dinner to Mr. C. W. White	534	Ardsman Fever Hospital Competition	533	Recent Patents	541
Engineering Societies	534	Smoke Abatement	533	Some Recent Sales of Property	542

### Incandescent Gas Lighting.



DURING the last decade a very remarkable development in the methods of utilising gas for lighting purposes has been taking place—a development which has resulted

in producing a light of given intensity with less than one-fifth of the quantity of gas required by the common flat flame or argand burners, with a consequent diminution of the objectionable products of combustion—heat, carbon dioxide, and water vapour.

It has long been known that when certain substances are held in a non-luminous gas flame they will become incandescent, and emit a brilliant light without undergoing any perceptible chemical change; and attempts were early made to utilise metallic platinum, and the oxides of calcium and magnesium, for ordinary lighting purposes. The first Welsbach mantles, however, did not make their appearance until the year 1886, and they were then so fragile that their practical utility was not very great, nor did they yield so powerful a light as those of the present day. It may, in fact, be truly said that as recently as ten years ago incandescent gas lights were little more than scientific curiosities; whereas to-day they are used in every quarter of the globe, and number many hundreds of thousands.

The mantles now employed consist simply of oxides of certain metals, and are made by soaking a network hood of ordinary cotton in a solution of salts, which, when dried and ignited, will yield the oxides required. At the present time the Welsbach mantle is said to consist of about 98 per cent. of thoria and 2 per cent. of ceria, while formerly they consisted mainly of zirconia and lanthania. The salts usually employed are the nitrates, as these are soluble in water, and when dried and ignited yield oxides.

After the cotton hood has been soaked in the solution of salts, it is passed through a wringer, dried, stretched into suitable shape, and ignited by means of a gas flame. The

cotton now burns away, but leaves the metallic oxides (which were previously in solution as nitrates in the pores of the cotton mantle) in the form of the mantle. Finally this mantle of oxides is heated over a blast flame to complete the conversion of the nitrates into the oxides, and then it is trimmed into shape and "collodionised." The object of dipping the mantle into a solution of collodion or some substance of a similar nature, is to render it less liable to breakage when handled and during transport, and as soon as the mantle is placed upon the burner and a flame is applied to it, the collodion burns away and leaves the fragile network of oxides.

A remarkable fact concerning these mantles is that no pure oxide is known which will emit much light when heated in the ordinary manner, but that a second oxide, sometimes termed an "excitant," is always required. Thus, a mantle of pure thoria yields very little light, but if 1 per cent. of ceria is added to the thoria a brilliant light is at once emitted, although a mantle of pure ceria also gives very little light. Several theories have been enunciated to account for this phenomenon, but none have yet been satisfactorily demonstrated to be correct.

Another noteworthy feature is that the colour of the light emitted by the mantle varies with its composition, and to a certain extent with the temperature to which it is heated. The two principal English incandescent gas light companies are those popularly known as the "Welsbach" Company and the "Sunlight" Company; and the thoria-ceria mantle sold by the former company emits a greenish-white light, while that of the latter, which consists of the oxides of aluminium and chromium, emits a golden-yellow colour.

Until quite recently a long glass chimney, to increase the air-draught around the burner, was a necessary adjunct to most of the incandescent gas light burners; but a new form of burner, known as the "Kern" burner, has been introduced, which, like the Bandsept burner, requires no chimney of any description, and which will yield an illuminating power of over twenty candles per cubic foot of gas consumed per hour with an ordinary gas pressure of, say, 1½ inches.

The following table shows the claims put forward for the new burner:—

No. of Burner.	Gas Consumption in Cubic Feet with 1-in. Pressure.	Approximate Candle Power.
0	0½	20-22
1	1½	30-36
2	2	50-60
3	3	80-90
4	4	105-120
7	7	185-210

In practice, however, it is commonly found that a satisfactory result is not obtained with a pressure of less than 1½ in., and that the illuminating values actually obtained are about 20 per cent. lower than those quoted in the table. As the pressure increases the consumption of the ungoverned burners of course also increases, but it is usually found that a much higher value per cubic foot of gas is obtained with a 2-in. than with a 1-in. pressure. But even these less favourable figures show so great an increase in the illuminating value of coal gas that the introduction of these new burners and mantles will, without doubt, give coal gas a new lease of life as a lighting agent and strengthen its claim to rank, in towns where gas is as cheap as in London, as the poor man's light; although it is perhaps the suburban shopkeeper who will most largely avail himself of the recent improvements.

The incandescent electric light still remains the most cleanly, convenient, and pleasant form of artificial light, and will doubtless continue to increase in popular favour as it also is improved and cheapened; but in all towns where coal gas is cheap and water-power unavailable, the incandescent gas-light appears destined to take a leading place both as a public and a private illuminant; for even before the new burners were introduced the incandescent gas-light was very largely used both for street lighting and for the illumination of shops and private residences, and when the expiration of patents allows uncontrolled competition in the manufacture and sale of burners and mantles, a substantial fall in prices may be expected, and an increased demand be anticipated.


There is still need for great improvement in the strength of the mantles and in the colour of the light emitted. It is true that the Sunlight mantle is less fragile, and produces a light that is less cold and less

irritating to the eyes; but, as commonly exhibited in shops, it is almost too yellow, and admits of considerable improvement. It does not, however, impart that ghastly pallor to human faces which is so noticeable in rooms illuminated with the thoria-ceria mantles.

In conclusion, mention may be made of those high-power incandescent gas lamps which have recently been introduced to compete with the electric arc lamps. In England, the Hydro-Press and the Somzee-Greyson systems are high-power systems. The pressure of the gas supplied to the burners is increased by means of water power, and when this gas under high pressure is consumed in suitable burners, the mantles, which are specially made for these burners, emit a very powerful light. It is claimed for the Hydro-Press apparatus that a light of about 500 candle-power may be obtained with a gas consumption of about 13 cubic feet per hour and a water consumption of 60 gallons per hour. It will, however, probably be found that the mantles are much more rapidly destroyed under this high-pressure system than by gas burning under the normal district pressure.

In calculating the cost of incandescent gas-light, allowance must, of course, be made for the initial cost of the burners and mantles, which, in the case of the high-pressure system, is very considerable, and also for the cost of new mantles; but it will be found that when these items have been included, the incandescent gas-light still compares very favourably with every other known form of artificial illumination in most towns supplied with coal-gas at a cheap rate.

#### THE ARCHITECT'S USE OF BOOKS.

WO or three weeks ago that excellent sub-section of the Architectural Association, known as the "Discussion Section," had under consideration the subject of "The Architect's Library," on which a paper was read by Mr. Philip A. Robson, a brief résumé of which appeared in our issue of November 26 (page 485). The Editor of this Journal, as being supposed to have seen a good deal of architectural books, was honoured with an invitation to attend on that occasion in the capacity of "special visitor." The function of the "special visitor" is, we believe, to listen to the paper and discussion, and deliver thereafter such words of wisdom in regard to the subject and the discussion as he may have at his command. In the case in question the special visitor was unavoidably prevented from attending, but the following remarks may represent what he would have said if he had been present.

The point which seems to have been specially emphasised by the reader of the paper referred to was that what architects wanted were books with "more illustrations than text," and he instanced the way in which, he said, "the plates in the professional journals were studied and criticised." That represents an attitude which we have often encountered, among the younger generation of the profession especially. There are people, we know, who buy architectural journals merely to bind up the plates and throw the rest away. Now, if there were not a good deal in the letterpress which was worth something better than to throw away, a journal like this would have no right to

exist at all. But to leave the subject of journals, in regard to which we may be supposed to be more or less prejudiced, and take the question in its wider sense, we find the same idea again insisted on in the latter part of the report of Mr. Robson's paper. He recommended "books of reference—histories, dictionaries, encyclopædias, &c., and then books with as little letterpress in them as possible; some of the best and most useful examples of which were, he thought, the A.A. sketch-book, and the folios on the English Renaissance, by Gotch, Belcher, and Macartney." These are all very handsome books, but when we come to their characterisation as the "most useful," we may ask, in what sense "most useful"?

It is to be feared that the real answer is that they are the most useful to "crib" from. That perception, consciously or unconsciously, is at the bottom of all this desire for books with many illustrations and "very little text." The "Architectural Association Sketch Book" is a mine of wealth for this purpose; and that, we imagine, is also the principal value set on the various folio publications illustrating the architecture of the English Renaissance, to which reference was made in the same sentence. The English Renaissance is in fashion at present, and here are books full of large plates of buildings reproduced from photographs, directly at hand to copy details from. Our own impression of the largest of these works was, we must confess, one of disappointment. We expected a collection of measured drawings and a history, and we received what was mainly a collection of photographs. But the publisher was wise in his generation, and offered the architects what they seemed to want—originals to copy from. Mr. Blomfield's octavo book on the English Renaissance, which has more text than illustrations, and no large plates, is a much more valuable book than any of these, because it does not merely give examples, but throws new light on the whole history and meaning of the English Renaissance.

All this attitude towards architectural books—this desire for much illustration and little text, is only one instance of the fact that our younger generation of architects are leaning towards a wrong and one-sided view of their business, and regarding it as their principal end to produce picturesque buildings, founded more or less on the forms of older architecture. All this production of books with "more illustrations than text" only serves to foster and encourage this habit of imitative architecture.

The value of books on architecture which are mainly illustrative is of two or three kinds. They serve to extend our knowledge by bringing before us illustrations of buildings which we may never be able to see. They serve as memorials of buildings which may be in a state of decay, or may for other reasons have to be removed. A monograph which forms a complete illustration and analysis of a great building in all its parts, such as Salzenburg's "Saint Sophia," forms an important lesson in architecture. So also does Mr. Penrose's book on "Athenian Architecture," which we fear would be despised by many of the younger school as presenting no picturesque plates—nothing to "crib" from; but which is a summary of real and special knowledge on a great subject.

But mere collections of sketches, picturesque illustrations, and photographs, teach very little. Rightly used, they may be a means of stimulating the imagination. But they are painfully likely to lead the young architect only to substituting other people's imagination for his own.

Architecture is not only a matter of taste but a matter of knowledge; and the demand for knowledge of all kinds in connexion with it is increasing. To find recommendations for an architectural library to be chiefly composed of illustrations shows how little this fact is realised. Among the most valuable and necessary books for the architect's library are not the show books, which are delightful to look at but which carry with them the temptation to copy, but the books of solid information on such subjects as foundations, roofing, drainage, ventilation, and a score of other things, without a knowledge of which the architect's admiration of the picturesque of ancient buildings will not do him much good. Such a book as Gwilt, though its illustrations are of a most formal and little attractive kind, is what we call a real architect's book *par excellence*; and we recommend a little more attention to that kind of book in forming an ideal architect's library, bearing in mind that architecture implies not only taste but knowledge—and a great deal of it. Select your library accordingly.

#### NOTES.

We are glad to see that, in his address last week on the subject of commercial education.

Commercial Education. Lord Reay, the Chairman of the London School Board, dwelt upon the absolute necessity of a good preparatory education. "They would not succeed," he said, "with any specific commercial school they intended to start unless they had preparatory schools in which a general education was given such as would develop the mind and talents of those who would in the future deal with commercial problems." The truth is that a good, sound, modern education should be the best of all preparations for successful commercial life. This fact we have insisted on in regard to technical education, the foundation of which must be an effective system of elementary education. After all, what have young men to do in commercial and business life but use a well-developed intelligence, and the subjects which they should have studied under any satisfactory system of secondary education? A good handwriting, book-keeping, geography, modern languages, political economy, are the kind of subjects which go to constitute a commercial as well as a good secondary education. The question of commercial education, as Lord Reay said, must be kept separate from technical education; they are distinct. We are inclined to think that if there were a uniform and satisfactory system of secondary education in this country, there would be less need for what is called commercial education as a thing by itself.

The London County Council and Parliament-street Improvement.

THE recommendation that the London County Council do not contribute to the widening of Parliament-street, except to spend 12,000*l.* on the roadways, seems to be perfectly justifiable. The Office of Works



has stated, that such a scheme as has now been begun could be carried out without loss, and it has not been shown by the Government that this will not be the case. The application to the County Council to contribute a very large sum towards the improvement is very much in the nature of "a try-on" by the Treasury. That the County Council might well have contributed if a loss had been likely to occur, we do not know; but even then it would not have altogether been equitable to have asked this body, representing the London taxpayers, to contribute to an improvement, in regard to the carrying out of which they have had no voice. Londoners are by no means satisfied with the way in which Government buildings are erected, and if they are to pay any part of the piper they have a right to a voice in dictating the tune. To ask the ratepayers of London to make the Government, so to say, a present of a few hundred thousand pounds is, therefore, somewhat unreasonable.

**The Fire in New York.**  
THE news of the destruction by fire of the premises of the Home Life Insurance Society in New York, one of the modern high buildings constructed of steel framing and stone or terra-cotta casing, came with a curious irony the same day as the reading of a paper at the Institute of Architects on this class of building as exemplifying "American fireproof construction." The accounts which we have of the disaster from the American correspondents of London papers are oddly conflicting. One account states that it "burned like tinder," which we should think quite impossible considering the materials of which the building was probably mainly composed; another account says that the results showed the fire-resisting power of the structure, as the stories from the eighth to the fourteenth were "destroyed" without any material damage to the building below the eighth story. All accounts seem to agree that the great height of the building added a new fire-risk, from the impossibility of the firemen's hose reaching the flames. It will be interesting to know what the real facts are. We have always believed that these exceptionally high buildings, of whatever material composed, would be very dangerous in case of fire.

**The Church of the Sacré Cœur, Paris.**  
It is announced that the cupola of the Church of the Sacré Cœur at Montmartre, Paris, will be completed for the year 1900. Two-thirds of the work is done, and the summit of the cupola will be reached in the course of next year. The progress seems in reality to be absurdly slow, we presume owing to difficulty in collecting funds. After the completion of the dome, which will be surmounted by a stone cross, five or six months will be spent on the interior decoration; and after the removal of the scaffolding the church, which is very dark at present, will receive a flood of light from the twenty windows of the dome. There will then remain, it is estimated, another three years' work in the erection of the campanile on one side, and the sacristy and presbytery on the other; and there is also another tower to be built, of specially solid design, to receive the great bell called "La Savoyarde." The work was commenced in June 1875, and has cost twenty-four million

francs up to this date; its completion will require another six millions.

**Illustrations of Constantinople.**  
At the meeting of the Architectural Association Discussion Section last week, Mr. Henderson, who has been for some time engaged in making studies of the architectural remains of Constantinople, gave a talk on the subject which derived additional interest from the number of drawings and photographs with which it was illustrated. Saint Sophia has naturally received special attention, and some fine coloured drawings of various portions of the interior and of the detail were exhibited; but Mr. Henderson has also been making measurements and a restoration of the exceedingly interesting fifth-century walls of Constantinople, of which large portions are left, and which, as far as we are aware, have not been illustrated in any published drawings. The measurements for setting out the plan of the walls had to be made almost on the sly, as it may be said, owing to Turkish jealousy and suspicion of all sketchers, and great difficulties were encountered at first in regard to Saint Sophia and other mosques, but by perseverance and the assistance of some friendly officials these have been to a great extent surmounted, and Mr. Henderson has had advantages which English students of architecture in Constantinople have not hitherto enjoyed. We may observe that Mr. Henderson's examination of Saint Sophia has led him to reject the theory put forward in Messrs. Lethaby and Swainson's admirable book, that the dome may have been built without any centering, by laying the courses at a low angle instead of normal to the curve; he says the construction is really a ribbed one, and that he believes the ribs were built on centering and the filling done afterwards. It is to be hoped that the results of Mr. Henderson's assiduous labours will ultimately be given to the world in permanent form in a book, which would probably be a valuable one.

**Revived Wood Engraving.**  
A small group of artists are endeavouring to revive the practice of wood-engraving as a form of original artistic production, not merely a medium for the reproduction of other artists' work; and some seventy examples of their work are on view at the Dutch Gallery in Brook-street. That artists should take up again the actual process of cutting their own designs on the wood is an interesting incident in modern artistic life, and may have the effect of bringing wood-engraving again into favour after it has been so much injured and ousted by the various modern "process" methods of producing blocks for printing. But there is too much of an affectation of the manner of a past age in the works here exhibited. It is of course quite natural that when artists take up wood-cutting as a means of direct artistic expression they should be disposed to return to the old direct system of cutting away lights only and leaving masses of black, instead of defining the subject by thin lines left in relief after a laborious ploughing away the wood from between them; and the mere adoption of the older method may itself give an archaic look to the work. But Mr. T. S. Moore, in his fourteen engravings, is simply imitating the manner and effect of Blake, even to the incident of the rays of

light emanating from behind a nearly black figure, which is seen in one of Blake's "Job" series. Mr. Ricketts, in "The Finding of Chloe," "Venus and Anchises," and others, reproduces the manner of the Poliphilo prints; and some others, such as "Venus and Diana," and "Eros and Anteros," are simply absurd pieces of mock-archaism. Little artistic good can come from this kind of work. Let the artists who are turning their hand to woodwork endeavour to express in it their own spontaneous feeling for effect and expression, in a modern manner, and not be content merely to assume the garb of a past period. There are some works here that are modern in feeling, but over the majority of them there is this assumed archaism; and it is a mistake.

**Bute House Estate, Petersham.**  
WE read that the proposed laying-out of this estate (about twenty-one acres) for building purposes has been arrested by its purchase from Sir J. W. Ellis by a lady who resides in Petersham. Thus the foreground of the view from Richmond Hill will be preserved, as the lady, whose munificence we are pleased to record, intends only to rebuild the church, with a room for a parish institute, in memory of her father. The history of the estate may be briefly summed up thus: James Stuart, the second Earl of Bute (*obit* 1732) married Anne, sister of the second and third Dukes of Argyll, sons of the first Duke by his marriage with Elizabeth, daughter of Sir Lionel Tollemache, owner of Ham House. John, the third Earl of Bute, the celebrated Minister, died in 1792, and was succeeded by his son, the Ranger of Richmond Park, advanced Marquis of Bute in 1796. The church, rebuilt in 1515, and much altered since, is a typical specimen, in red brick, of the "Georgian" style. It contains many monuments, one being to Vancouver, the voyager, who was buried there in 1798. There, too, lie the Misses Agnes and Mary Berry (1852), Walpole's correspondents, and Mortimer Collins. The village consists mainly of handsome old houses. Petersham Lodge was built, from a design by Lord Burlington, for the First Earl of Harrington, on the site of the house (burned down in 1720) erected by Lawrence, Earl of Rochester, Lord Treasurer, *temp.* James II. The manor, supposed to be the Patricea of Domesday, belonged to Chertsey Abbey, until Abbot Thomas conveyed it to Henry V. It has, for a long while, been the property of the Tollemaches, Earls of Dysart.

**Old Houses in Gray's Inn.**  
WE notice that the brickwork of some of the houses on the east side of each of the two squares is being cleaned, repaired, and re-pointed. In South-square, formerly Holborn-court, Nos. 2 and 3, have over their doorways "T. W. A., 1738"; over the doorways of Nos. 1 and 4 are "T. J. W., 1759," and "T. E. B., 1750," respectively; the doorways throughout the two squares are after one design. Gray's Inn-square was formerly divided by a middle row of chambers into Middle, afterwards Chapel-court, and Coney, or Cony-court; the greater part of Cony-court was consumed by fire in 1683-4, and rebuilt in three years afterwards. The middle row of chambers had been pulled down before Strype wrote his edition of Stow's Survey, published in 1720. "Cony Co." and "Holb. Co." are plotted in

J. Evans's map of London, to a scale of 8 in. to one mile, published on January 1, 1799, but we have the authority of Mr. Douthwaite, librarian to the Society of Gray's Inn, for saying that by an order of June 7, 1793, it was decreed that Coney and Chapel courts should be named "Gray's Inn-square." Field-court is so called from the adjacent Red Lion Fields, at one time the principal entrance to the Inn gardens was through Field-court by a gate, since removed, at the north end of Fulwood's-rents.

The Paris Exhibition.

THE Department of Public Instruction in France is spending something over half a million francs in connexion with the exhibition of 1900. The exhibits of this Department will include various laboratories of zoology and meteorology, as well as the results of the excavations in Persia and Chaldaea, and also a historical museum. The Department of Fine Arts will take a much more important part in the exhibition, and its expenditure will amount to 2,500,000 francs. This sum will be expended on architectural models, examples of decoration, stained windows, &c., as well as special exhibitions of the productions of the Sèvres manufactory of porcelain and the Gobelins manufactory of tapestries. The objects found in the ruins of Timagad, in Africa, will also occupy a special pavilion. The exhibitions of these and the other various Government Departments will altogether cause an expenditure of nine million francs.

Society of Painters in Water Colours.

THE present exhibition offers one point of special interest in the small loan collection of drawings by the late Mr. Boyce, who long before his death had ceased to exhibit, and whose works are therefore little known to the younger generation of visitors. The eleven drawings to be seen at the end of the room include some of his finest work, and illustrate the unusual combination which he showed of the most careful and finished treatment of buildings along with a peculiarly delicate rendering of sky and distance. "Where stood Bridewell Hospital" (211), "Old Tower, Venice" (215), and "Church and Ancient House at Ludlow" (218) are among the best, and should afford a lesson to some of the more modern painters of architecture who exhibit. In two cases St. Paul's (as usual) suffers severely at the hands of the artist; even Mr. Goodwin, in "A City Sunset" (43), contrives to distort the dome and spoil the outline of the towers, which besides are too far from the dome; and in Mr. S. J. Hodson's "St. Paul's from Fleet-street" one of the towers seems to have been unaccountably forgotten, and the lines of the dome are all out of perspective. In Mr. Goodwin's "Canterbury" (146), a charming little picture in the main, the celebrated tower, seen rising above the houses, is too thin in its proportions. "Christchurch" (170) by the same artist, a portion of the church seen by twilight and "lamp-lit from the inner," is a fine work, and "Thun" (128) shows delicate and careful treatment of the foreground architecture. His "Hastings" (148) is noteworthy for a most beautifully painted bit of sea. Among architectural subjects Mr. Rooke shows a powerful and highly finished drawing of "Nôtre Dame, Poitiers" (10), more of an architectural drawing in fact than a picture,\* but of

first-rate quality as such. Among the landscapes there is perhaps no work of the highest order, but an unusually high general average, and it would be impossible to name all those which are worth looking at. There seems rather an increasing tendency towards broad effects and the study of colour rather than detail; Mr. Phillip's best work, for instance, "Mountain and Moor" (164) is a large sketch rather than a picture, but very powerful as such. We see the same tendency in Mr. Melville's "A Rosy City" (3) and in Miss Barton's "Bedtime" (11), landscape and cottages in evening light; and Mr. Eyre Walker is becoming less precise and more suggestive in his treatment of landscape, though his most sketchy work, "Stranded on an Essex Shore" (119), is a remarkable example of the poetry of desolation in landscape. This tendency to breadth of treatment is perhaps rather a wholesome contrast to the beautiful but rather artificial effects of such a painter as Mr. Tom Lloyd—perfect in their way, but looking like nature cooked, after a special recipe. Among the other landscapes that may be specially named are Mr. Herbert Marshall's "Rye" (28), Miss Butler's "The Light of the Lilies" (33), a very original little work; two or three drawings of Mr. Birket Foster which are exquisitely pretty cabinet art; the one work by Mrs. Allingham, "Old Farm, Pinner" (82), and Mr. Waterlow's "Evening in the Meadows" (301). Among figure subjects—never very numerous in this exhibition—Mr. Hughes exhibits three large-sized chalk studies, all good in their way (though the one entitled "Rosalind" is far indeed from realising Shakespeare's Rosalind), and a very pretty life-size head, "A Study" (54); Mr. Clausen has a drawing of two ghosts threshing corn (24); Miss Phillott's head of "A Cottage Child" (7) is very pretty, and Mr. Marsh and Sir F. Powell each contribute an excellent study of a figure of everyday life; the former a picture of a lady reclined under sandbanks, reading, "By the Sea" (109), the latter a very carefully-studied figure of a "cheap tripper" kind of girl contemplating her own "Reflection" (126) in a still pool of seawater. As to the figure subjects of Mr. Henshall and Mr. Glindoni, and the mild diableries of Mr. Brewtnall, the Society would be better without them. Mr. Bulleid's quasi-antique figures continue to be pretty, but they do not get beyond that.

Minor Exhibitions in London.

At the Goupil Gallery there is a double exhibition of Japanese prints and Rookwood pottery. As to the prints, they are a valuable collection to those who wish to study various methods and dates in this class of Japanese work; to regard them as of artistic value in a serious sense is only a pose of the present day, as Dutch tulips were in the last century. The Rookwood pottery is stated to have been the first indigenous art product of the United States; the manufactory has now been in work for nearly a quarter of a century, and the articles on view at the Gallery show its present level of achievement, and are of the greatest merit both in regard to form, colour, and delicacy and piquancy of decoration; vigour and force of effect there is not, but in every other quality the work is beautiful. Messrs. Tooth & Sons have added to their winter exhibition a small collection of water-colours by Mr. Birket Foster, illustrating "places of interest in Scotland"; some of these, such as "Hawthornden"

and "Roslin Castle," are the perfection of pretty delicate landscape of the vignette type; others are very weak—see "Tantallon," for instance, with the conventionally touched-up rocks in the foreground; and none convey anything of the real feeling of Scottish scenery. At Messrs. Dowdeswell's Mr. Hyde's black and white sketches, made a illustrations to Mr. Geo. Meredith's poems are very fine and bold, and include some very powerful landscape effects; we may compliment him on showing us for once an artist's sketch of St. Paul's (No. 59) which is carefully studied and accurate in proportion and drawing.

Views in Morocco.

At the Society of Fine Arts Gallery there is a collection of paintings of Southern Morocco and the Atlas Mountains, by Mr. Tom Robertson, which takes us into a rather new region of landscape-painting, where the principal constituents of the scenery are apparently sand and blue water, with only the distinction between sand in flat expanses and sand in mounds or hills; at least that is the impression produced by the paintings, which are very slight in handling, and hardly convince us that they form an adequate representation of the reality. Two or three of the views include curious relics of architecture, "saint-houses" or tombs, which are of some interest.

Minor Exhibitions in Paris.

Two interesting exhibitions are open in Paris. One, at the establishment of M. Hessel, 13, Rue Laffite, consists of drawings, pastels, and etchings by M. Georges Jeannot, the painter of military subjects. This will remain open till December 15. At the Gallery of M. Bing, Rue Provence, another painter, M. Raffaelli, who excels in the portrayal of types of the French middle classes, has collected a number of etchings and dry-points of studies which show great originality and perception of character, as well as a very free broad style in etching.

VENICE.\*

CENTURIES ago, when the Christian era had but lately dawned on the darkness of Paganism, there lay on the eastern seaboard of the plains of Lombardy a desolate tract, half land, half sea, where the waters of the Piave, the Adige, the Padus, and many other rivers emptied themselves into the Adriatic—a long, marshy waste, averaging from three to five miles in width, with sand banks against the sea, and divided by it into long, narrow islets and with a deposit of mud between, cut into numerous channels by the deltas of the streams, and from which the sea never went back—a region which invited none, but where the refugee might make his home and welcome, safe and free from the bands of conquering tribes.

Such was the desolate coast line north of the Padus in the fifth century, when the Goths under Alaric and the Huns under Attila came down upon the cities and gardens of Lombardy and looted and burned, and spoiled. They reached Padua, but the inhabitants who could escape fled away towards the sea, and took shelter on the wild lagoons, as they were called. An island where the channels were deep enough to admit of Greek and Roman vessels of considerable burden was chosen as a centre and called the Isola del Rialto, or the "Island of the Deep Stream." This became the port of Padua, and on it a few rude buildings were erected, and in 421 a church on the traditional site of St. Mark's—probably a humble building in the Late Roman or Basilican style.

\* A Paper read before the Bristol Society of Architects, November 14, by Mr. Mowbray A. Green, A.R.I.B.A. A number of illustrations of Venice, selected to accompany this paper, will be found among our lithograph plates of this issue.





Two Capitals, St. Mark's, Venice.

In 593 the Lombards took Padua, and the inhabitants, fleeing again, joined their ancestors in the lagunes, chose Torcello as their home, and called it the "Port of the Deserted City." Hither, too, at a later period came refugees from Altino and Aquileia and in the seventh century the see of Altino was transferred to Torcello. From now to the eleventh century Torcello was in its zenith with nobility, senate and a distinct government, and in a field stands the stone chair on which the *podesta* or chief ruler probably used to be enthroned, but which tradition, with a touch of irony, has called the throne of Attila.

Its famed cathedral, of great simplicity, was built in the eleventh century by the Bishop Orso Orseolo, son of the Doge. The windows of it, closed with stone shutters (but now also glazed), a low screen enclosure of marble raised a little above the nave for the singers, and the pulpit with its severe sculpture, all yet remain, but the greatest interest attaches to the apse with its marble seat for the clergy and the throne for the episcopos, carried round the apse except where the flight of steps to the throne breaks the continuity of the curve: probably the most complete as also the most ancient in existence. But Torcello went to decay in that same century and, although from the summit of the rudely-built brick campanile the eye rests upon the same far off scene of natural splendour as when the struggling people were rising to prosperity, yet at one's feet there lies the deserted quay, the grass grown piazza, the desolation of a dead city.

Before returning to the Isola del Rialto we must give our attention for a moment to another important island which lay about a mile to the north of and was larger than the Rialto, indeed the largest in the lagunes. Murano, founded early, at first independent of, but afterwards a dependency of, Venice, became so important that it was raised to a separate municipality and had its own *Podesta*.

The cathedral of St. Donato, Murano (see lithograph), basilican in plan, was founded in the ninth century, but rebuilt in 1111. The walls are chiefly of a dark yellow, and the decorative part of a deep red brick. Internally it is very beautiful. Stalls run round the apse, and the mosaics, pavements, and columns of Greek marble are not unworthy to be compared with those of St. Mark's, with which church, together with Torcello and some of the Palaces, it forms a group of some of the most notable Byzantine work in and around Venice.

To return to the Rialto, which now began to form the nucleus of a town, and where houses and bridges were fast rising from the lagune. Before the final fall of Padua the emigrants to the Rialto had at first received their rule from the Mother City, but when she fell and the refugees, as we have seen, joined those who had fled before, each of the twenty-four principal islands elected a tribune, and these met on certain days for consultation, and held a *concilio* or general assembly of the people on important occasions. But 200 or 300 years sufficed to occasion differences among the tribunes and strife among the people, all threatening civil war, whilst foreign enemies, drawn by the increase of the colony, strove to attack the island city. A strong government was needed, and at a *concilio* held in 607 Paul Luke Anafesto was chosen the first governor, under the title of Doge, or Duke. He was to appoint the tribunes and judges, administer justice to clergy and people, and was himself to be the highest tribunal of appeal. He was chosen for life, with power over the revenue and to convoke the general assemblies. His administration was powerful and good, and he added to the territory of the islands a strip of the mainland. His proud successor was put to death by the people, and the assembly, dissatisfied with the Doge's rule for life, resolved in 737 to elect a magistrate for five years, who should be called *Maestro della Milizia* or Master of the Militia, and the seat of government was removed from the island of Heraclea to Malamocco. But the new Government was not favoured by the people, and after the reign of the fifth master the office of Doge was restored, only to exhibit afresh the hard mastery of the Doge on the one hand, and the rebellion of the people on the other, ending by the deposition of the Doge, who was often punished with the loss of his sight. Thus passed nine rulers, until in 809 the Doge Angelo Participazio became the real father of the State and founder of the metropolis; he restored peace, made the Rialto the seat of government, founded the Ducal Palace, and connected the groups of islets by numerous bridges. The people had been the Veneti; henceforth Venice should be its name.

About the year 828, so the story goes, it happened that some ships from Venice were trading at Alexandria, and the captains hearing that the church containing the body of the Evangelist Mark was about to be destroyed, and remembering the tradition that when alive

he had visited Aquileia and other Venetian isles, obtained leave to become possessors of the body, a difficult enough task as the relic was highly prized, so they were compelled to carry it off to the ship in a large basket covered with herbs and with joints of pork, hateful to every Mussulman. Landed safely at Venice there was great rejoicing, the evangelist became the patron saint, and the winged lion was stamped on their coins and painted on their banners. Having traced the origin and foundation of Venice thus far let us now see the progress of their early buildings.

The basilica which is said to have received the body of the evangelist had been built scarcely 150 years before it was destroyed by fire, and in 977 a new building was begun, it is supposed, by Byzantine workmen. Nearly a hundred years later it is said that the outer shell only was finished, and it was not till the beginning of the thirteenth century that even the Byzantine parts were completed, and the Gothic a century later.

When we emerge upon the upper end of the wide, open Piazza, glowing with sunshine, but with deep recesses on either side, the Procuratie Vecchie on the north and the Procuratie Nuove on the south, the great tower of the Campanile in the distance, and beyond, the brilliant façade of St. Mark's, it is indeed a striking scene.

Before the Duomo rise the three red flag-staffs of cedar, set in magnificent pedestals of bronze, wrought by Leopardi in 1505, and from whence floated the gold and silk banners of the three possessions of the republic, Candia, Cyprus, and the Morea. Two of the large entrance-doors are of the ninth, two of the thirteenth, and one of the beginning of the fourteenth century. The bronze horses are supposed to be of Roman workmanship of the first century. Constantine took them to Constantinople, and thence the Doge Dandolo conveyed them to Venice in 1204. In 1707 Napoleon I. carried them to Paris, but in 1815 they were brought back to their old place. We may specially notice also the northern door of the west façade, with a mosaic of the exterior of the church, executed about the twelfth century, a bronze door of 1300, the Arabian door on the north side, with its rich archivolt, and the view of the south-west angle of the basilica from the Piazzetta.

To pass to the interior. Along the whole front of the church there runs the atrium or narthex for the catechumens or new converts, who as such, were not permitted at once to enter



the church. The vaulting is entirely covered with mosaics, some of the twelfth century, and shows subjects from the Old Testament. At the south end we enter the baptistery, vaulted with cupolas; near the window is the tomb of the Doge Andria Dandolo, who died in 1354, the writer of the Venetian annals, and the last doge to be buried in the church. The figure on the bronze font is that of John the Baptist, and the font itself has fine bas-reliefs. From here we pass into the church, which seems at first to be filled with gloom. It is a Greek cross, with a central dome and four smaller ones round it, and a great apse at the east end, with a smaller one on either side. There are massive piers and columns and deep recesses, but the light comes so feebly through the windows that the forms are at first not visible. It is a mighty building, 86 yds. long and 70 yds. wide, filled with marbles and mosaics—mosaics from arch to arch and dome to dome, marbles from column to column and pier to pier, the walls incased with it, the floor covered with it. Venice had, indeed, laid under tribute the richest of treasures for her church, a church which was not, after all, the Duomo, but the chapel of the Ducal Palace. Two amboes of coloured marble stand on either side of the screen, intended for the reading of the gospel and epistle; then there is the pala d'Oro or altarpiece of enamelled work, with jewels wrought on plates of gold and silver, executed in 1105, and originally intended for the front of the altar; the great rose window of the south transept; the treasury, the crypt, the details of the mosaic, executed chiefly in the twelfth and sixteenth century, the pavement, and much more there is to see. But we must hasten on.

Turning out of the Piazza and towards the sea we walk through the Piazzetta, on the left side of which is the Ducal Palace, on the right St. Mark's Library, and at the end the two granite columns from Constantinople crowned by the statue of St. Theodore and the emblem of St. Mark—the winged lion; between these columns was the place of execution. We are now in the Riva dei Schiavoni, paved with slabs of unpolished marble, and at the south side of the Ducal Palace looking toward the island of St. George. From the sea called the Basin of St. Mark the group of buildings are seen best, the Prigioni (or prisons) on the right, the Bridge of Straw, the Ducal Palace, the columns, the Library of St. Mark, and the Zecca or mint. The prisons were built in 1589 to replace the unhealthy cells of the Ducal Palace. The Library of St. Mark was built by Sansovino in 1536 to contain the bequest of Petrarch, and the Zecca was built by the same architect at the same time.

Landing again near the prisons and passing over the Ponte della Paglia or Bridge of Straw, we are at the oldest portion of the palace, here connected with the prisons by the Bridge of Sighs. Before examining the Palace further, let us for a little look at the history of the life of the city so closely connected with this building and, here I must ask your indulgence lest I seem to be tedious. In the eleventh century, the State, acquiring great privileges, entered into friendship with the Greeks and was associated with them in the Crusades. In 1098 their first fleet, headed by the Doge Vitali Michieli, numbered over 200 ships, and four years later Ordelafo Faliero obtained from Baldwin the grant of a fourth part of the city of Acre and free commerce throughout his kingdom of Jerusalem. This next doge but one acquired further dominions in Palestine and striking privileges were granted to residents from Venice. In 1125 he returned home with honours, bringing with him the two columns which we have seen and a third lost in landing. But Constantinople became jealous of Venice and displeased at her assistance given to the Latins. War ensued, Venice being worsted, but in 1203 the fourth Crusade assembled at Venice, and led by the old blind Doge Dandolo, who had persuaded them to let him take the head, landed at Constantinople and commenced a successful attack, but it was not till the second expedition of 1205 that Venice triumphed fully, and the Byzantine Empire fell. Much spoil was brought back, and the four gilt-bronze horses, Venice had secured the Peloponnese; Euboea, Andros, Egina, Salamis, and other Islands of the Ægean; Sexos and Abydos on the Dardanelles; some towns in Thrace; the Ionian Isles; the coasts of Epirus and Acarnania, the province of Durazzo, and Crete. On his return Dandolo was allowed, amongst other honours, to take the title of

Despot of Romania and Lord of a quarter of one-eighth of the Roman Empire.

Thus the Crusades gave an impetus to Venice, and also the power to acquire treasure from foreign lands, and not only so, for the minds of the people became filled with a taste for Eastern art, while their merchants were continually bringing home rich marbles and precious things, and so little thought did they come to have for anything but the acquirement of treasure that it has been said of them that they were reduced to purchase the luxuries of Asia by supplying the slave market of the Saracens. Meanwhile, there had been certain changes in the government, for two assessors had been appointed to the doge, and in 1094 a supreme court of three, "Judges of the Palace" as they were called, took the power of final appeal out of his hands. Still further, in 1172, there was practically a revolution of the government, for the power of choosing the doge was given into the hands of eleven men chosen from a great council of 470 or 480 persons. A Senate also was chosen from the Grand Council, and four assessors added to the two spoken of above; these afterwards became "La Signoria," and from these proceeded the legislature. The ruling power was fast becoming an aristocracy.

It was during the reign of the Doge Ziani that the Emperor of Germany, Barbarossa, after persecuting the Pope Alexander III., was at length compelled to ask for peace in the city where the Pope had before taken refuge and humiliated himself before the Doge at the portico of St. Mark's. In return for the protection given him during his exile, the State was allowed by Rome to attach a seal of lead instead of wax to all State documents, in the same way that Rome did. Under the second Ziani, Venice was at war with Genoa, and the ten years' naval war ensued, in which Venice, with her fleet broken, was compelled to make peace with Paleologus of Constantinople. It was this Ziani that repaired and enlarged the Byzantine Ducal Palace, which was afterwards merged into the Gothic, and who laid out the Piazza of St. Mark. The elective power of the people and the ruling power of the doge were now fast slipping away, and when the people tried to elect the doge, the Grand Council compelled him of their choice to leave Venice and put Pietro Gradenigo in his place, a man chief of the aristocratic party, who, on February 28, 1297, brought up the famous decree called *Serrata del Maggior Consiglio*, or Shutting of the Grand Council, and founded the hereditary aristocracy, an immovable, terrible, revengeful, indulgent tribunal, which yet was impartial in justice and beloved by the people, but dreaded by the nobles. This event is most important as drawing the line between the first 600 years of the existence of Venice, when doge and people had a share in and influence upon the government, and the next 500 years, when the nobles took the reins of government absolutely into their own hands with the doge as but a figure-head. Conspiracies, however, followed, notably that of Tiepolo, which led to direct reforms. The well-known Council of Ten was formed, appointed first for a few days, but eventually in 1335 declared to be permanent with many additional powers. They had absolute control over every man in the State, and were held free from all responsibility. They wore black robes of office and were called *I Neri*, "the Black," and to them were afterwards added the *Seignory*, as assessors, called, for a similar reason, *I Rossi*, "the Red." About this time the city received great adornment from its commercial prosperity, but the fourteenth century is chiefly memorable for the notorious plot of Marino Faliero, who, tired of wearing the ducal cap without the ducal power, determined to boldly overthrow the Government and massacre the nobility of which he was himself the nominal head. But the conspiracy was discovered on the day before that on which it should have been carried out, the conspirators were put to death, and Marino Faliero was beheaded at the top of the staircase—where he had been crowned. Among the ducal portraits in the Sala del Maggior Consiglio there is an empty frame and this inscription, "Hic esset locus Marini Falieri decapitati pro criminebus."

The end of the fourteenth and the beginning of the fifteenth centuries are marked by the Genoese war, the loss of Chioggia, and its recovery by the brave Admirals Vittor Pisani and Carlo Zeno, and the wisdom of the Doge Tomaso Mocenigo, who only reigned a few years. The reign of his successor, Francesco

Foscari, was sadly ended by his deposition by the Council of Ten, and he died a few days afterwards.

Venice was now the possessor of all the coast from the estuary of the Po to the island of Corfu, and her revenues were enormous. Palaces were built, treasure was amassed, the arts were flourishing. The art of glass making and glass engraving in Murano was revived and brought to great perfection, and a little later printing flourished, especially under the skill of Aldus Manutius, who invented the italic type. The chief painters of the period were Giovanni, Antonio and Bartolommeo Vivarini (known as the Muranese), Antonello da Messina (a stranger who introduced painting in oils), Jacopo Bellini and his sons John and Gentile, and Vittore Carpaccio. It was the zenith of her power; but her decline was at hand. Constantinople was captured by the Turks in the middle of the fifteenth century, and her Eastern power was enfeebled, but the discovery of America and the new sea route to India, thereby diverting her commerce to the Portuguese, was the blow that made itself most powerfully felt.

In 1454 the Inquisition of State was introduced. There were three members of the Council of Ten and one of the Council of the Doge. The authority of the Ten was transferred to them and the State was put under the ban of an awful, invisible, irresponsible system of espionage. The lion's mouth in the Ducal Palace was open to receive accusations, true and false, and men dared not to speak a word against their government under pain of almost instant death. In 1508 the league of Cambray, formed by the Pope, the Emperor, and the kings of France and Arragon against Venice, began to press heavily upon her, but she partially recovered. Gradually, however, her decline came on, until in 1797 Napoleon took the city, and thus fell one of the proudest, most ambitious, wealthy, and licentious cities in the world. It should be here noted that Ruskin dates the commencement of her fall not from the middle of the fifteenth century, but from the death of the Doge Tomaso Mocenigo in 1423.

To return to the Ducal Palace. We are now at the south-east angle on the Riva degli Schiavoni, and from here to the seventh main arch inclusive, on the Piazzetta side, is the work of the early part of the fourteenth century, begun in 1301 under the Doge Gradenigo; thus, be it noted, the Gothic Palace commences with the rise of the aristocracy to power. This part is said to have been built by Bartolommeo and Pantaleone Buon. From the seventh arch to the Porta della Carta is of the fifteenth century, built at the instance of the Doge Mocenigo and in the reign of his successor, Foscari; most of the capitals are copied from the earlier work. There are thirty-six columns below, seventy-one above. The sculpture above the capital at the angle of the Piazzetta and the Riva represents the Fall of Man, and that by the Porta della Carta, the Judgment of Solomon; the latter is under Renaissance influence and is of inferior workmanship.

We have seen that the Byzantine Palace of Ziani had been merged in the Gothic, but the Renaissance one was only grafted on to the Gothic, so that at this day the two latter remain as one palace, the character gradually changing from the seventh arch to the Renaissance Cortile, this change being seen more in the details than in the main design.

Passing through the Porta della Carta, so called because the decrees of the State were posted there, and in which we see a strong Renaissance tendency, we come to the Cortile begun at the end of the fifteenth century by Bregno and Scarpagnino. The east facade is entirely finished. Notice the well top of bronze, of which there are two in the Court, and the Giant's Staircase leading to the interior of the palace, with the colossal figures of Mars and Neptune executed by Sansovino in 1554. The old staircase on which the doges used to be crowned, and where Marino Faliero met his death, was at the southern end of the same facade. The detail is that of one of the windows on the second floor. Inside, on the first floor, is the Sala del Maggior Consiglio, or hall of the Grand Council, where the Nobili, whose names were written in the "Golden Book," sat; the portraits of seventy-six doges, beginning in 810, are painted on the frieze. Tintoretto's "Paradise" is on the east wall, and there are many historical pictures round the room. The Sala del Scrutinio, or voting hall is on this floor also, and here the portraits



of the doges down to Ludovico Manin (1797) are continued. The Library of St. Mark is in this part of the building. Above are many halls, notably the Sala della Bussola, once the ante-chamber of the three inquisitors, and by the entrance to which was the lion's mouth; the Sala del Senato, where sat the Council of Ten, the inquisitors, the procurators of St. Mark and others, all presided over by the doge; and the Sala del Collegio, where ambassadors were received.

From the Hall of the Council of Ten is a staircase winding up to the roof, where were the piombi, or leads, and where prisoners were confined. Under the palace are the pozzii, or dungeons, fearful places of confinement. On the east side is the passage leading to the Bridge of Sighs, on the farther side of which are the prisons which have replaced the old pozzii, where prisoners are no longer confined.

Much of the splendour of the ancient palace still remains.

Turning into the Piazza again, we may just notice the Campanile of St. Mark's, begun in 902, and completed by the belfry in 1510. It is 323 ft. high, and a magnificent view of the city is seen from it. At the north-west angle of St. Mark's is the Clock Tower built by Lombardo in 1496, and on the north wall of the church are many marble Byzantine reliefs. The Procuratie Vecchie were built in 1517 to accommodate the procurators of St. Mark's, the highest officials next to the doge. The Procuratie Nuove are of the latter part of the same century.

The principal church of Venice next to St. Mark's is the Frari (see lithograph), a Gothic building under Italian influence, such, for example, as is seen in the twelve circular buttresses. It was begun before the middle of the thirteenth century, and completed before 1338, by Niccolò Pisano. It contains the tombs of many eminent citizens. The pillars of the nave are circular and massive, with pointed arches over. In the choir on the right is the tomb of the Doge Foscarini, 1457, a mingling of Gothic and Renaissance, not good, and on the left that of the Doge Niccolò Tron. Titian and Canova are buried here. The choir stalls are by Marco da Vicenza, 1468. The monastery adjoining this church contains the finest collection of archives in the world. They number about fourteen million documents, dating from 883.

The church of S. Stefano is of the fourteenth century, with a brick façade and terra cotta window mouldings.

The church of SS. Giovanni e Paolo (see lithograph) was begun before the church of the Frari, and under the influence of Pisano, but not finished till 1430. It has an unadorned brick façade, Gothic in style; it has in the interior ten circular columns and a dome. The doges are mostly buried here, and in the choir is the tomb of the Doge Mocenigo, by a Florentine, sculptured in 1424; one of the last good pieces of Gothic work, with very slight Renaissance influence. In the south transept is a fifteenth century window, a somewhat rare thing in Venice. The east end is apsidal. This church contained the great work of Titian, the "Death of Peter Martyr," unhappily destroyed by fire in 1867. Near here is the school of St. Mark, with a fine façade built by the Lombardi in 1485. Upon it are sculptured reliefs in perspective, two lions, and the achievements of St. Mark. These schools, in Venice, were composed principally of laymen under the control of the church, and were founded for benevolent purposes, being voluntarily supported.

In the square is the bronze figure, on horseback, of Bart. Colleoni, General of the State, who died in 1475, and is buried at Bergamo. The statue was modelled by the Florentine sculptor, Verrocchio, and cast by Leonardo, the Venetian, about twenty years after the General's death.

The façade of the church of S. Maria del'Orto illustrates the transition from the late Gothic to the style of the Lombardi. It was built by Pietro Lombardo soon after 1481, and has a flat wooden ceiling inside, supported by columns. Tintoretto is buried here. About this time was begun the church of the Miracoli, finished seven years later, an early Renaissance building also under the influence of Lombardo. It is incrustured with marble on two of its façades and internally throughout. The choir is quadrangular with a dome, and there are ambones right and left for the reading of the epistle and gospel as in the old Christian churches. As it has coffered-barrel vaulting we may take it that the doubtful artistic taste

of a great circular pediment is, at least, honest. The church of S. Zaccario, of ancient origin, but rebuilt by Martino Lombardo in 1457, has somewhat of a Gothic feeling in the choir. The nave has round arches on Corinthian columns. The façade partakes of the Lombardi type, and in general effect is good. The church of S. Sebastiano contains the tomb of Paul Veronese. The church of St. George of the Greeks has a good Renaissance campanile of the middle of the sixteenth century. Following on these in order of date are some of the churches built by Palladio. The chief is that of S. Giorgio Maggiore on an island opposite the Piazzetta. It was begun by Palladio in 1560, and finished by Scamozzi in 1575. It is cruciform with a dome and apsidal end to the transepts. Il Redentore (the Church of the Redeemer) was built by Palladio on the island of Giudecca, after the cessation of the plague in 1576. A successor of Palladio, Longhena, built the church of S. Maria della Salute, where the eastern end of the Grand Canal opens into the wide waters of the lagoon. It is erected on piles, and was built in 1631-82 in memory of the ceasing of the plague of 1630. The Church of S. Pietro di Castelli was in the seventeenth and eighteenth centuries the cathedral church, but in 1807 St. Mark's took its place.

The Grand Canal, the great waterway of Venice, has its banks, as no doubt you know, adorned with many palaces and houses. It is nearly two miles long, and averages 33 yds. to 66 yds. in width. The pali or posts in front of the palaces were formerly the distinguishing marks of the dwellings of the nobles, and still remain so to a certain extent. Upon them are painted the heraldic colours of the owners. Philip Comines, an ambassador of Charles VIII. of France, who was honourably entertained on his entrance into the city, thus describes it as he saw it in the fifteenth century: "Sure, in my opinion," he says, "it is the goodliest street in the world, and the best built, and reacheth in length from one end of the town to the other. Their buildings are high and stately, and all in fine stone. The ancient houses be all painted, but the rest, that have been built within these hundred years, have their fronts all of white marble, brought hither out of Istria, a hundred miles thence, and are beautified with many great pieces of porphyry and serpentine. In the most part of them are at the least two chambers, the ceiling whereof is gilded, the mantle trees of the chimneys very rich—to wit, of gilded marble, the bedsteads with gold, and the presses painted and varnished with gold, and marvelously well furnished with stuff. To be short, it is the most triumphant city that ever I saw, and where ambassadors and strangers are most honourably entertained." One of the oldest buildings on the canal is the Fondaco de'Turchi (see lithograph), Romanesque of the tenth century, afterwards (in the seventeenth century) used as a dépôt for Turkish merchandise. It is now the Museo Civico. The palace of the Contarini-Fasan, opposite della Salute, is in the pointed Gothic of the fourteenth century. Though a very small house, the work is beautiful, and it is one of the chief ornaments of the best part of the canal. The kind in Venice. The Frascada Palace belongs to the end of the same century, and is in the same style as before. In the background is a part of the school of St. Rocco, of the early Renaissance, where is Tintoretto's masterpiece of the "Crucifixion," painted in 1565. The Ariani Palace, somewhat of the Ca d'Oro type, once belonged to a patrician family who were excluded from the Grand Council towards the end of the century. The Ca d'Oro (rather Doro) belongs to a distinct class of palace, characteristic of the doges, and possessing a large entrance colonnade, a loggia on the upper floor with a number of windows placed close together in the middle, and an abundant use of decoration and colour. Notice the almost universal use of square balustrades in Venice, often filled in, not with balustrades as generally used, but with little plain columns of a Romanesque type; the Venetian baluster proper we shall see later on. The date of the Ca d'Oro is 1424-30, and it belonged to the Contarini family, who trusted the building of it to John and Bart. Buon. A year afterwards the marble was painted and gilded by a Frenchman, whence its name, House of Gold. A little later, and of the same type, is the Foscarini Palace, where lived and died the Doge Jacopo Foscarini, after a reign of trouble,

ending in his deposition. The top story was added by him. The Palazzo Cavalli, a good building, founded on the Ducal Palace, dates from about 1380. There are fine crests, heads of sea-horses, inserted on either side of the entrance door. The Contarini degli Scignini is of the fifteenth century, on the Trovaso Canal, turning out of the Grand Canal. Notice the Venetian chimneys. The Dario Palace is in the style of the Lombardi, and was built at the close of the fifteenth century by one Giovanni Dario, a Venetian, as would appear from the inscription, "Genio Urbis Ioannes Darius." It is greatly adorned with coloured marbles.

We now pass to the Renaissance palaces proper. Of these the Vendramin, in the early style, is a good piece of work by Pietro Lombardo, dating from 1481. The motto on the exterior is "Non Nobis." The interior is magnificently adorned. Mr. Ruskin speaks of the Renaissance in Venice as based in order of merit (1) on Byzantine work, (2) upon Gothic, (3) upon itself. This palace would seem to have had its *motif* from the Gothic. The Palazzo Contarini della Figure, 1504-64, belongs to the early school of Renaissance, and derives its name from shields and trophies hung on the wall. Very similar to this is the Capello Palace, built by the patricians of that name. Its façade was originally adorned with frescoes by Paul Veronese. These two last palaces show an influence from the school of the Lombardi. The Cierloghi Palace, situated near the Ponte Rialto, is of the Early Renaissance style, and is attributed to William Bergamasco, 1525. It was once the residence of the three State officers who administered the public expenses. In the distance on the left are the Fabrice Vecchie or the Old Buildings, used as public offices, and built by Scarpagnino, 1520-22. The Zen Palace is from designs by Sebastiano Serlio, 1531.

The Grimani (see lithograph) is the masterpiece of San Micheli, 1595. The Doge Grimani lived here, and here the Dogressa Morosini was crowned in 1597. It is now the court of appeal. Ruskin considers it the best piece of Middle Renaissance in Venice. The orders are all Corinthian, but the lowest one has pilasters instead of columns. Notice that the balcony and cornices run unbroken through the building. The Palazzo Corner-Spinelli, of the sixteenth century, is attributed to Pietro Lombardo and Guglielmo Bergamasco. It is a well-proportioned building, in parts not unlike the Vendramin Palace, but with sterner and more Gothic feeling. Notice the circular balconies and the landing stair, also the delicate contour of the symmetrical baluster, a form very generally used throughout the Renaissance buildings of Venice, with a central necking and a gentle swelling above and below. It is usually widely spaced, and it is remarkable that, so set, the baluster is in no way impoverished, but rather has more dignity. The Papadopoli, or Coccina Palace, is said by some to be by Palladio, but more probably by a pupil of Sansovino, and would date from about the end of the sixteenth century. Pediment heads to the windows are more freely used here. The Pesaro Palace was built by Longhena in the seventeenth century. Its interior is sumptuously adorned. The balcony on the left, but presumably not part of the palace, gives a good instance of the severe treatment of these projections in Venice, and the beautiful line of the corbel stones. The Labia Palace is of the seventeenth century, and belongs to a rather late school, though it will be noticed that this and other buildings in Venice, though even of a later date, do not show such an advanced Rococo feeling as is sometimes seen in other cities. This seems to be mainly due to the keeping of the long unbroken horizontal lines on the façade of the building. Possibly also the fact that many of these buildings have one façade only, and have other buildings closely contiguous to them and in the same straight line, may have kept in check the exuberant spirit of their builders. Again as we cannot but have seen in the Gothic work, in a climate where the sun shines so brightly and casts such depths of shadow from the simple moulding—perhaps even a square one—there would not be the suggestion that new effects might be gained by breaking up the façade into so many portions, and thereby sacrificing breadth of effect to variety of light and shade. There still exist in the interior fine frescoes by Tiepolo, a decorative painter, who died in 1770. The Rezzonico, now the



Browning, Palace (see lithograph), was designed in 1752 by Giorgio Massari, a good architect in his day. It was purchased by the poet Browning, who died there in 1889. The balustrade as used throughout the later Renaissance buildings is here well seen. It is somewhat similar to that of the Corner-Spinelli, but stouter, and of less delicate outline. The mouldings of the balconies are kept as square as possible.

There are many picturesque bridges in Venice, one of the finest, next to the Rialto, being the Bridge of St. Job, crossing the Canareggio Canal. It was built by Tirali in 1688, and very largely restored in 1794. It will have been noticed that nearly all the bridges in Venice are built on a definite design. The arch is segmental, and the line of parapet, instead of following it, is flattened at the top, and thence the sides slope down in a straight line to the point of approach. Thus, seen at the side, it has the appearance of a portion of a circle inscribed within an octagon.

The finest bridge is, of course, the Rialto, situated about midway in the Grand Canal. It was the work of Antonio da Ponte in 1588 or 1591. It joins the two sestieri of St. Mark and the Rialto, a sestiere being one of the administrative districts into which Venice is divided. The marble arch is of 74 ft. span, and is 46 ft. wide, and the abutments are built on 12,000 piles. From the twelfth to the sixteenth centuries the bridge was of wood, and down to 1854 was the only connexion between the east and west quarters of Venice.

The regatta or boat race was famous in Venice once. Some derive the word from "remigata," or stroke of the oars, and some from "riga," a straight line. Records of the races date from the fourteenth century, and royal pageants were witnessed in the fifteenth, sixteenth, and eighteenth centuries. The races are now rowed in gondolini, or small boats shaped like a gondola.

The parts of Venice that lie behind the Grand Canal on either side may be seen on foot as well as in a gondola; and in them and the squares may be found many interesting views and scenes.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### FIREPROOF CONSTRUCTION OF BUILDINGS IN THE UNITED STATES.

THE third General Meeting (Business and Ordinary) of this Institute for the present Session was held on Monday at No. 9, Conduit-street, Regent-street, the President, Professor Atchison, R.A., occupying the chair.

The minutes of the previous meeting having been taken as read, the following candidates for membership were elected:—*As Fellows*: R. Lockhart McCowat, Johannesburg; W. W. Cooper, M.A. Cantab., Diocesan Architect to the Diocese of Grahamstown, Cape Colony; H. T. Hare, London; W. H. Duffield, London. *As Associates*: J. C. Baines, London; C. W. Surrey, London; A. Herbert, Leicester; L. Moore, Woolston, Southampton; P. C. Blow, St. Albans; J. S. Harrison, Leicester; Ethel Mary Charles, London; A. R. Gough, Redland, Bristol; C. Riddey, Wellingborough; V. E. Bösher, St. Leonard's-on-Sea; R. W. Carden, London; A. W. Vercoe, Lee, S.E.; A. Cowie, London; G. McMichael, Birmingham. *As Hon. Associate*: Sir Alexander Binnie.

The following results of the November Examinations were then announced:—

##### The Preliminary.

E. A. Agutter, London; J. M. Alexander, Ashton, Gourock, Scotland; H. W. Amies, London; D. Anderson, Coventry; H. C. Anderson, Leeds; J. L. Armour, Gateshead-upon-Tyne; J. M. Arthur, Airdrie; J. H. Balderstone, Padham, Lancs.; W. C. Barker, Hebden Bridge, Yorks.; C. Batley, Ipswich; R. Bennett, Buxton; Fort Vincent Blacka, Todmorden; L. M. W. Bladen, Stone, Staffs.; A. C. Bossom, London; H. F. Bowen, Brighton; L. A. Box, Cheltenham; J. Boyle, Bolton, Lancs.; F. H. Bramley, Sheffield; S. Bridges, London; H. F. Buckley, Halifax; T. G. Chambers, London; C. P. Chard, Bridgwater; B. C. Chilwell, Wednesbury; G. Church, Warrington; H. F. Clarke, Manchester; E. E. B. Claypole, London; J. S. Collings, London; F. E. Collington, Nottingham; Ethel May Commin, Exeter; J. W. Corking, Gateshead; R. W. A. J. Cosway, Wandsworth; C. M. Crickmer, London; W. T.

Curtis, London; W. R. Davidge, Teddington; A. H. Davies, Newport, Mon.; F. Dyer, Manchester; G. L. Elkington, London; G. F. Ely, Manchester; J. Forbes, Middlesbrough; J. L. Fouracre, Plymouth; F. G. Gardiner, Bath; J. H. Gask, Todmorden; A. R. Gradwell, Blackburn; R. Grant, Oban; A. G. F. M. Hall, Peterborough; F. Haswell, Monkseaton; F. R. B. Haward, Great Yarmouth; W. Hemmings, Bolton; G. W. Hilton, Stoke-on-Trent; A. E. Holbrook, Southsea; A. L. Holder, London; H. J. B. Hoskins, Birmingham; I. A. Hossack, Aberdeen; R. Huggup, jun., Alnwick; M. G. Hussey, Cheltenham; M. Judge, London; H. C. Kellett-Smith, West Kirby; W. J. Kennedy, Edinburgh; A. F. P. Knapp, Walthamstow; P. W. Lacey, Derby; E. P. Laycock, Plymouth; N. A. Leech, Maidenhead; J. M. Lethbridge, Highgate; J. McKissack Glasgow; T. C. Marwick, Edinburgh; A. S. Millar, Reading; J. K. Moore, Walthamstow; H. Moss, Manchester; W. J. Nash, Wellingboro; B. L. Newman, Newport, Mon.; J. Parlett, London; E. H. Payne, Bristol; C. E. Pease, Wimbledon; H. Phibbs, Brierley Hill; B. A. Poulter, Camberley; J. Preece, Cardiff; F. H. Price, Taunton; S. H. Rainforth, Lincoln; W. S. Richmond, Bedford; F. J. Robinson, Bath; T. Salvin, Chesterfield; A. Scott, Glasgow; H. V. Shebbear, Surbiton; C. H. Simpson, Sheffield; J. B. Smith, Bedford; W. C. Smith, London; C. O. Spencer-Smith, London; A. C. Stair, London; C. Stretton, Leicester; L. S. Sullivan, London; A. Symon, London; G. W. Tod, Edinburgh; S. D. Topley, Lewisham; R. J. Tyndall, London; F. G. Walters, London; P. S. Widdup, Blackburn; G. H. Williams, Huddersfield; J. V. Yorke, Tunstall.

##### The Intermediate: In Order of Merit.

T. J. Byrne, Kingston-on-Thames; J. Ewing, Bervick-upon-Tweed; T. F. Green, London; A. W. Papworth, London; A. Holstead, Halifax; R. H. J. Mayhew, Anerley; V. R. Gould, London; A. G. R. Mackenzie, Aberdeen; H. A. Wilson, South Shields; R. E. Hemingway, Nottingham; C. H. Reilly, London; J. E. Spain, Wragby; R. S. Cockrill, Great Yarmouth; R. C. Wrinch, Ipswich; W. G. Trew, London; J. Baird, Prestwick; G. Walker, Barrow-in-Furness; L. U. Grace, London; G. H. Norman, Old Ford; S. Smith, Sheffield; E. W. Banfield, London; C. H. Bressey, London; L. W. Clifton, Winchester; A. E. Hughes, London; J. D. Hunter, London; C. S. Joseph, London; W. G. Milburn, Wimbledon Park; A. E. Pickering, Brockley; E. J. Pullar, London; F. D. Smith, Sydenham; A. K. Tasker, North Shields; H. White, Loughton.

##### The Final.

W. H. Bourne, London; J. Cubbon, Sale, near Manchester; L. W. Green, Datchet; F. R. Hiorns, Margate; J. Kirkland, London; E. F. Knight, London; E. J. Mager, London; H. D. Pearson, Teddington; J. H. A. Phillips, London; G. Reavell, jun., Alnwick; W. A. Scott, Drogheda; V. Steadman, Clifton; H. Tanner, jun., Beckenham; H. I. Triggs, London; J. Wager, Blackheath; A. M. Watson, London.

At the conclusion of the foregoing business, a paper was read, under the management of the Science Standing Committee, by Mr. H. D. Searles-Wood (for Mr. R. W. Gibson, of New York), entitled, "Fireproof Construction of Buildings in the United States," of which the following is an abstract:—

Mr. Gibson's paper commenced with a brief sketch of the development of fireproof construction in the United States, showing that the first efforts had been disappointing through lack of perception of the difference between combustible materials and fireproof materials. The exposed iron systems had failed signally, collapsing to the heat of burning fittings, furniture, and stored goods. The modern system had developed from these experiences upon an ancient pattern of floors composed of wooden beams buried in masonry, using steel and iron instead of wood, and perfecting and systematising fireproof protection. The latest phase was the entire elimination of the combustible materials hitherto used for doors, floors, architraves, &c.; the selection of materials fire-resisting as well as incombustible, and the use of these to protect others which must not be used unless so protected. Materials most available were steel or iron for strain-bearing purposes, and brick or terra-cotta and plaster to clothe and protect the metal. Masonry materials required careful selection, some granites

and marbles being liable to destruction at the earliest blasts of a severe fire. Fireproofing must be such that, when the fire occurs, it will not be washed off by the heavy torrents of water thrown upon it by the modern fire engine. Of the several classes of fireproofing, accumulated experience pointed to the infinite superiority of fire-resisting terra-cotta, which had always performed the duty required of it. Probably 95 per cent. of existing fire-proof work was of terra-cotta construction. The structural iron work might be divided into three classes, suited to as many types of fireproof buildings. First, the building of ten stories or less, erected by the old methods of supporting walls and superimposed columns carrying floors and roof, and with only small beams and girders or occasional independent trusses. Secondly, the building of more than ten stories, which accumulated such strains upon its walls that they must be reinforced by posts to carry the girder loads, and in which the walls required such mass in their lower parts to support their own upper parts that the metal first introduced to support the floor girders was reinforced and called upon to support the upper walls. This was the so-called skeleton construction. At a height exceeding twelve stories, or when exposure to wind and other strains was great even at this height, the ordinary attachment of columns and girders was abandoned, and horizontal stability supplied by the rigid riveting of all connexions of posts one upon the other, and of girders to posts and beams to girders, and by the addition of bracing in ties and struts and gusset brackets, thus developing the so-called cage construction, wherein the steel receives and transmits all loads to the foundations; and the walls have become mere panels, not only without vertical loads, but without transverse bracing strains. Thirdly, an intermediate type of building, where all the internal structure and all the floor loads were supported upon columns, some being placed in the outside walls, the outside walls being made of self-supporting thicknesses in cases where architectural treatment demanded sufficient mass for the purpose, and where the foundation presented no difficulty. In buildings of the third type, erected in many stories and let for business purposes, almost perfect fireproof qualities had been achieved. In such buildings there was no danger to life from fire, or of the fire spreading from the room where it first occurred. This type had become systematised by custom and experience, so that its structure was uniform throughout the country. The floor loads are supported upon columns of rectangular shapes of rolled steel, the outer columns being set in the outer walls in grooves, close-fitting but without bond, so as to permit of unequal movements and settlements and contraction. Girders are of rolled steel, built and riveted for large sizes, and of I-beams for smaller (24 in. and under); they are all riveted to the side columns, so that these may be continued right through the height of the building in practically one length. Bracing is done with gusset plates and angles. Beams supporting the floors are small (8 in. or 9 in.) rolled steel I-beams, laid 4 ft. 6 in. apart. The size of the beam and spacing arise from the use of the terra-cotta arch, of from 8 in. to 10 in. in thickness. These arches, which are very economical, very adaptable, and elastic in their application, are made of hollow terra-cotta blocks, with joints inclined at a fixed angle. The blocks are of three patterns, viz., the springer, which rests on the flanges of the floor-beam; the intermediate blocks, which are all cut to the same inclination, and the key-block, with the sloped joint on both sides. The work is set upon a centring consisting of simple scaffold boards hung 1½ in. below the soffits of the iron beams; upon this centring the arch-blocks are laid, and then jointed and flushed in cement. When the work is set the centring is removed to a new panel, so the work goes on continually. Upon the arches a layer of cinder concrete is deposited, and upon this the finished floor, consisting of paving or tiling, or a composition of a concrete nature, or sleepers and wooden floor. For buildings having floors weighing from 75 lbs. to 95 lbs. dead load per foot, and supporting live loads from 75 lbs. to 150 lbs., the distance between the main girders would be between 14 ft. and 18 ft., which being a convenient size for a single office is also taken as the unit of room width and the space allotted in the outer walls to a pair of windows. The roof is constructed with arches, the same as the floors, except that sometimes



the steel beams are laid to the necessary pitch of about 1 in. to the foot, so as to avoid the weight and expense of filling, which would be necessitated by level beams and arches. The thickness of the walls is about two-thirds that required for walls supporting the floor loads, and they are secured to the metal frame work so as to receive its assistance in resisting horizontal wind pressure. Thicknesses of walls for buildings of varying height and construction were quoted. The thickness necessary to resist the weather is found to be 12 in. at least of brickwork, with terra-cotta interior furring. The furrings are hollow terra-cotta slabs or tiles 2 in. thick, and 16 in. by 8 in., or other convenient sizes, built up against the inside face of the wall and secured with iron where necessary. The interior of the steel frame is protected over all its exposed surfaces by 2 in. of terra-cotta furring. The girders are protected by bars and wiring, and usually getting their outer form by means of metal lath upon light iron bracketing to receive the finished plastering. The lower portion of walls and columns are frequently finished with marble slabs 1 in. thick, or with tiling. Those methods are preferable which place the fireproofing material close to the metal and preserve numerous and frequently broken air spaces in their own substances. A greatly improved and considerably cheaper column protection can be made by using one coat of metal lath and cement in contact with the column, and a second coat furled out from the first upon metal lath upon light iron bars, so as to preserve an air space between the two thicknesses of cement. This protection is finished with hard plaster, proof against the fire-hose. Partitions are built after the structural steel is protected. The best are of terra-cotta blocks, 4 in. thick for average heights, 3 in. for moderate heights, and 6 in. for great heights of story. They may be stiffened with angle iron framing, but show extraordinary strength when well set in Port and cement. Minor partitions, and sometimes all the partitions except those next corridors, are frequently built by using light angle iron posts or quarters covered with metal lath, and plastered either like the old-fashioned wood-plastered partitions, or something with very thin posts and one sheet of metal lathing only, 1/4 in. thick. Three-inch tile partitions dry quicker and cost only a little more. So far the building has nothing combustible in its construction, and the tendency is to more and more reduce the amount of woodwork admitted after this stage. Wooden floors are permitted, but doors and architraves should be of sheet metal, wooden cores being tolerated. Window architraves and jambs should be of hard plaster, and window-frames and sashes of chemically-treated fireproof wood or of metal. Windows in internal partitions and doors should have wired glass. Office furniture should be non-combustible, e.g., metallic book-shelves, desks, cabinets, letter files, &c. In ordinary fireproof buildings, walls, stairs, corridors, and elevator shafts are entirely incombustible. The author next discussed the principal sources of fire, and the manner in which it spreads—the latter a point not little understood, except by firemen; the effect of heat upon metal; an alternative system of steel construction; various forms of doors in use, and the merits of porous terra-cotta, a material preferred by many experts. In conclusion the author dealt at considerable length with the principles to be applied in calculating the strength of beams, girders, columns, and foundations in proportion to the loads required to be borne, quoting the building regulations respecting the matter in New York and Chicago, and the differences of opinion and practice existing among architects. The author's own calculations for a first-class bank and office building designed by him and recently erected in Syracuse were given as follows:—

Load on all beams = total dead load + 70 lb. per ft. live load.  
Load on all girders = total dead load + 60 lb. per ft. live load.  
Load on columns of three upper stories = total dead load + 60 lb. per ft. live load.  
Load on columns of remaining stories = total dead load + 40 lb. per ft. live load.  
Load on foundations = total dead load + 80 lb. per ft. live load.

Among a large number of illustrations to the paper were a set of working drawings and specifications and strain and load diagrams of

the Syracuse bank designed by Mr. Gibson, which afforded an interesting example of this class of practice in the United States. Photographs showing the building in course of erection at various stages were shown by the lantern. A series of lantern slides were also shown reproducing details of construction of a thirty-story building which appeared recently in *Engineering*.

Mr. Percival Gordon Smith remarked that, as Chairman of the Science Committee which initiated this paper, he thought he might claim it as an extremely practical one. He believed that those concerned with the erection of large buildings in England would find in it much that was useful. He did not, of course, pretend to say that they would ever arrive at the time when those twenty or thirty-story buildings would be acceptable in London. The point that occurred to him as being the most difficult was as to the method of controlling these buildings so as to ensure reasonable security. He had himself been trying to master the amended Building Law of New York. He had no good news that the law was under revision. Certainly the Act seemed to him a terrible document. One clause occupied some eight pages, and was so complicated that he could not understand it, and how the Americans did he could not imagine. It was sent over with the paper, though he was not in a position to say whether Mr. Gibson presented it to the Institute. He proposed a vote of thanks to Mr. Gibson for his paper.

Professor W. C. Unwin said he had seen the buildings with which the paper had dealt, and during the World's Exhibition in Chicago he had long conversations with two or three architects who had mainly developed this system of construction. First of all he would point out that the question intended to be dealt with in the paper was not the "sky scrapers" alluded to—they had, strictly speaking, nothing to do with the policy of building vertically instead of horizontally. At the same time it should be pointed out that this class of building was the outcome of the social and business habits among the Americans, of which Englishmen were no judges. One building he saw in Chicago was of fourteen floors, containing something like 100 offices. On a moderate computation something like 7,000 persons would be constantly in that building during business hours. In fact, American business habits seemed to make it very convenient that a large number of persons should be within reach of each other rather than in different buildings or different streets. But quite apart from the policy of high buildings they had the question of iron construction and its strength when masked by masonry or brickwork. In the latest type of the American big building they had absolute steel construction; every particle of strain of that building went directly on the steel structure. The walls were mere panels, and they became thinner as the floors went up. There could be no doubt that this was a system of which we had no example in this country. Yet it had been made successful. The difficulty arising from expansion and contraction of steel. That, however, had been found no serious difficulty at all. True, in Chicago difficulties were encountered which were not met with elsewhere, because such buildings were put on the very worst foundations—even 10 ft. or 12 ft. below the ordinary level of the town. Even from that there were instances of settlements of 4 in.—one settlement was, he believed, as much as 8 in., and there were instances spoken of of 15 in. In general they secured the uniform strength of iron concrete foundations by two fundamental conditions—first, that the pressure per square foot of the foundation should be uniformly distributed and not to exceed 3,000 lbs. or 3,500 lbs. per square foot, and secondly, that in each foundation block resultant pressure should pass from the centre of gravity of the block.

Mr. Lewis Solomon, in seconding the vote of thanks, said he was asked to make an examination of the specification of the building they had heard described by Mr. Gibson. What struck him most was its completeness. A list of all the stanchions and girders was given, there was a complete specification of all electric light work, and of the heating radiator. Going into the details, many things struck him. There was the use of Portland cement in the proportion of 1 to 2 of sand; that in England would be regarded as positive waste. Then the bond

was different from that worked at home. Mr. Gibson specified that the bond was to have two headers every fifth course—a thing that would be very much grumbled at in England. Another thing that struck him was the enormous amount of copper work provided for; that we in England were not used to. Lately there seemed to have been introduced an enormous quantity of copper work, and he might mention the Luxier prisms, where the glass was kept together by a deposit of copper. The flooring, they would find, was mostly ironwork, seven-eighths of an inch thick, which they could not agree to in England. Then the specifications went on to provide for the glass—the best French plate glass in England. They never heard of French plate glass in England. It was either English or Belgian. It was unusual also for them to paint their brickwork, as was provided for in these specifications. In regard to names, too, the Americans used "masonry," where in England would be brickwork; they used the word "chutes" in cases in which we used "shoots"; they talked about vault lights where we should say pavement lights. With regard to the diagram that had been exhibited, there were several useful features in calculating the weights and the strains, the sizes of the girders and other working which was far preferable to our custom of calculating them on paper.

Mr. R. Gifford Read said the paper gave them a very good idea of the American way of building high structures, and showed how different the Americans were from us in their regularity in going to work, and their application of strictly scientific principles. He had had the good fortune to work out the construction for several gentlemen who, he dared say, were members of that Institute, and he ventured to suggest that they should take the bull by the horns, and let the engineer design the steel work. No doubt they had found much bother between the ironwork men and the brickwork men; but the Americans by the plans they adopted stood a very good chance of avoiding that trouble. The proposed object of the paper was to assist in solving the fireproof construction problem. Very little, however, had been said about that; and he might give it as his experience in regard to floorings, that in five or six large warehouses with which he had been connected, the fireproof floorings had been laid on joists with a thickness of concrete of only about 4 in.

Mr. Langton Cole inquired whether the terra-cotta referred to in the paper was to be obtained in London; likewise the wire glass. He had endeavoured to get the latter, and was informed by the firm that they did not make it larger than 2 ft. square, whereas he wanted it 6 ft.

Mr. Lewis Solomon replied that the wire glass could be obtained in London from Pilkington.

Mr. C. H. Brodie remarked that the terra-cotta used for fire-proof floors in the States was of a comparatively soft and porous composition. With regard to the paper that had been referred to, it was something very similar to the Willesden paper. It was largely used in the American frame houses. Mr. Solomon had spoken of the immense amount of copper used. That, he might explain, was taken up by the immense amount used on the roofs. All these huge buildings had flat roofs, sometimes covered with copper, soldered; and, whether in the arctic temperature attending a blizzard, or the intense heat of the summer, they stood thoroughly water-tight. He did not know whether the specification spoken of by Mr. Solomon mentioned tin for roofing, but there was one in the Library which did.

Mr. Max Clarke thought it should be clearly understood that the term terra-cotta referred to by Mr. Gibson in his paper was the hard or solid material, not the porous variety mentioned by Mr. Brodie. The latter was noted in the paper as being better, probably, in many ways than the hard variety, but was not in such universal use, and, in some localities, was more expensive. Messrs. Doulton had made terra-cotta flooring blocks; but, as far as he knew, they could not be procured at once in any quantity in this country.

A member said that with regard to tin roofs he had specified some hundreds of them, they were simply tin tiles.

Mr. Delissa Joseph said that practical application of the principles laid down were very appropriate in the United States, but in this country we should never have the opportunity of building so high as in America; consequently steel



frame construction did not seem to raise such important issues. As to fireproof construction, he questioned whether their capitalists would be induced to build more expensively in that direction so long as the fire insurance companies refused to give assistance or encouragement. After the Cripplegate fire the Goldsmiths' Company arranged a conference with the fire insurance companies to see whether arrangements could be made to adopt, in rebuilding, fireproof principles, and whether the companies would consequently reduce their rates. There were many meetings between the representatives of the insurance companies and the architects, but they came to nothing, because the insurance companies, having put their heads together, insisted that their excessive rates should be maintained. It was then suggested that the companies should define what they regarded as a model fireproof building; but they refused to give themselves away to that extent. As a matter of fact, however, he, in the interests of his clients, introduced a reasonably fire-resisting building, yet it was doubtful whether the insurance companies would lower their extravagant rates when it came to insuring it. So long as this monopoly was maintained, so long would the development of fire-resisting building in London be discouraged.

The vote of thanks having been carried, the President announced that the next meeting of the Institute would be held on December 19, when the following papers would be read:—(1) "The Application of Electric Power to Practical Purposes in Buildings," by Mr. H. R. J. Burstall, M.Inst.C.E.; (2) "Some Practical Hints on the Production and Use of Electricity for Lighting Country Houses," by Mr. Bernard M. Drake, M.I.E.E.

The meeting then terminated.

#### Tea and Smoking-Room.

Arrangements have been completed for supplying light refreshments at No. 9, Conduit-street between the hours of 2 and 8 p.m. The room is provided with writing materials and periodicals, the files are kept of the *Times*, *Punch*, *The Graphic*, &c. The Council have made these arrangements in the belief that if some of the minor conveniences of a club were added to the Institute, the result would be welcome to a great number of members.

#### MAGAZINES AND REVIEWS.

THE *Art Journal* contains views and a plan of the Carnegie Art Gallery at Pittsburgh; a building which, unlike most art galleries, includes also a specially-designed music-room in semi-circular form—not the best form for a music-room, unless very special means are taken to deaden or destroy echo. The interiors of the picture galleries present much the usual appearance of the conventional picture gallery—rather low walls with a cornice and a cove. Mr. Francis Watts' article on Piccadilly contains some good remarks in an architectural sense; one of the illustrations (by Mr. C. Pears) is entitled "Foggy Piccadilly," but the title might apply to pretty nearly all the sketches. This habit of showing only a few faint indications of a scene renders sketching an easy business, but it is an affectation. An article on "Saltaire" bears the signature of the late Mr. Gleeson White. Mr. Fred. Miller's "Cunning Work for Clever Hands" article deals this month with inlaying in coloured woods and stained wood decorations. The illustrations are piquant, but some of them rather too angular in line for our liking.

The *Magazine of Art* devotes considerable space to the work of that gifted and original artist Mr. H. J. Draper, with a number of illustrations of his pictures and figure-studies, which fully bear out the recognition expressed for his qualities as a painter of the ideal. The etchings of Herr Max Klinger, which form the subject of the next article, represent a far less wholesome form of the ideal in art, though his "Eve and the Future" is a beautiful work. "Turkish Artist Scribes of To-day" is an unusual subject of some interest. Mr. Spielmann continues his "Coincidences and Resemblances in Works of Art"; of the "resemblance" in the three reading Magdalenes, by Correggio, Battioni, and Füger, there is no doubt, but we should hardly call them "coincidences." That between Rubens's "Chapeau de Poil" and Uwins's "Chapeau de Brigand" is very

far-fetched; besides, it is known that Uwins's picture was simply suggested by a little girl who was sitting for her portrait, and who in his absence from the studio had amused herself by dressing in some of the property costumes kept there for use in pictures; the story was told many years ago in the *Art Journal* of that day, when an engraving of the picture was published. Nor can we see any resemblance or coincidence between the two pictures of "La Rixe," by Ter Borch and Meissonier. The attitudes in two boy portraits by Lawrence and Millais suggest that the latter painter had Lawrence's work in his mind, either consciously or unconsciously.

In the *Studio* (November 15), "The Illustration of Music" is a new and interesting subject, though these are not so much symbolical illustrations (as the title seems to imply) as decorative covers and page-headings. Mr. Pomeroy's work forms the subject of an illustrated article, as also the work of Mr. Christopher Dresser, which gives occasion for a number of very diverse illustrations of decorative design. Among others there is for once a design for a knocker which really seems as if it was intended to knock with. The *Studio* has had amongst its competitions one for the best design for a "picturesque cottage"; at least we presume it was for design, but the examples given all look like sketches of old cottages. Why not try for a picturesque cottage which suggests a modern and not an ancient building? Perhaps because the problem is a good deal more difficult.

The plate illustrations in the Boston *Architectural Review* look like a series of experiments in architecture; a design for a Roman Catholic church at Oyster Bay, by Messrs. Ingle & Almirall, in ecclesiastical Gothic, with a mixture of large rubble work and half-timber in the walling; a house at Wenonah, by Mr. W. L. Price, somewhat like a French "Maison de Campagne" (but without the spikes); and a competition design for the Jersey City Public Library, by Mr. Freedlander, in a heavy and very modern-French type of Renaissance. We cannot call any of these very satisfactory designs, and their collocation implies a great absence of definite aim in American architecture. The principal article in the number consists of some "Notes on the Architectural Work of Charles Garnier," by Mr. J. R. Coolidge, with illustrations of some of Garnier's work. The article is a very just and well-reasoned criticism, recognising without exaggerating the faults in taste of Garnier's style, while admitting his remarkable power and facility. "None of his work is of great popular interest or of exceptional importance" (his works other than the Opera House, that is), "but all of it is of the same quality of architecture as the Opera, with the same dominant excellencies and defects. Garnier's skill in composition, directness of expression, readiness of invention, and completeness in execution, never forsook him, and his taste in detail steadily improved though it never became wholly reined." It is curious what a contrast there is, however, between the style of the Nice Casino—which once received the unintentional compliment "It looks exactly what it is—a gambling-house," and the severe and restrained style of the house which Garnier built for himself. Garnier knew what his public wanted, both at Paris and at Nice; and it seems to have been not exactly what he would have wanted himself.

The *Engineering Magazine* contains an article on the interesting subject of "The Suspension Bridge—Old and New." The writer, Mr. Gustav Lindenthal, takes a very favourable view of the suspension bridge in an economical and constructional sense, and suggests that the system is of more general applicability than it has hitherto been considered. The article contains an illustration and some account of the proposed North River bridge for New York. The number also contains a paper on "The buildings at Oxford from an engineer's point of view," by Mr. J. W. Parry. This is certainly a new point of view for Oxford, and there is some interesting discussion as to materials and construction, together with remarks on the architecture, some of which are delightfully naïve, and some still more curious blunders on matters of fact. Mr. Parry appears to suppose that the system of hanging a peal of bells to swing in different directions, so as to distribute the pull on the walls, is something exceptional; and he tells his readers that the top of the spire of St. Mary's is 189 ft. from the ground, "the same height as that of the spire of Salisbury Cathedral" (!). The height of Salisbury spire is somewhat over 400 ft. This is a blunder so absurd and withal so easily avoided, that we should think this contributor would hear from the editor when the latter finds out what he has been betrayed into printing. The paper on "Shop Cost Keeping" will be of interest to contractors and manufacturers.

In the *Artist* the "Talks of Three" are continued, and the subject of the Constitution Hill arch, still without its quadriga group, is perceptibly touched upon. Mr. Adrian Jones's quadriga group, "Triumph," is illustrated as a very fitting work for the position. We wish it could be placed there. The illustrations of "Types of Design from Berlin and Vienna," and glass and ceramics in Sweden, are of interest.

In the *Antiquary* Sir Stephen Glynne's "Church Notes" are continued, dealing with Tamworth, Ashby-de-la-Zouche, and Notingham. The remarks in the "Notes of the Month" as to the damage done to Southwell Minster by the restoration are utterly absurd, and can only be regarded as the voice of the blind prejudice of the antiquarian spirit, which thinks that a church in use is to be regarded in the same light as an abandoned castle. This kind of exaggeration may appeal to the archaeological clique, but it will not raise the influence of the magazine with people who can see both sides of a question of this kind.

To the *Fortnightly* Mr. and Mrs. Pennell contribute an article on the "Centenary of Lithography," commencing with the remark (not uncalculated for) that while in general centenaries only occur once in a hundred years, in lithography they happen whenever they are wanted. The article is mainly a historical sketch, mentioning the names of a number of English and Scotch lithographers and lithographic artists, and not mentioning either Charlet, Raffet, Méryon, or M. Fantin-Latour. The omission of the latter may be because it was not within the scope of the article to deal with living artists; the omission of the three former is absurd.

In the *Revue Générale* the illustrated article is this month occupied with Florence, with illustrations chiefly of its architecture; one can hardly suppose, however, that such a subject is to be dismissed in one number. The article, by M. Arnold Goffin, treats the subject from a special point of view, studying the character and history of the Florentines as bearing upon their art.

*Harper* is entirely occupied with stories and war articles. *Scribner* is also very warlike, but includes an illustrated article by Mr. Spielmann on "John Ruskin as an Artist," a subject with which we have the fullest sympathy, having always considered that Ruskin's gifts as an artist (especially in the treatment of architectural subjects) have been as much underrated as his critical faculty has been overrated. Mr. Spielmann does justice to his artistic powers without exaggerating them; the article is one that should be read by all who are interested in art. Under the heading "The Field of Art" are three short articles, signed by different initials, on a subject on which we have several times commented—viz., the determined attempt to Gallicise American architecture on the Ecole des Beaux-Arts models. As one of the writers says, it is indisputable that Paris is a handsomer city than New York, "but it does not follow that the way to beautify New York is to multiply examples of Parisian architecture." All three essayists are opposed to this Gallicising movement, and we are glad to find that some people in the States seem at last waking up to a perception of the mistake.

The *Century* is also largely occupied with war and the destruction of the *Mane*, but at the commencement of the number there is some pretty decorative work in connexion with a Christmas Eve poem, followed by another decoratively treated poem with some effective illustrations.

The *Nineteenth Century* contains an article by Sir J. C. Robinson on "Reorganisation of our Art-Museums" and one by Mr. G. Shaw Lefevre on "The London Water Supply," but what is the special value of the opinion of either writer on his subject may be a matter of question.

The *Contemporary Review* contains a short but very ably-written and discriminating estimate of Puvis de Chavannes, by Mr. C. J. Holmes, whose name is new to us as a writer on art, but who knows what he is talking about. The special qualities of the late artist as a mural painter, and the reasons for



the treatment of his pictures, in regard to design and colour, for that special object, are very well pointed out. In the same number is an interesting article by the Rev. John M. Bacon on "Scientific Ballooning," a *résumé* of what has been done and remains to be done.

To the *Pall Mall Magazine* Mr. F. Wedmore contributes an article on "A great French etcher," Méryon to wit; with some reproductions of his etchings of Old Paris—the Paris of Balzac, including the powerful one of "The Old Morgue," and a characteristic old house in that east-end street with the delightfully suggestive name "Rue des Mauvais Garçons." The experiment of illustrating a short narrative by photographs of the same person with different expressions and attitudes, which has been tried before in this magazine, is repeated with considerable effect in the photographs of Miss Irene Vanbrugh which accompany the article "A Peculiar Attack"; this deserves recognition as a new and rather interesting method in illustration, the person photographed in reality designing attitudes and expressions of face as an artist might design them.

The *Indian and Eastern Engineer* (Calcutta and Bombay) is a monthly publication which has not before reached us, though we see it in its second volume. It contains a good deal of engineering information and illustration, and an article on Indian bungalows, as usually constructed and planned, which is of some architectural interest. It is suggested that the normal Indian bungalow is generally very badly planned, and might be much improved. A number of plans are given.

The *Quarry* contains an article on the Hopion Wood Stone Company, which may interest architects, who are rather inclined to make an increased use of this stone.

## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Mr. T. McKinnon Wood, chairman, presiding.

**The Works Department.**—On the reception of the report of the Finance Committee, Mr. T. B. Westacott inquired when the Council might expect to have the statement of works executed by the Works Department for the half-year ended September 30 last, and whether it was true, as stated in a newspaper, that there had been a loss of 22,000*l.* on the construction of the Lewisham sewer?

Lord Welby, Chairman of the Finance Committee, in reply, said the statement was ready and would be presented next week, when the reports of the executive committees had been received. The statement would contain full information with regard to the Lewisham sewer.

**The Superintending Architect.**—The report of the General Purposes Committee contained the following paragraph: "On October 25, the Council, in view of Mr. Blashill's retirement on December 31, gave instructions for an advertisement to be issued inviting applications for the appointment of a Superintending Architect at a salary of 1,500*l.* a year. In response to an advertisement twenty-seven applications were received. The applications having been carefully considered, and nine of the candidates having been seen, we regret to have to report that we cannot see our way to submit the names of any of the candidates as possessing, in our opinion, the qualifications necessary so important a position. We are considering what course should, in the circumstances, be taken with a view to filling the appointment."

Mr. Dew asked if, in view of the difficulty of finding a suitable successor to Mr. Blashill, the Committee would consider the advisability of dividing the work of the Architect's Department, and appointing two officials—an architect and a surveyor?

Mr. Strong, Chairman of the Committee, said that the question had more than once been considered by the Committee, and they had decided that it was far better to have one head of the department, rather than two, as suggested. He did not know if the Committee could again consider the suggestion; it had previously been considered, and a definite decision had been come to.

**Fire Station, Wapping.**—On the recommendation of the Fire Brigade Committee, it was agreed—

(a) That the estimate of 11,000*l.* to be submitted by the Finance Committee be approved,

and that a fire-engine station be established at Wapping.

(b) That the proposed Wapping station be erected on the site of Nos. 45, 47, 49, 51, 53, 55, 57, and 59, Red Lion-street, and that the Fire Brigade Committee be authorised to make the necessary preliminary arrangements for the acquisition of the premises and the erection of the station on the site thereof.

**Science and Art.**—The General Purposes Committee brought up an urgency report containing a letter from the London School Board with reference to a notification being sent by the Technical Education Board of the London County Council to the Department of Science and Art of the Board's willingness to be responsible for the Science and Art instruction within the County of London. It recommended:—"That the proposal of the School Board for London that a conference be held between the Council and the Board be acceded to, and that the following members be appointed to represent the Council at the proposed Conference:—The Chairman, Vice-Chairman, and Deputy-Chairman; the Chairman and Vice-Chairman of the General Purposes Committee, the Chairman and Vice-Chairman of the Technical Education Board, Mr. Cornwall, Mr. Dickinson, and Colonel Legge." This was adopted.

**Holborn to the Strand Street.**—The Improvements Committee recommended:—"That the Parliamentary Committee be instructed to make provision in the Improvements Bill for the next Session of Parliament for the acquisition, in connexion with the re-housing of persons to be displaced by the formation of the new street from Holborn to the Strand, of land (1) in St. Pancras, bounded on the east and north-east by Packerham-street, on the west by Arthur-street, and on the south by Wells-street, comprising the premises occupied by the London Improved Cab Company; (2) in Holborn, bounded on the north by Holsworthy-square, on the south and east by Little Gray's Inn-lane, and on the west by Gray's Inn-road, comprising the premises of the Holborn Union Workhouse; and (3) in Lambeth, on the north side of Palmer-street, between Cornwall-road and St. Andrew's Church, and on the east side of Cornwall-road, between Palmer-street and the passage known as Peer's-coopage." Mr. Shaw-Lefevre explained that in regard to the Lambeth site fifty people would have to be displaced, but they could easily obtain accommodation in adjacent houses. The recommendation was adopted.

**Hampstead Heath Extension: Golder's Hill.**—

The Parks Committee recommended that the Council do resolve that no portion of the land at Golder's Hill Estate shall be let for private use, and that the house shall only be let as a refreshment house, for some other public purpose; and that the Parliamentary Committee do take steps to obtain an amendment of the terms of the Bill to be brought before Parliament with regard to this matter, so as to provide for such use of the property only; and that the Vestry of Hampstead, the Golder's Hill Acquisition Committee, and other bodies be informed accordingly.

Mr. Shaw Lefevre said they had an opportunity to let the house, kitchen gardens, library and stables at a rental of 600*l.* a year; were the house used by the Council it would cost the public 300*l.* or 400*l.* The difference between the two proposals would, therefore, be about 1,000*l.* a year. The amount received in rent would pay the interest on the money contributed by the Council towards the purchase of the estate.

Mr. Burns, M.P., strongly objected to the suggestion, and Mr. Bond, M.P., Lord Meath, and others supported the recommendation of the Committee, which was agreed to.

**Drinking Fountains and Troughs.**—The same Committee recommended, and it was agreed, that the Council do undertake in future the care and maintenance of all the drinking and other fountains at parks, gardens and open spaces, and do defray the cost of the supply of water to the same; and that the Metropolitan Drinking Fountain and Cattle Trough Association be informed of this decision.

**The Housing Question.**—The following adjourned report of the Housing of the Working Classes Committee was then considered:—

"We now proceed to consider the far larger and more important question of the course to be pursued by the Council in the matter of housing. Apart from the re-housing of persons displaced by improvement schemes which the Council is by

statute required to carry out, it has not hitherto put in force the powers which it possesses under Part III. of the Housing Act, to buy land and build thereon for the purpose of increasing the supply of house accommodation in or near London.

It is true that the Millbank estate was purchased under those powers, but at the time of purchase the Home Secretary was consulted, and agreed that dwellings erected thereon should be taken as providing accommodation for persons displaced by improvement schemes within a radius of two miles from that site. By far the larger portion of this estate has been already allotted for the erection of dwellings to accommodate persons to be displaced from the Clare Market area, and in connexion with the formation of the new street from Holborn to the Strand. We have now to consider whether the Council should buy land inside and outside the county, and build thereon for the purpose of adding to the housing accommodation in London. As this would be an entirely new course we think that we should obtain the sanction of the Council before we occupy the time of the officers in seeking for available sites and entering into negotiations as to cost.

There is no doubt that housing accommodation is at present deficient in London. The census of 1891 disclosed the fact that 214,843 persons lived in tenements of one room; that 128,000 persons, in families of from four to twelve persons in each family, were living with only one room to each family; and from the deputations which have appeared before us, and the resolutions which have been sent to us by local authorities, we gather that this overcrowding is even more excessive now than it was in 1891.

There are several causes which continually tend to increase this evil. First, the area of land required for commercial purposes, factories, and warehouses is continually extending to a wider radius from the centre, and it is desirable that it should do so and supply means of livelihood to a greater number of workmen. In this process of expansion, however, small house property, the dwellings of the working-classes, is destroyed, and builders find it unprofitable to pay the commercial value of land in such districts, and to build working-class dwellings thereon. In some other parts of London small dwellings are being destroyed to make room for large blocks of highly-rented flats and mansions. These causes are continually operating to lessen the number of houses available for the accommodation of the workers in the more central parts of London. On the other hand, the remarkable rise which has taken place in the cost of building has tended to discourage the erection of dwellings in the central districts. The artisans' dwelling companies, with the exception of the East End Dwellings Company, which is still doing very useful work, have almost ceased building for some years, and no dwellings of this description are being built by private individuals."

As an example of this increased cost of building we may mention that when the Council first made contracts in 1890 brickwork was priced at 11*l.* per rod, it is now priced at 20*l.* 15*s.* per rod. We are informed that this is owing to three causes—the rise in the price of materials, the rise in wages, and the much smaller number of bricks laid in a day by each workman.

In strong contrast to the cessation of building of workmen's dwellings in the centre of London is the very remarkable increase in the number of cottage dwellings which have lately been erected in some districts outside the county. This is especially noteworthy along the Great Eastern Railway, where, owing to low fares and a good service of trains to and from the centre of London, many thousands of cottages have been erected. Many of these have two rooms on the ground floor and three rooms above, and are let at about 6*s.* 6*d.* per week. The demand for cottages in this outer circle depends much upon the means of cheap and rapid access to and from the centre of London. There are vacant sites much nearer to the centre than those referred to above, but to and from which access is difficult for workmen owing to high railway fares and a slow tramway service. If the Council were to build upon such sites, there would be no relief to the overcrowded districts of the centre until proper means of cheap and rapid transit were supplied.

It would, therefore, be our first duty to consider, in co-operation with the Highways Committee, how such sites could be made easily accessible to the workers of the central districts.

It must, however, be borne in mind that the financial difficulty which we find so great when we build under Part I. of the Act will be much greater when we come to build on land bought under Part III. Under Part I. the land, when cleared of houses, is written down in value to the price it would sell at when earmarked for workmen's dwellings, but under Part III. we have to pay the full commercial value for land, and it will not be possible to build in compliance with standing orders unless the Council is prepared to lower its present high standard of building. We have obtained much interesting information as to dwellings erected, or about to be erected, in Liverpool, Horney, and Richmond, which we send herewith.

The Council has hitherto expressed an opinion against the policy of building houses of an admittedly inferior type, but if the Council desires to



house the poorest classes in central London it will have to approach more nearly to the Liverpool standard. In the outer circle also cottages will have to be built to a standard more nearly resembling that of the dwellings with which they will have to compete. In building under Part III. there is no obligation to submit plans to any Government department.

It is, we think, generally admitted by the Council that in building to supply houses when under no statutory obligation to do so there should be no charge on the county rate. In this opinion we entirely concur, and we think that the Council should make experiments in a cheaper form of building than it has hitherto seen its way to adopt. We recommend—(c) That, apart from the re-housing required in connexion with clearance or improvement schemes, the Council do approve of action being taken under Part III. of the Housing of the Working Classes Act, 1890, with a view to the purchase of land and the erection of dwellings thereon for the purpose of supplying housing accommodation.

Last week Sir Arthur Arnold moved that the recommendation be referred back to the Committee for further consideration.

Mr. Antrobus seconded.

Mr. H. R. Taylor, referring to the increased cost of buildings, admitted that bricklayers to-day did not do so much work in a day as they did twenty years ago, but what was lost by quantity was gained in quality. It was unfair to compare the cost of work of to-day with the work of twenty-five years ago. The modern architect put as many angles and corners as he possibly could into his building, and this meant increased cost in labour. The price of materials had also gone up from 50 to 60 per cent.

After a long discussion, the Council divided, with the following result—For the amendment, 36; against, 78.

Sir J. Dickson-Poynder, M.P., moved the substitution of the following words—"in anticipation of or" in place of the words of the recommendation "apart from the re-housing required."

Sir Arthur Arnold seconded the amendment, which was defeated.

Lord Monkswell moved, and Mr. Verney seconded, the insertion of the words "provided no charge be made on the county rate thereby."

This was agreed to.

Mr. Howell Williams then moved that after the words "purchase of land" the words "within or without the county of London" should be inserted.

The amendment was negatived.

Mr. C. H. Campbell then moved that after the word "thereon" the following words should be inserted—"and also with the view of purchasing or leasing suitable houses already or hereafter to be built or provided."

This addition having been seconded, was agreed to.

Mr. Balian moved the insertion of words which would enable the committee to buy land upon which buildings already stood, but this, not being seconded, dropped.

Mr. Beachcroft then moved the addition of the following words:—"upon the understanding that when land is so purchased it shall be open to the Council to either lease or sell it for the purpose of erecting working-class dwellings; and that it accordingly be an instruction to the Housing of the Working Classes Committee to submit at the proper time a recommendation for legislation to effect that object."

Colonel Legge seconded the amendment, but on a show of hands it was negatived.

The recommendation of the committee, as amended, was then agreed to.

**Millbank Estate—Plans of Dwellings.**—The same committee reported as follows, the recommendation being agreed to:—

"In 1889 the Council passed a resolution adopting certain regulations as to the minimum requirements which it should impose on itself and others in building working-class dwellings to replace those destroyed by its improvement schemes. These regulations require that—

Living rooms should have a net superficial floor space of at least 144 sq. ft.

Bedrooms should have a net superficial floor space of at least 96 sq. ft.

In addition to these rules we have to conform to regulations as to through ventilation which have been fixed by the Council's medical officer and the Local Government Board. These health regulations preclude us from building on the less costly plans adopted by the artisans' dwellings companies, who are merely required to conform to the London Building Act, 1894. From time to time we have increased the size of the rooms which we provide, and have recently built dwellings with living rooms

of 160 sq. ft. floor space, and bedrooms 110 sq. ft. floor space. As the Council is aware, we are in course of erecting dwellings on the Millbank estate, which will be accepted by the Home Office as providing accommodation for some of the persons displaced by either the Clare-market improvement scheme or the formation of the new street from Holborn to the Strand. So far as we have gone we have planned these dwellings so as to give the large floor space referred to above, with the result that the rents will be fixed at 7s. 6d. per week for a self-contained tenement consisting of a living-room, bedroom, scullery, and water-closet. We are now considering the plans of other dwellings to be erected on the estate, and as we are very anxious to keep the rents as low as possible, we have asked the architect to consider the cost of rooms planned on the smaller measurements prescribed as the minimum in 1889. On the basis of the smaller measurements we find that a rent of 7s. per week will be required for a self-contained two-room tenement, as against 7s. 6d. per week for a tenement with the larger rooms. The tenants on the Clare Market area are, in many instances, paying 4s. 6d. per room per week for very inferior accommodation; but they are permitted to overcrowd, whilst under the Council only two persons per room are allowed. We think that the experiment of the smaller rooms might be tried for two blocks on the estate. We submit the sketch-plans, and we recommend that the sketch-plans of two blocks of dwellings to be erected on the Millbank estate, showing living and bed rooms of an average size of 147 and 100 sq. ft. respectively, be approved."

**Paddington Coroner's Court.**—The Joint Committee on Coroners' Courts and Mortuaries reported as follows, the recommendation being agreed to:—

"On July 26 last the Council sanctioned an expenditure of 3,000l. for the erection and furnishing of the Paddington Coroner's Court and for incidental expenses, and resolved that the manager of works was not satisfied with the architect's estimate of 3,750l. for the construction of the court, tenders should be invited for the carrying out of the work. At our first meeting after the recess the manager of works reported that he did not consider the estimate sufficient. The architect also reported that, having regard to the continued rise in the cost of materials since his estimate was made in June last, he considered that such estimate should be increased to 4,000l. We thereupon inquired whether the manager would carry out the work at this increased figure, and as he was not prepared to do so, an advertisement was issued inviting tenders for the erection of the court. The following tenders were received and referred to us by the Council on the 15th instant:—Messrs. Marchant & Hirst, 3,869l.; Messrs. Spencer, Santo, & Co., Limited, 4,261l.; General Builders, Limited, 4,400l.; Mr. H. H. Sherwin, 4,608l.; Messrs. J. Shillitoe & Son, 5,209l.; Mr. H. C. Clifton, 5,527l. The tender of Messrs. Marchant & Hirst is within the amount of the architect's revised estimate, and we recommend that the tender of Messrs. Marchant & Hirst, amounting to 3,869l., for the erection of the Paddington coroner's court, be accepted; that the solicitor be instructed to prepare the contract; and that the seal of the Council be affixed to the contract when ready."

The Council adjourned at 7.30 o'clock.

#### THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting of this Institution on the 29th ult., Mr. James Mansergh, Vice-President, in the chair, the paper read was on "The Effect of Subsidence due to Coal-workings upon Bridges and other Structures," by Mr. S. R. Kay.

The subject of the paper had frequent application in the busy industrial districts of the coal-fields, where lofty buildings, heavy bridges and costly tunnels were often found in the immediate neighbourhood of colliery operations. It was necessary, therefore, in designing works in such districts to know, first, the principles of subsidence following the working of coal, to determine the position and character of the works; secondly, an approximation to the area necessary to be left unworked for the protection of the same; and thirdly, how the design may be suited to the supposition that the coal may afterwards be worked without any solid pillar being left for support.

Subsidence always followed coal-working where no pillars were left, and was generally proportionate to the thickness of material excavated. The depth regulated roughly the duration of the movement. Subsidence might be modified by tight packing of the goaf (where no coal was left for support) under the area to be protected.

Faults were responsible for much of the damage resulting from coal working. Their

lines were those of greatest weakness in the strata overlying the coal, and subsidence would sometimes travel many yards out of its ordinary course along such lines. They were, therefore, to be avoided in the erection of permanent works, even if pillars of coal were purchased for support, as it was impossible to guarantee against a possible "drag," or "pull over," of the strata, unless an abnormally large area of support was secured, and this on economic grounds was inadvisable. In the absence of faults, natural breaks and joints in the strata within the limits of the dynamic effect of the subsidence, formed the lines of weakness. Fractures seldom found their way to the surface from depths greater than 100 yards, unless the thickness of the seam was considerable, or a thick bed of rock intervened. Workings had been safely carried under canals and rivers at that depth. Subsidence was slower in deep than in shallow mines, and surface breaks were rare save along lines of fault. The effect was felt in the case of buildings more in the nature of a "pull over" than of an actual break. The strain moved with the working face and was not brought into play unless the working ceased for a sufficient time to cause it to become operative.

A series of levels, extending over five years, had been taken by the author over two separate colliery royalties under which the coal was being worked, at depths of 120 yards and 330 yards respectively. They proved, in the former case, that subsidence closely followed the extraction of the coal, and continued for three and a half years, amounting to 70 per cent. of the thickness excavated; in the latter case it followed somewhat later, continued for four years, and amounted to 64 per cent. of the thickness excavated. The strata in each case were fairly level and of the average coal measure character, the movement was uniform, without breaking the surface.

Subsidence around pillars left for support was shown to be most irregular in its action, and no theoretical formulas could be enunciated to apply to all cases, giving the size and position of the support necessary. All rules for that object were therefore of an empirical character, and subject to modification by local considerations. If absolute immunity was to be secured, an ample pillar should be left.

If the site of works be over a fairly large area of goaf, even settlement might be expected, and when complete the surface would be left nearly as before, though at a lower level. Works should be placed away from goaf edges if possible. A period of two years or three years at least, after the coal was extracted, should elapse before commencing works, and more if possible in the case of deep mines. In building ordinary road or railway bridges, of viaducts, the form of the arch should be avoided and steel superstructure employed, having the requisite elasticity to adapt itself to any slight movement subsequent to erection. Waterworks and reservoirs, where certain heights above sea level were to be maintained, should not be constructed in mining districts unless the suitability of the site outweighed the cost of protection. Where coal was worked underneath canals the banks must be puddled and raised to the extent of about two-thirds of the thickness of excavation. Locks should, as a rule, be protected by pillars.

In horizontal mines the theoretical line of break or subsidence over the edge of a pillar was vertical or nearly so. In practice this was found to vary to one side or the other, owing to the natural lines of weakness in the strata leading the breaks out of the theoretical course. This must be allowed for in setting out the pillar which in horizontal mines should surround the structure equally on all sides. For the purpose of ascertaining the size of pillar, under normal conditions, for any depth and thickness of seam, the author gave the following empirical formula, based upon many examples of modern practice:—

$$r = \frac{\sqrt{3d} \times \theta}{0.8}$$

where  $d$  is the depth in yards  $t$  the thickness excavated in feet, and  $r$  the radius of support in yards. In the case of mines inclined to, say, 30 degrees, though the size of the pillar given by the formula was sufficient, its position would not be vertically below the structure as in flat mines, but must be towards its higher side. The author had found that the line of break in such cases was neither vertical nor at right angles to the dip, but midway between the two. Thus, if the angle of dip be  $\theta$ , the angle the line



of break usually made with the horizon was  $90 - \theta$ , and the lateral displacement in the direction of full rise of the seam,  $d$  being the depth, was represented by—

$$d \tan \frac{1}{2} \theta \cos \theta.$$

Pillars of large area at depths of over 300 yards might with safety be partially worked or ribbed across by means of narrow banks or workings 20 yards wide, leaving solid pillars 20 or 30 yards wide between. This was found not to impair the strength of the support, the strata appeared to arch themselves over the worked portions, and there was practically no subsidence. This effected a considerable saving in the purchase of large pillars. In the case of bridges, where a succession of seams would probably be worked, it was necessary to consider whether the subsidence of level and possible rebuilding of the bridge, or the purchase of the mines for support in an increasing descending ratio, was the more economical or preferable.

Bridges with strong well-bonded abutments and wings, and steel superstructure, were frequently worked under, and sustained little or no damage, especially in the case of deep mines. Where, therefore, they must be built over an area to be subsequently mined, the intention being not to purchase support, they should be built in the manner described, and the girders should have a good bearing upon the beds. The subsidence to be expected, amounting to about two-thirds of the thickness excavated, should, if necessary, be provided for in the first height of the bridge; otherwise provision should be made for the eventual raising of the superstructure to its former level if required. Lofty viaducts should be protected by pillars; and lower structures should be built as indicated; the piers should be solid and should not be pierced by an arch. In all cases, if possible, the goaf under the above should at the time of working be tightly packed.

#### ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The fourth meeting this Session was held at 56, Great Marlborough-street, on the 2nd inst. Mr. H. J. Leaning, Chairman of the Section, occupying the chair. The subject of the evening was "Constantinople," which was dealt with by Mr. A. E. Henderson. Mr. Henderson, who is the Owen-Jones Travelling Student, has been spending the greater part of a year in the Turkish capital and its surroundings, sketching and measuring ancient work. He has been fortunate in obtaining permission to draw in mosques which had before been inaccessible to Christians. His visit home is only for a short time, as he intends to return and continue his studies in Byzantine architecture. His address was not a formal paper, but rather a chatty discourse bristling with personal anecdotes of a travelling student's life and work in the Ottoman city, illustrated with many beautiful water-colour sketches, measured drawings and photographs. Mr. Henderson commenced by describing his first view of Constantinople on a clear moonlight night from the deck of the steamer anchored in the Sea of Marmora, the unique beauty of the seven-hilled city, and went on to tell his experiences with the language, his difficulties in getting permission to draw in Santa Sophia, and his ultimate success through the efforts of the British Embassy, his excursions in the three-halfpenny steamers on the Golden Horn, and his police escort when he went a-sketching. He then described the general topography of the city, and the more important buildings, ancient and modern. He mentioned the kindness of the director of the Museum who allowed him to measure and sketch objects of interest free of charge. Some of his sketches and photographs illustrated these, which included the wonderful sarcophagi recently found in Syria and supposed to have been made by the orders of Alexander the Great for one of his generals. Having read a quaint and curious, though very rambling, account of a Frenchman who succeeded, by much crafty intrigue and payment of sequins, in getting into Santa Sophia in the seventeenth century, and making a "draft" from "A Late Voyage to Constantinople" by Monsieur William Joseph Grilot, made English by J. Phillips (London, 1683), Mr. Henderson proceeded to sketch briefly the history of Santa Sophia and to describe his own drawings of the great mosque, which included coloured

drawings of the interior, details of doors, faience, &c. He then described a little Byzantine church of the twelfth century, St. Mary Pammakaristo, of the decoration which he had made some careful drawings. During his residence in Constantinople, Mr. Henderson made the acquaintance of Professor Alex. Van Millingen, of the American College there, who is preparing a work on the ancient wall-surrounding the city, and made for him the drawings and maps which will illustrate the book; proof sheets of some of these he exhibited, and went on to describe the Palace of Porphyrogenitus, which stands at a junction of two parts of the wall to the north of the city—the only beautiful piece of domestic architecture, he said, he had seen in Turkey.

A discussion followed, in which several members took part, and which was summed up by the Chairman, who said Mr. Henderson was to be congratulated on obtaining particulars of buildings hitherto only slightly known to the western world. He called attention to a work on Byzantine architecture by Messrs. Schultz and Barnsley, which is just now completed, and alluded to a church about three miles from Reigate designed by Mr. Barnsley, which was a notable example of the adaptation of the Byzantine spirit to modern design.

Mr. R. Phené Spiers, who attended the meeting as special Visitor, gave some interesting reminiscences of his visit to Constantinople thirty-two years ago and described the form of centring which was probably employed to build the immense transverse arches of Santa Sophia. According to Procopius, who watched its erection, a wall of stone was built up and the arch constructed upon it. When the arch was partly built the wall below showed signs of bulging and the builders were alarmed for its safety. With one of the happy inspirations which the flattering historian attributes to him, the Emperor ordered the arch to be completed at once and when the wall was removed, the arch took its proper position and was perfectly stable. Mr. Spiers said there was no doubt Santa Sophia had the finest interior in the world. He had seen St. Peter's at Rome, Karnak, and Beauvais, but for perfect proportion and beautiful decoration Santa Sophia was unsurpassed.

Votes of thanks to Mr. Henderson and Mr. Spiers were carried with enthusiasm, and Mr. Henderson, having replied the meeting terminated. The next meeting will be held on the 16th inst., when Mr. S. W. Cranfield will read a paper on "Buildings for Secondary and Technical Education."

#### DINNER TO MR. C. W. WHITE.

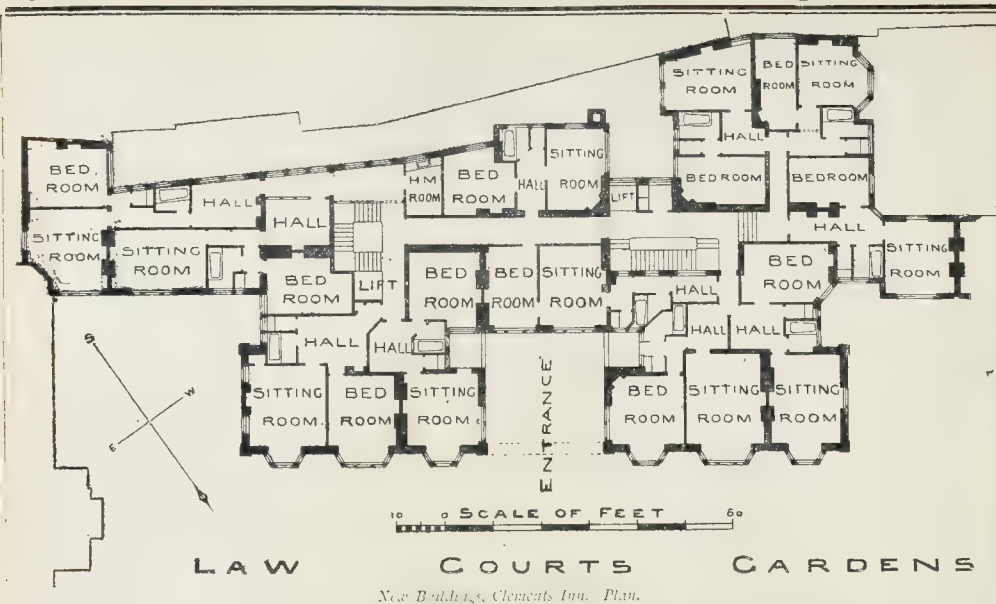
To those of the public who have had occasion to visit the Building Act Office in Spring-gardens, Mr. C. W. White's personality is familiar, and it will interest them to hear that a few of his friends entertained him last week at "Ketter's," in connexion with his approaching retirement from the position of Chief Clerk of the Architect's Department under the London County Council. His official life dates back thirty-eight years, to the time when the Commissioners in Greek-street held sway, before the era of the Metropolitan Board of Works, who in their turn were swept away to give place to the present Council. Mr. White's polite, urbane manner to the public, his official loyalty, his correct judgment, and his unique recollection of all appertaining to his department, have been invaluable to those whom he has served so long. Sir John Hutton, ex-chairman of the Council and of the Building Act Committee, presided at the dinner, and by his genial and interesting remarks afterwards gave utterance to the thoughts of many friends who were not present. The Chairman was supported by Dr. Longstaff and Mr. Payne, both ex-chairmen of the Building Act Committee. Mr. William Davies, J.P., the present chairman of that Committee, Mr. Blashill, the superintending architect, Mr. Hebb, Mr. Lancaster, and Mr. Milwood, members of his staff, Mr. Rowland Plunne, as representing the District Surveyors, and Mr. Kersey and Mr. Collard, as showing the interest of the architectural profession generally. All spoke of their pleasant recollections of Mr. White and their regret at shortly having to part with him. In acknowledging these kindly sentiments and the gift which was presented to him in remembrance of the occasion, Mr. White expressed his appreciation of his friends' kindness, and his pleasure at being invited to meet them at the close of his official life.

#### ENGINEERING SOCIETIES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—The opening meeting of the Session of this Society was held at the Hotel Victoria on Thursday, the 1st inst., when Mr. Baines Dudley, the President, delivered an opening address. He proceeded to refer to the various railway extensions in progress in London, especially the underground tubular system originally introduced by the late Mr. Greathead, which he described as a great step forward in the science of practical engineering. From the citizen's point of view he, however, considered it was not an altogether unmixt blessing, for travelling in tunnels was distasteful to most people, and should a serious accident occur in one of these the extrication of the injured passengers might be extremely difficult. He was of opinion that if a fair trial was given to electric railways on the overhead system it would be welcomed by the public. Dealing with the bridges over the Thames, he suggested that when a railway company was granted permission to construct a bridge over the river, it should be on condition that a road bridge was combined with it, such a regulation, he understood, already existed in some of our colonies. The steamboat traffic on the river had greatly fallen off because the land services had improved to an extent which had not been imitated by the river service; but with covered landing-stages, improved boats, running at greater speed, at more frequent intervals, there was no reason why an all-year-round service should not be resuscitated. The river was also badly lighted, and the public lost after dusk the advantage of this splendid highway through the centre of the metropolis. Were the bridges and banks lighted with diffusive electric arc lamps, traffic could be carried on by night as well as by day. Referring to the labour question, he stated that, during last year only, the working men of this country, through labour disputes, lost 10,300,000 working days. He thought the root cause of the trouble was the destitute condition of the workmen in their old age, the example of which spurred the younger men to demand higher wages while they were able to work, and as this could only be obtained by combination against the employers, strikes were the result. He suggested that the Government should take over the funds and liabilities of the trade societies, and inaugurate a "pro rata" system of State pensions for which compulsory contributions of a per centage of the wages should be deducted by the employer, and paid over to the State Department, and that a judicial commission should be appointed to act as arbitrator in all labour disputes, its decision being final and binding on both parties for a term of years.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, Mr. W. Worby Beaumont, President, in the chair, a paper was read by Mr. George Thudichum, F.C.S., entitled, "The Bacterial Treatment of Sewage." The author observed in his opening remarks that he did not enter into any theoretical considerations, taking it as a fact that the majority of those concerned accepted the general doctrine of bacterial treatment. The paper dealt with practical applications only. After describing the special uses of different processes under varying local conditions of fall, nature of soil and sewage, the author gave in detail the method adopted at Worcester Park, where the Cheam and Cuddington sewage is received, to convert a process of precipitation and irrigation into one of bacteria bed treatment and irrigation when desired, showing how the necessary beds were constructed by excavation and filled with burnt ballast produced on the farm, at a total cost of about 32s., the quantity of sewage to be dealt with amounting to 80,000 gallons daily in dry weather. The conversion of the Sutton sewage works was also alluded to, the cost there having been something less than 2,000l. for a daily flow of half a million gallons of sewage, whilst the saving in working expenses was 500l. per annum. The author then discussed the general questions of the interception of road detritus; the catching by screens or otherwise of pieces of rag and any large floating matter; and the dealing with night sewage by the provision of a special bed for its reception, with syphons for the automatic emptying of the bed in case of storms. The author next dealt with the problem of sewage treatment as applied to hospitals, schools, country houses, and other small communities.





New Buildings, Clements Inn. Plan.

Alternative methods were described, and some particulars were given concerning a recent installation at a large public school. In conclusion, the author pointed out that all the statements made on the occasion of his paper read in 1896 before the Society of Engineers still remained good; that knowledge had greatly increased during the past two years, but without altering, only extending, the ideas entertained at the date of his paper, as a result principally of the Barking experiments; and that the correctness of the particular method of working by alternate filling and emptying had been confirmed by all later experiments.

### Illustrations.

#### THE RE-BUILDING OF CLEMENTS INN, W.C.

**T**HE central block of Clements Inn, as shown in the view here published, is the last of the blocks re-erected in the Inn.

This new block has been erected to the extreme height allowed by the London Building Act, as the demand for offices and chambers is so great in the neighbourhood; fortunately the site is so open that this great height of building was possible without over-shadowing other buildings. The elevation has been designed in a bold outline with a large projecting cornice proportionate to the great height of the building.

The entresol, ground, mezzanine, and first floors have been arranged as offices in suites. The floors above these are planned for residential chambers. Lifts are provided in a central position between the two entrances on the ground floor, and run to the top.

The front of the main wings is faced with Portland stone to the cornice level above the mezzanine windows; above this the walling is of red brick, and the dressings and bays in Portland stone. The roofs are constructed of steel and concrete, and covered with an asphaltic flat; the slopes of the roof are covered with green slates.

The builder is Mr. Edward C. Bull, of Southampton, and the architect is Mr. Basil Slade.

#### ILLUSTRATIONS OF VENICE.

We are publishing in this issue, on another page, a long paper on Venice read at another Bristol Architectural Society by Mr. Mowbray A. Green, architect, of Bath, who is a member of that Society. Though Mr. Green does not enter into any new considerations in regard to

Venician architecture, his paper is a good summary of the history of the city and of the objects of architectural interest in it, and may in that sense have a value to some of our readers, especially to any who may be about to visit Venice for the first time.

By way of adding to the interest of the paper we give, as an accompaniment to it, some illustrations of buildings in Venice which are mentioned in the paper, and which (with the exception of the Grimani Palace) are not among those which are most familiar in illustrations. Among them is a rather curious bird's-eye view of Venice from an old engraving.

#### SKETCHES FROM SIENA AND VENICE.

THE first of these sketches, showing a portion of the principal façade of the Palazzo Pubblico, Siena, is typical of Italian Gothic of the end of the thirteenth century; and though poor Gothic to northern eyes, is, nevertheless, imbued with the artistic feeling never wanting even in works designed in a manner the true principles of which were imperfectly understood. The jointing of the arches, and their greater depth at the apex or crown than at the springing, is peculiar and hardly reasonable, and the segmental arch immediately below the pointed form is a good illustration of how tenaciously the classic forms were adhered to; the crockets to the label afford further evidence of this, and are in themselves a beautiful adaptation of the acanthus to a Gothic feature. In the tympanum of the doorway is carved the arms of Siena—the she-wolf and twins, in white marble, on a blue ground with stars, and on the shield a lion rampant on a red field. The lower stage of the building is of a dark stone, and the upper of red brick relieved by white marble strings and mouldings.

The sketch from the Calle S. Moisè is one of those happy bits so frequently met with in Venice, sometimes when least expected. The simple window treatment, with the wrought-iron grilles, has a pleasing effect. The wall is plastered on the outside, and the natural wear and tear and Nature's colouring, aided by art, combine to give this wall much charm. The original sketches are in colour.

T. R. KITSELL.

#### COMPETITIONS.

**TAVISTOCK-ROAD COMPETITION, PLYMOUTH.**—A competitor writes to us that the drawings for this competition were sent in on September 24, and that on writing to enquire about it he has received a letter from the Town Clerk saying that the assessor has not yet been appointed. From what we hear, we believe that the terms of the competition are considered so

unsatisfactory that it may be difficult to find any assessor who is a member of the Institute who would be willing to act.

#### ARCHITECTURAL SOCIETIES.

**NORTHERN ARCHITECTURAL ASSOCIATION.**—On the 30th ult. the members of the Northern Architectural Association held a meeting in their room at the Art Gallery, Newcastle, Mr. F.W. Rich, President, presiding. It was decided to support a petition prepared by the Royal Institute of Architects against the destruction of ancient buildings in Florence. The Rev. Canon Savage then gave a lecture on "Durham Cathedral," with lantern illustrations. The lecturer gave an account of the architecture of the cathedral throughout its various stages, and was accorded a vote of thanks on the motion of the Chairman, seconded by Mr. Hicks.

**EDINBURGH ARCHITECTURAL SOCIETY.**—On the 30th ult. Mr. R. S. Lorimer read a paper on Scotch gardens before this Society. Mr. W. Nicholson Cumming, the President, occupied the chair. Mr. Lorimer began with a eulogy of the garden as a place of privacy remote from the worries of business, where the imagination and the kindly social virtues grow as of their own accord. Scottish garden history was summed up in an importation of French ideas in the days of the ill-starred Mary, and in this connexion Mr. Lorimer gave some pleasing reminiscences of those romantic times. The great principles of laying out grounds were then enumerated and discussed—the wide demesne beyond the garden unbroken by wall or hedge, the wide, straight avenue, the vistas stretching through the garden to the park beyond, and the disposition of such architectural features as gates, summer-houses, fountains, and statuary. Mr. Lorimer then, with the aid of limelight views, led his audience through a pleasant world of cut yew hedges and close-cropped grass alleys, past rose-gardens and sun-dials, along stately terraces, explaining the while how these pleasing results were obtained from his intimate knowledge of all connected with gardening. The slides illustrated such famous pleasure grounds as Balcaskie, Edzell, Wemyss, and Fordell. Some ingenious French devices of lath trellis-work were also shown. A very hearty vote of thanks was accorded.

**GLASGOW ARCHITECTURAL CRAFTSMAN'S SOCIETY.**—A meeting of this Society was held on Friday last week. The paper for the evening was by Mr. D. Bennet Dobson, and his subject was—"Calculation Simplified," applied to building structures generally. The lecturer treated his subject under the following heads—reactions,





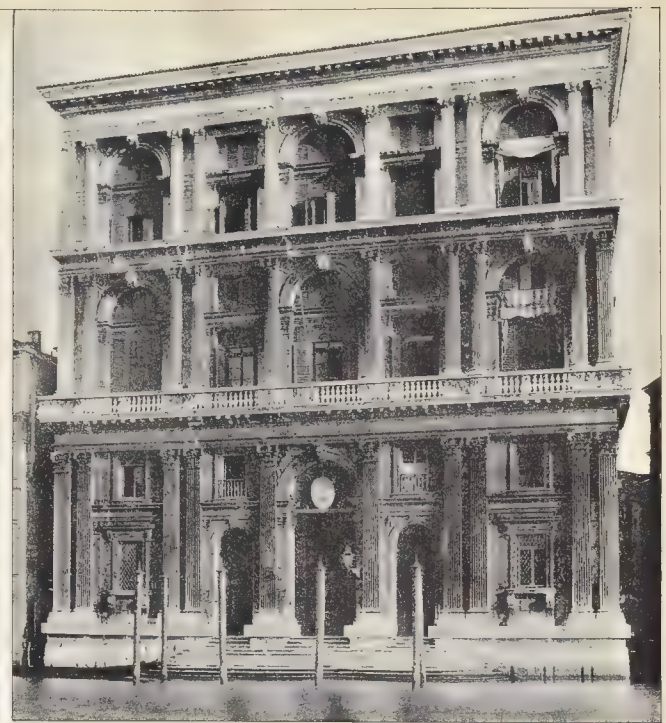
NEW BUILDINGS, CLEMENT'S INN.—MR. BASIL SLADE, ARCHITECT







BIRDS-EYE VIEW OF VENICE. FROM AN OLD PRINT.



GRIMANI PALACE.



FONDACO DEI TURCHI.



REZZONICO PALACE.

NA PHOTO SPRUJE & CO. LONDON & 5 EAST HARDING STREET LONDON E.C.







CHURCH OF SS. GIOVANNI E PAOLO.



CHURCH OF SANTA MARIA DE' FRARI.



A DOORWAY IN ST. MARK'S

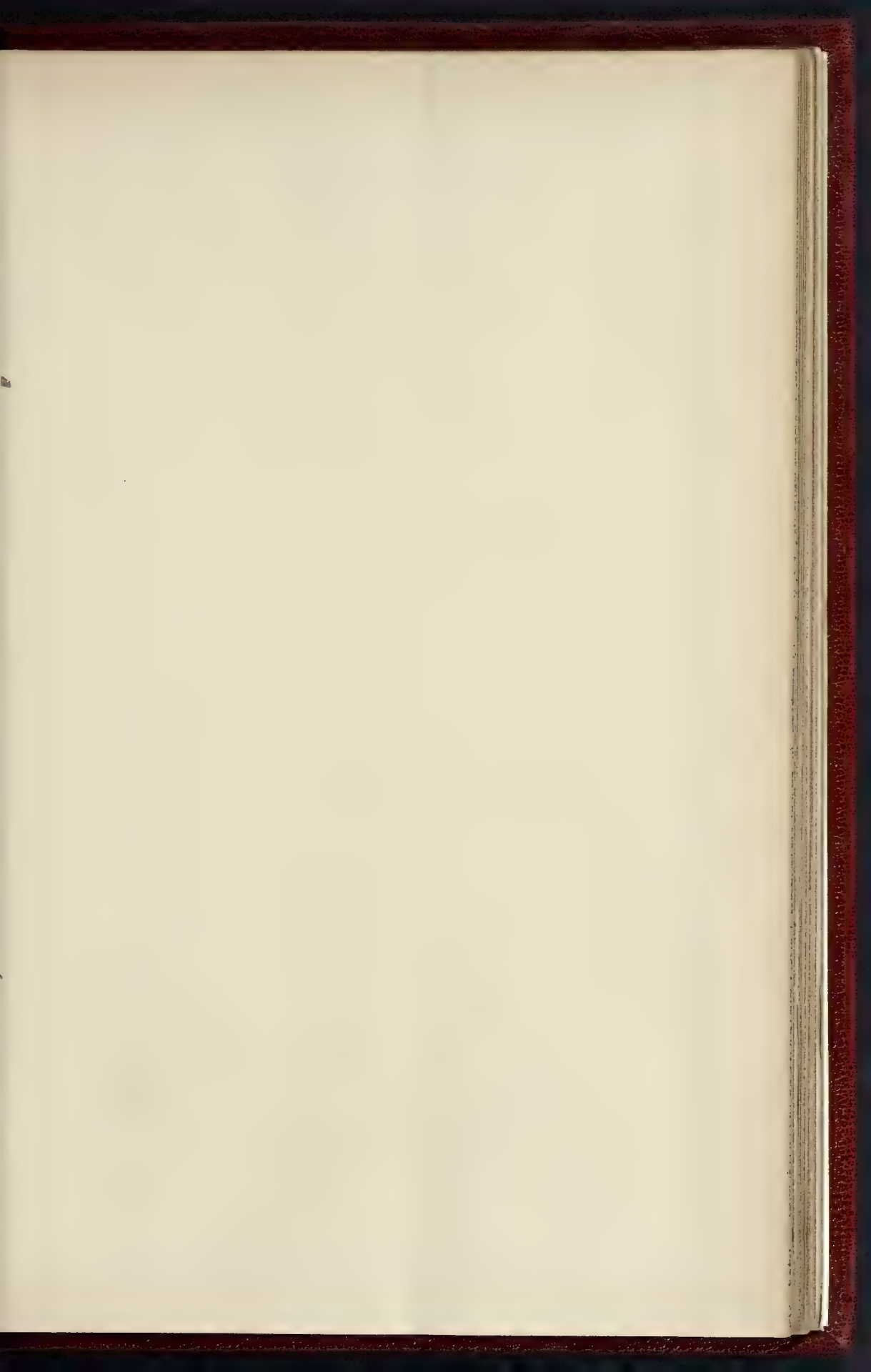


APSE OF SAN DONATO: MURANO.

NA PHOTO SPRAGUE & CO. 445 EAST 10TH ST. N.Y.C.



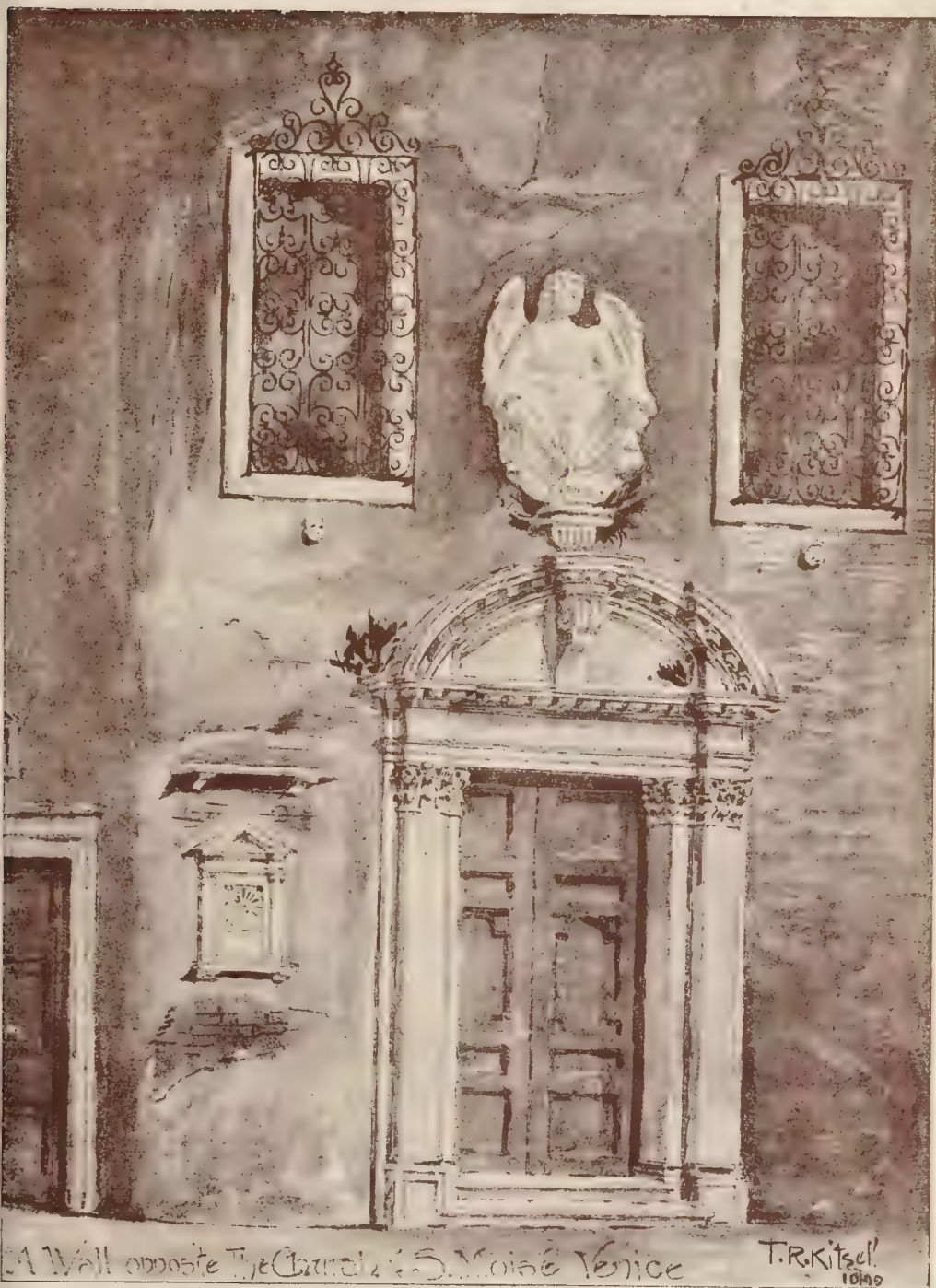






Palazzo Pubblico. Portion of Facade towards Piazza del Campo.





A Wall opposite the Church of S. Moisè Venice

T.R. Kitchell  
1898





bending moments, moments of resistance, mathematics in brief, wood beams, cast-iron beams, rolled-iron beams, steel beams, wood struts, and cast-iron columns, and went over the formulae in a simple and comprehensive manner. He illustrated his remarks by going over examples of each on the black board. He gave new formulae for rolled-iron and steel beams and wood struts, which, when worked out, compared favourably with the older and more complicated formulae. A new one was also given for cast-iron columns, which was very simple and easy to understand—a thing which could not be said of the usual formulae given by Rivington and other text books. It is one which should prove valuable to all members of the Society.

GLASGOW SCHOOL OF ART.—The third lecture on "The Architecture of the Renaissance in France" was delivered on Monday, the subject being the Central Renaissance (Valois Period)—1547-1589. Before the end of the reign of François I. the scene of activity had been changed from the Loire to the Seine; from Chambord and Chenonceaux to Fontainebleau and Paris; and the first characteristic is a decided retrogression of taste on the part of the King's architects in this district. The Palace of Fontainebleau was described, and its gradual extension traced from early times; and salient features such as the Court of the White Horse, the horse-shoe staircase, the Porte Dorée, the Porte des Amunions, the Chapel St. Saturnin, the Hall of Henri II., &c., illustrated. The retrogression which the earlier parts of Fontainebleau evince were not made good till the time when Lesot and Goujon united their labours at the Louvre and the Fontaine des Innocents about 1547, and this marks the commencement of the culminating period. The old Hotel de Ville, Paris, was instanced as an example of transition from Early to Middle Renaissance; and it is in the works of the architects Lesot, Philibert De l'Orme, and Bullant, and of the sculptor Goujon, that the Central period can be studied. As in Italy, the culmination consisted partly in fusion of the several local schools of artists, like those of Touraine, Rouen, Burgundy, and Toulouse, but the word which it writes most plainly is Rome. De l'Orme and Bullant had been there, and had studied closely the monuments of antiquity; so that both French and Italian drew inspiration from a common source and not one from the other. Representative works, such as the Louvre of Lesot and Chambiges the younger, De l'Orme's design for the Tuileries and for the Château d'Anet, and, lastly, Bullant's part of the work at Ecouen and Chantilly, were illustrated and compared in their composition, and their decorative and sculptural details.

#### METROPOLITAN ASYLUMS BOARD.

SIR EDWIN GALSWORTHY presided on Saturday last at the fortnightly meeting of the managers of the Metropolitan Asylums District, at the County Hall, Spring Gardens.

*The Brook Hospital Question.*—No report from the General Purposes Committee was on the paper as to the Local Government Board's decision on the Brook Hospital inquiry; but a further letter was read from the Local Government Board, stating that their attention had been drawn to the fact that there had been the same irregularities by Mr. Aldwinckle, the architect, in connexion with some works at the South Western Hospital, as at the Brook Hospital. They therefore directed that a further sum of £62. should be deducted from Mr. Aldwinckle's commission account.

A long letter was read from Mr. Aldwinckle, replying to the Local Government Board's communication on the recent inquiry. He regarded the report of Mr. Knollys as a fair one, although he did not agree with all the conclusions it contained. Mr. Knollys admitted that most of the work ordered without the direct sanction of the committee was "necessary, or at least very desirable." He only named two items—£657. for teak flooring and £634. for ward stoves—which he considered to have been ordered without justification. On an expenditure of over a quarter of a million this was a very small matter. There was no suggestion that there had been any waste of public money, or that the managers had not received full value for their expenditure. He admitted that he had not taken the proper course, but the managers' interests had not suffered. He indignantly repudiated any suggestion that he

had ordered extra works to increase his fees. The fact that at the Fountain Hospital he voluntarily surrendered 2,200l. of the fees to which he was legitimately entitled showed that this was not a thing he was likely to do. As to the Local Government Board letter, it was not so fair as the report of Mr. Knollys. No allowance was made for the great difficulties of the site, and the short time allowed for the preparation of plans. The words "grave irregularities" should not have been used of a man of his professional standing, who had done so much public work, simply on the ground that some items had been ordered without authority, while there was no suggestion that the public money had been wasted. The cost of the hospital had been increased at least 53,000l. by the difficulties of the site. Deducting that amount, the cost was not above that of other hospitals of up-to-date construction. Long after the criticisms of the Local Government Board were forgotten, the Brook Hospital would stand as a monument of good work done under exceptional difficulties. It was resolved to forward Mr. Aldwinckle's reply to the Local Government Board.

*Appointments.*—Mr. Rowland Plumble, of 13, Fitzroy-square, W.C., was appointed architect of the proposed convalescent children's homes at Rustington, near Littlehampton; Messrs. Newman & Newman, of 31, Tooley-street, S.E., were appointed to prepare plans and specifications and to superintend the alterations of the laundry buildings at Leaveness Asylum.

*No Tenders.*—It was resolved, subject to the consent of the Local Government Board, to accept the offer of Messrs. W. Johnson & Co., Limited, of Wandsworth Common, S.W., to carry out additional alterations at the South-Western Hospital for 1,950l. 4s. 10d., in accordance with the specification prepared by Mr. T. W. Aldwinckle, architect.

*A Delayed Contract.*—The Works Committee reported that they had taken steps to defend an action which had been brought against the Managers by Messrs. Leslie & Co., Limited, claiming damages for "loss occasioned by reason of the Managers having wrongfully impeded and delayed the execution of the contract, dated July 25, 1895, for the erection of the Park Hospital and other premises, and for bonus or loss of bonus payable to plaintiffs, pursuant to a letter from the Managers dated October 21, 1896."

*Proposed Permanent Architect.*—The following motion was down on the paper in the name of Mr. Edward White, L.C.C.:—"That it be referred to the Works Committee to consider and report whether it is desirable for the Managers to appoint an architect or surveyor, or an architect and surveyor to the Board, and if so on what terms and conditions, and for the performance of what definite duties." The Chairman ruled that as the matter had been discussed on June 18, and deferred for six months, the motion was not now in order. Mr. White: I presume it will be in order at next meeting. The Chairman: No, at the meeting after. The Managers then adjourned.

#### APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the London Building Act, 1894. Those applications to which consent has been given are granted on certain conditions.\*

##### Lines of Frontage.

*St. Pancras, South.*—Iron and glass roofing at, and a brick and iron gangway to connect certain buildings on the north and south sides of Conway Mews, Fitzroy-square, St. Pancras (Mr. J. Johnson for Mr. P. W. S. Ell).—Consent.

*St. Pancras, West.*—An iron and glass shelter at the entrance to the Bedford Music-hall, High-street, Camden Town (Mr. B. Crewe for Messrs. Lucas & Johnson).—Consent.

##### Width of Way and Deviation from Certified Plans

*St. Pancras, South.*—Buildings, partly two stories and partly one story in height, with stables on the ground floor, on the west side of Wicklow-street and the south side of St. Chad's-place, Gray's-Inn-road, and certain deviations from the plans certified by the District Surveyor (Messrs. W. S. Cross & Kekwick for Messrs. Willing & Co., Limited).—Consent.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

#### Formation of Street.

*Fulham.*—That an order be issued to Mr. F. Matcham sanctioning the formation or laying out for foot traffic only of a new street, to lead out of the east side of Harwood-road into Cedar-road, Walham Green (for Sir J. H. Johnson). That the name Fashoda-place be approved for the new street.—Consent.

#### Height of Buildings.

*Fulham.*—A theatre on the eastern side of Harwood-road, Fulham, to abut upon a proposed new street, 20 ft. wide, between Harwood-road and Cedar-road, to exceed in height the width of such new street (Mr. F. Matcham for Sir J. H. Johnson).—Consent.

#### BOOKS RECEIVED.

MONOGRAPHS ON ARTISTS. I. RAPHAEL. By H. Knackfuss. Translated by Campbell Dodgson. (H. Grevel & Co.)

ARCHÆOLOGICAL SURVEY OF EGYPT: SIXTH MEMOIR. By F. L. GRIFFITH. (Kegan Paul, Trench, Trübner & Co.)

### Correspondence.

#### To the Editor of THE BUILDER.

##### VENTILATION OF SEWERS.

SIR,—When ventilation is neglected in dwelling-houses, in sleeping apartments—where it is so necessary—in places of worship, and lecture halls, there need be no surprise that it is neglected in main sewers. On the 3rd inst. two men were overpowered and suffocated by the foul gases in a main sewer in Manchester.

The disaster might have been much more serious, as several brave fellow-workmen very nearly lost their lives in trying to rescue their mates. It is evident that there is danger to life in entering unventilated main sewers in certain conditions of the atmosphere. This danger ought not to be; it is a matter of some importance, which the Manchester Corporation will have to deal with.

A few years ago at Llandudno the only ventilation to the sewers was by means of grids at the street level, mostly in the back streets. One of those grids was fixed at the back of the Hydropathic, Neville-crescent. A few days after that I was there on business, and found the foul air escaping freely from the grid—that point being at a higher level than at some other parts of the town. No time was lost in calling upon the surveyor to complain of the dangerous nuisance. He said, "Well, what can be done?" I answered, if he would come with me I would show him what could be done, and what must be done at once. The sewer was ventilated into the steam boiler chimney. This plan has been carried out in other parts of the town, to the great advantage of the healthiness of Llandudno. There is no difficulty whatever in ventilating main sewers, if carried out on a correct basis. In cases where it is necessary to provide a furnace at the bottom of the ventilating shaft, the air from the sewer may be either burnt or disinfected.

Manchester.

J. CONSTANTINE, Sen.

#### ARDROSSAN FEVER HOSPITAL COMPETITION.

SIR,—Your correspondent does well to complain, in your issue of the 3rd inst., about the treatment received by the competitors for Ardrossan and Saltcoats Fever Hospital.

It may not be known that a local architect is the chairman of the Hospital Committee, and in all fairness to his professional brethren he should have seen this matter decided.

Have the plans been sent in simply to give any interested party information, or is the Committee repeating the tactics adopted in the competition for Saltcoats Town Hall, when the competitive plans were set aside? ANOTHER COMPETITOR.

#### SMOKE ABATEMENT.

SIR,—Pending the advent of efficient legislation, much can be done by the simple expedient of placing a layer of coke on the top of each coal fire, in the proportion of a quarter coke, three-quarters coal.

The result as I daily prove is: (1) increased heat; (2) diminished cost; (3) diminished smoke.

ONE WHO HAS TRIED IT.

PROPOSED BLAKE STATUE, BRIDGWATER.—At a meeting of the general committee a report was read from the executive committee appointed to carry out the details connected with the erection of the proposed statue of Admiral Blake on the Cornhill upon the progress already made with the scheme. The committee therefore recommended the work being proceeded with, and a sculptor selected to design and execute the statue. The report was adopted, and the meeting selected Mr. F. W. Pomeroy as the sculptor to execute the work.



# The Student's Column.

SOUND, LIGHT, AND HEAT.—XXIII.

HEAT: TEMPERATURE.

**LOW** temperatures are determined by means of thermometers of various kinds; whilst high temperatures are commonly ascertained by pyrometers, vapour density determinations, seger cones, and the like.

In the construction of ordinary thermometers advantage is taken of the expansion of liquids on being heated. The liquid is confined in a tube from which the air has been abstracted, and very frequently there is a reservoir at one end of the tube. The essential part of the process is the creation of the vacuum (as far as that can be done) without which the liquid cannot be readily introduced into the tube. That part of the process having been satisfactorily accomplished, the end of the tube is sealed up, care being taken, first, not to completely fill the tube with the liquid, but to leave a space above it, which space must also be a vacuum. This is usually done by heating the bulb of the tube in, say, the flame of a spirit lamp which causes the air within to expand; as the air escapes the liquid is let in. The latter is then heated to boiling point, or until it fills the tube, and then the tube is sealed. On cooling, the liquid contracts, and the space left above it in the tube is a fairly good vacuum.

The next thing is to graduate the tube, or to make an index beside it. The bulb of the thermometer is then placed in a vessel containing pounded ice and allowed to remain there for some minutes. The point to which the liquid descends within is then marked off, and this is called zero, or freezing point, and is a fixed position. Another fixed position is the boiling point, which is marked off in a similar way, and the distance between the two can then be readily sub-divided in any convenient manner.

These subdivisions vary according to the method of calculation adopted. In this country we have the most absurd method hitherto devised, viz., the Fahrenheit. According to this, the freezing point is denominated 32 deg., and the boiling point 212 deg.; in the Centigrade (devised by Celsius) the interval between freezing and boiling points is divided into 100, the former being called 0 deg.; in Réaumur's thermometer the freezing point is called 0 deg., and the boiling point 80 deg. The only defence the Fahrenheit method can have is that it divides the interval into more degrees than the others; still, by Centigrade we habitually divide each degree by one-half, so that in reality we get 200 divisions between the freezing and boiling points, instead of 180 deg. as by Fahrenheit. It is very inconvenient in registering very low temperatures to use the last-mentioned scale. For instance, 40 deg. below zero have to be denominated as -8 deg. Fahr., and so on. It is much better to take the Centigrade scale and commence with the minus sign for every degree below zero. In fact, the Centigrade scale is becoming almost universal amongst scientists in practical work. When putting their results before the public they convert the Centigrade into Fahrenheit by a simple calculation, as the public is more accustomed to the latter. A statement, emanating from an official source, in front of us, says that the Réaumur scale "formerly" in use in Germany and Russia is now practically defunct. That is very incorrect, however, so far as Russia is concerned. No doubt the Réaumur is abandoned in national observatories, but any one who has recently travelled through Russia will know that that scale is still the usual one, though Centigrade is seen here and there.

In view of the fact that temperatures are recorded by all three methods in many communications made to engineers and architects in this country, it will be of interest to give the following methods of conversion from one scale to the other:—

To convert Fahrenheit readings to Centigrade, subtract 32 and multiply the remainder by  $\frac{5}{9}$ ; e.g., 68 deg. Fahr. when reduced becomes  $(68 - 32) \times \frac{5}{9} = 20$  deg. C.

To convert Fahrenheit readings to Réaumur, subtract 32 and multiply the remainder by  $\frac{4}{5}$ ; e.g., 68 deg. Fahr. when reduced becomes  $(68 - 32) \times \frac{4}{5} = 16$  deg. Réaumur.

To convert Centigrade to Fahrenheit, multiply by  $\frac{9}{5}$  and add 32.

To convert Réaumur to Fahrenheit, multiply by  $\frac{9}{4}$  and add 32.

To convert Centigrade to Réaumur, multiply by  $\frac{4}{5}$ .

To convert Réaumur to Centigrade multiply by  $\frac{5}{4}$ .

The two liquids commonly employed in making thermometers are mercury and alcohol. The great interval between the temperature at which mercury congeals to the solid state, viz., 77 deg. Fahr. below the freezing point of water, and that at which it boils, viz., 450 deg., above the boiling point of water, renders that metal especially suitable for the purpose mentioned. Moreover, mercury has a very low specific heat, or requires much less heat to raise it to a given temperature than most other liquids which could be employed for thermometric purposes, whilst it does not adhere to the glass of the thermometer tube. One of the advantages of alcohol is that it does not solidify, except at extreme degrees of cold (-130.5 deg. C.); but the spirit rises and falls much more slowly than the mercury, because the specific heat of alcohol is fifteen times as great as that of mercury. In other words, fifteen seconds would be required by a spirit thermometer to measure a temperature which would be indicated in one second by a mercurial thermometer of the same weight. The student will remember that in a good thermometer there should be as complete a vacuum as possible above the liquid in the tube. But in a spirit thermometer that space is sure to be partly occupied by vapour of alcohol, which prevents a perfect record from being made. Other points in favour of the mercurial thermometer for ordinary temperatures is that the liquid expands very regularly over a long range in temperature, whereas with alcohol, and other liquids, the expansion is less regular in proportion as they are near the boiling point. It need hardly be pointed out that the thermometers in common use are not made to register over a great range in temperature. For ordinary purposes the graduations may run from about -10 deg. Fahr. to 120 deg. Fahr., or thereabouts.

Self-registering thermometers are furnished with some contrivance for marking the highest or the lowest temperature to which they have been exposed during a given interval of time. They are commonly U-shaped. Maximum thermometers, for registering the highest temperature in a given period, are more difficult to construct. In the type devised by Negretti (described by Scott\*), the registration is effected by the mercurial column, in the following manner:—The bore of the tube, close to the bulb, is reduced in section in such a way that while the expansion of the mercury is sufficient to force the thread of liquid past the obstruction, the cohesion of the metal is insufficient to draw it back again when the temperature falls. Accordingly the length of the thread of mercury above the contraction measures the highest temperature to which the instrument has been exposed since it was last set.

In Rutherford's minimum spirit thermometer the index is immersed in the liquid, and moves, with a little difficulty, in the tube. The instrument is fixed horizontally; if the temperature rises, the spirit will flow past the index without disturbing it, but if it falls, the index goes back also. The index must mark the greatest degree of cold which has occurred, inasmuch as it will remain unmoved when the spirit advances again owing to any rise in temperature. And there are several forms of self-recording thermometers.

A metallic thermometer is described by Ganot (p. 291), which is of considerable delicacy, and depends on the unequal expansion of metals. It consists of three strips of platinum, gold, and silver, which have been passed through a rolling mill so as to form a very thin metallic ribbon. This is then coiled in a spiral form, and, one end being fixed to a support, a light needle is fixed to the other, which is free to move round a graduated scale. Silver, one of the most expansible of metals, forms the inner face of the spiral, and platinum the outer. When the temperature rises, the silver expands more than the gold or platinum, the spiral unwinds itself, and the needle is moved over an index. The contrary effect is produced when the temperature sinks. This thermometer is graduated so as to approximately register centigrade degrees, by comparing its indications with those of a standard mercury thermometer.

\* "Elementary Meteorology," 1883, p. 27.

Pyrometers are commonly employed where the temperature to be registered is too high for mercury thermometers. None of them give very exact indications and must be regarded only as approximate registers. The principles on which they are based take advantage of the expansion of gases and vapours, or the specific heat of solids. Many forms of the instrument register high temperatures by utilising pieces of pure metal the melting points of which have been previously determined. The following table of fusibility of metals may here be quoted:—

## Fusibility of Metals.

Tin	...	...	...	442 deg. Fahr.
Cadmium	...	...	...	442 " "
Bismuth	...	...	...	507 " "
Lead	...	...	...	617 " "
Zinc	...	...	...	773 " "
Antimony	...	...	...	1,150 " "
Silver	...	...	...	1,800 " "
Copper	...	...	...	1,900 " "
Gold	...	...	...	2,000 " "
Cast Iron	...	...	...	2,780 " "
Steel	...	...	...	4,000 " "
Wrought Iron	...	...	...	above 4,000 " "

It will be noticed in this table that all temperatures above that relating to zinc are approximations. Platinum melts only in the arc-furnace or in an exceedingly good oxy-hydrogen blowpipe flame; that metal is consequently often employed in the best class of pyrometers. In recent years a platinum pyrometer devised by the Master of the Mint has come much to the front.

Dr. E. Buchner\* found some difficulty in registering temperatures in the neighbourhood of 1,650 deg. Fahr., and down to about 1,200 deg. Fahr., and determining to use alloys and metals the melting points of which were known, in his investigations, designed an apparatus to do it automatically. His pyrometer measures the exact moment at which a given alloy or metal melts in the interior of a furnace. The apparatus consists of a vertical tube of refractory material which dips deeply into the muffle; inside this a small crucible is hung from a scale beam above; in the bottom of the crucible is a hole, so that when the alloy melts it runs through into a dish suspended underneath. This causes the scale beam to rise, and the motion of the beam, by electrical contact, rings a bell, and marks a dot on a sheet of paper moved by clockwork; this registers the exact time at which the melting-point is reached. This method only registers a series of more or less definite temperatures, of course.

A large proportion of the pyrometers in use are of very little value, because they are not properly employed. The other day we attended some experiments where, the rod pyrometer being used, a hole was roughly knocked through the wall, and the long end of the rod inserted into the aperture, and so into the blazing material, the temperature of which it was desired to ascertain. The instrument did not register the high temperature required to be demonstrated to us, so the management made no more ado but had a much larger hole broken into the wall on the other side of the building, and bringing the pyrometer round, pushed it through again into the burning mass. Once more the instrument was obstinate, probably on account of the treatment it had received. Apologies were made, and the pyrometer was blamed. As a matter of fact, however, it did its work as well as could be expected in the hands of inexperienced people; for the end of the rod was not thrust into the very interior of the burning mass, and there being a fairly high wind at the time it was too much exposed, for one end of the building was open. With less wind, and with the instrument properly placed, the results would have been different. The same observations apply to seger cones so commonly used in the clayworking industry; these are often blamed for not doing their work properly, but being made of materials of known composition and of known melting points they should not fail—they are prepared with the utmost care.

We have recently had brought to our notice Holdcroft's "thermoscope," in which rectangular strips made from various mixtures of silicates and oxides of known melting points are employed. This is of special interest in the manufacture of tiles, certain red bricks, majolica, fireclay goods, and biscuit ware.

In practice, the workman's eye often forms the pyrometer, but this is a method which must

\* "Dingler's Polytechnisches Journal," vol. cxxxix, 1878, p. 429.



disappear with the advance of technical education. How many bricks, tiles, and china goods have been spoiled by this in being over-fired? How would the manufacturer of cast iron or steel compete successfully by such antique means of arriving at temperature? Surely, those who still adopt the rough and ready guesswork can have no real knowledge of metallurgy—as well might one follow in the footsteps of the alchemists of old. We are afraid to surmise how much valuable metal rendered brittle or altogether spoilt, terra-cotta by warping, bricks by semi-fusion, and porcelain by the glazing going wrong, has been wasted by relying too much on the unaided vision in their manufacture. Nevertheless, judging from the appearance of the fire, the "red heat" obtained in the domestic fire is valued at 1,000 deg. Fahr. And the following results have been obtained by Pouillet:—

	Deg. Cent.
Incipient red ... ..	\$25
Dull red ... ..	700
Cherry red ... ..	900
Dark orange ... ..	1,100
White ... ..	1,300
Dazzling white ... ..	1,500

These colours refer to metals when heated, and are, of course, very approximate. The personal equation, in regard to colours, is too strong for the figures to possess much scientific value.

#### OBITUARY.

MR. J. G. SANKEY.—Mr. Joseph Gibbons Sankey, M.A., architect, Manchester, died on the 1st inst. at his residence, Disley. Mr. Sankey was a native of Blackley. Two of his latest works were the Mercantile Bank in Mosley-street and York-street, and the warehouse of Messrs. Tootal, Broadhurst, & Co., Oxford-street, Manchester.

MR. GEORGE WILLIAM CROSBIE.—The death has just occurred of Mr. G. W. Crosbie. A native of Oxfordshire, Mr. Crosbie was for a great number of years the architectural agent of the late Lord Revelstoke, and to his designs and under his direct superintendence the many farmhouses and lodges upon that estate were carried out. He also was first and foremost in the extensive works connected with the extensions of Membrand, his lordship's home. The church of St. Peter, built from the designs of the late Mr. Pier St. Aubyn, architect, of London, in 1882, at a cost of upwards of 30,000*l.*, was erected, under Mr. Crosbie, by the estate workmen. Mr. Crosbie's services were subsequently secured by Lord Derby. There, as his lordship's estate agent, he had the entire district from Liverpool to Runcorn under his immediate supervision. The funeral took place, on the 29th ult., at Knowsley, a village near Liverpool, where Mr. Crosbie lived. —*Western Daily Mercury.*

MR. T. CLARIDGE.—The death has occurred somewhat suddenly of Mr. Thomas Claridge, for eight years Surveyor to the Swinton Local Board, for twelve years Surveyor to the Stockport and District Highway Board, and up to his decease Surveyor to the Disley District Council. He was formerly engaged upon engineering works in Brussels and other Continental cities. He was fifty-eight years of age, and was well known throughout Cheshire and Lancashire. —*Macclesfield Courier.*

MR. HAMILTON BEATTIE.—The death has just occurred of Mr. William Hamilton Beattie, architect, Edinburgh. He was a son of the late George Beattie, who first came into prominence in his profession by securing by competitive design the commission for the erection of the Craiglockhart Poorhouse. In the carrying out of those plans, Mr. Hamilton Beattie was associated with his father, and from that time dated his first entry into the firm. Since then he has accomplished a large amount of work. In later years his services have been much sought after as an expert and skilled witness in connexion with local and Parliamentary inquiries and valuations. He has been the chief expert adviser to the City of Edinburgh all through the North Bridge-street arbitration. For many years he undertook, similarly important duties, not only for the Corporation, but for the North British Railway Company, who engaged him as their chief adviser in numerous arbitrations. On Princes-street there are several examples of his work, viz., the Royal Hotel, the Clarendon Hotel, the Central Hotel, Charles Jenner & Company's buildings, and the new North British Station Hotel, in process of erection. He was also architect for the northmost section of the new Commercial Bank Buildings in North Bridge-street; the Royal Insurance Buildings, George-street; the Imperial Hotel in Market-street; the Marine Hotel, North Beach; and Pattison's bonded stores at Bonnington were built from his designs, and the Waterloo Hotel has been reconstructed at railway company offices from his plans. Now that a system of cable traction is being carried out through the city, it is interesting to recall that it was largely owing to Mr. Hamilton Beattie the cable system was first introduced into Edinburgh, for he was not

only the engineer of the first line to Goldenacre, but he, along with Mr. Mann, S.S.C., was the original promoter of the company. Mr. Hamilton Beattie, who was fifty-five years of age, was a widower. —*Scotsman.*

#### GENERAL BUILDING NEWS.

ST. MARK'S CHURCH, WASHWOOD HEATH, WARRICKSHIRE.—The last stage in the erection of St. Mark's Church, Washwood Heath, has now been entered upon, and on the 26th ult. the memorial stone was laid. The work was commenced in 1800, but the part then carried out included merely the chancel. Four years later, two bays of the nave aisle were added, and now it has been found possible to enter upon the work of adding the remaining bays, baptistry, and steeple, which were provided for by the plans of the architect, Mr. J. A. Chatwin. The church when completed will consist of a chancel, 30 ft. by 19 ft., on the north side of which will be an organ chamber and vestry, and on the south side a chancel aisle. The nave will be 66 ft. 6 in. long by 16 ft. wide, with north and south aisles 10 ft. wide, while underneath the tower, which will be 110 ft. high, will be an entrance lobby and the baptistry. The materials used in the construction have been red brick, with Bath stone dressings. Altogether the church will cost about 6,000*l.*

RESTORATION OF ALL SAINTS, METTINGHAM, SUFFOLK.—This parish church was reopened by the Bishop of Norwich on the 23rd ult. after restoration. The exterior flint and stone work has been restored and made good, the old flat tiles on the roof have been replaced with slates, and the lead on that part over the nave and aisle has been taken off and recast. The interior of the edifice has been re-seated with pitch pine, and in the chancel two seats have been added, and their carved oak fronts lengthened. The old brick paving has been removed, and a wood block floor laid in its place. On the south side, the lobby entrance has been converted into a vestry, laid with wood block flooring, the old vestry having been pulled down. At the north entrance a lobby has been added. The windows have all undergone treatment. Some have been renewed and others restored, whilst those which had formerly been bricked up have been opened out, and all have been reglazed with square clear glass. The walls have been recoloured, and the oak work cleaned and oiled, and the church is now warmed by hot air. During the progress of the work two piscinas were discovered, one in the chancel and one in the south aisle. The work has been carried out by Mr. A. D. Botwright, builder, of Bungay, from plans and specifications prepared by Mr. W. A. Coombs, architect, of Charing Cross, London.

CHURCH OF THE SACRED HEART, OMAGH, IRELAND.—This church is now rapidly approaching completion. The carving and sculpture work has been carried out under the supervision of Mr. H. Turner Hems (representing Messrs. Harry Hems & Sons, of Exeter) and from the designs of Mr. William Hague, of Dublin, the architect.

WESLEYAN CHAPEL, ELMSWELL, SUFFOLK.—This building, situated near the road leading from Elmwell to Woolpit, and has been erected upon the site of the old chapel. The new structure is about 84 ft. 6 in. by 25 ft., and the extreme height is 31 ft. The chapel has a school-room attached, and a revolving shutter separates one from the other. The main portion of the building is occupied by the chapel, 34 ft. by 16 ft. At the front there is a porch, and additional land bought, and on the site Messrs. Eade & Johns, of Ipswich, were the architects, and Messrs. R. Hogg & Son, of Coney Weston, were the builders.

PROPOSED CONGREGATIONAL CHURCH, WEST HARTLEPOOL.—It is proposed to erect a new Congregational Church and schools at the corner of York and Park roads, West Hartlepool. Mr. W. Lister Newcombe, architect, of Newcastle, has prepared the plans.

METHODIST CHURCH, BURLEY, LEEDS.—On the 1st inst. a new Wesleyan Methodist church was opened at Burley. The new church is situated in Cardigan-lane. The premises have been designed by Mr. G. F. Danby, architect, of Leeds, whose design was selected in a limited competition. They comprise a chapel, school-room, infants' room, church parlour, ministers' room, and twelve class-rooms. The school-room and class-rooms, which are to have communication with the church, are not yet built, but is reserved for them. The church is built of stone lined with brick, whilst all the internal woodwork is of pitch-pine. The principal doorway has granite columns with carved capitals and moulded arches, terminating in a gable. Over this is a five-light traceried window. At the south-east corner a tower and spire rise to the height of 110 ft. Inside the tower is a stone staircase leading to the gallery, which has three entrances. The chapel is 84 ft. long, 48 ft. across the nave, and 57 ft. across the transepts. There is seating accommodation for 480 persons on the ground floor, and 320 in the gallery. The chancel is separated from the chapel by a moulded arch supported on granite columns, with bases and caps of Caen stone. The chancel is lighted by a circular-traceried window. The open-timbered roof rises to a height of 40 ft. The premises are heated on the low-pressure hot-water system. The cost, including site for schools, is 6,500*l.* The work has been carried out by: C. Myers, masonry;

J. Ledger & Son, joiners' work; H. Boston plumber; Atkinson & Son, slaters; Holmes & Co., warming; and J. F. Ebner, the mosaic tiling. RENOVATION OF APPLEDORF CONGREGATIONAL CHURCH, DEVON.—Appledore Congregational Church has been reopened after alterations and renovation. The chapel has been re-seated with pitch pine seats, a new floor and new windows have been put in, the gallery has been altered, the ceiling renovated, and the outside walls replastered. The work was carried out by Mr. J. Tamin, builder, of Appledore; Mr. Sanders, of Barnstaple, being the architect.

BEECHGROVE CHURCH, ABERDEEN.—Tenders, amounting in the aggregate to over 7,000*l.*, have now been accepted from Aberdeen tradesmen for the erection of a new Free Church at Beechgrove-terrace, Aberdeen. Messrs. Brown & Watt, Aberdeen, are the architects. A tower and spire at the principal corner will rise to a height of 175 ft. above the ground level. There will be between the nave and aisles a series of arches of Dumfriesshire red freestone, springing from pillars of polished pink granite, and the walls throughout will be of white Kenmoy granite. The church will accommodate 800 persons, and the hall behind 400 persons. The ceiling will be vaulted, and ribbed with wood, and the building will be lighted by clerestory windows on both sides and traceried windows in both gables.

NEW U.P. CHURCH FOR FALKIRK.—A new church is about to be built in Thornhill-road, Falkirk, by the St. James U.P. Church congregation. The building, which is to be of red stone, is in the Gothic style of architecture. The plan consists of a nave 27 ft. wide by 64 ft. long, with transepts on both sides, which, along with the aisles, 10 ft. wide, are separated from the nave by six arches springing from columns, having moulded caps and bases constructed of stone. The chancel, which is situated at the west end, will contain a communion table and elders' seats. The principal entrance porch, and tower, are at the corner, and the tower rises to the height of 90 ft. The church is to seat 532 persons, and the hall 260 persons. Behind the hall are to be ladies and gentlemen's retiring rooms, with lavatories in connexion therewith. Kitchen accommodation is also provided, with ranges, sink, and meeting purposes, &c. A gallery is provided at the east end of the nave, and altogether the church will accommodate 632 persons. The buildings throughout will be heated by hot-water pipes. The architect is Mr. G. Deas Page, Falkirk, and the building is estimated to cost fully 4,000*l.*

ADDITIONS, ROMSEY, BATHURST, HANTS.—Some new class-rooms have just been opened at the British Schools, Romsey. The new building is of red bricks and Portland-stone dressings. An entrance-porch for the infants leads to a cloak-room, with red and black tile paving. On the right hand the old school is approached, and on the left is a new class-room, 22 ft. in length, 19 ft. in width, and 14 ft. in height. The girls' school is reached through a similar porch on the south side of the building, with cloak-room of larger dimensions. Here, on the left of the entrance, the old school is approached, and on the right the new girls' class-room, 33 ft. by 19 ft. and 14 ft. high, with raised gallery floor. The plans and specifications were prepared by Mr. J. Smith, architect, of Romsey, and the work has been executed by Messrs. Goulding & Son, of the same town.

CHURCH SCHOOL, STANNINGTON, YORKSHIRE.—On the 28th ult., the Church School at Stannington was opened. The old school-house has been pulled down, additional land bought, and on the site a new wing added, new staircases, cloak-rooms, and lavatories have been provided, and the old school-room considerably altered and modernised. The work has been executed by Mr. J. Belfield, contractor, Stannington, under the superintendence of Mr. G. A. Wilde, architect, Sheffield.

BOYS' SCHOOL, WATERLOO, LIVERPOOL.—On the 2nd inst. the cornerstone was laid of a new boys' school in connexion with Christ Church, Waterloo. The site of the new building is at the end of Melrose-road, off the Crosby-road. The plans of the new building have been prepared by Messrs. H. & A. P. Fry, Liverpool, whilst the contract for the erection of the schools has been given to Mr. Councillor James Taylor, of Waterloo. The structure will be of brick, relieved throughout with red stone, brick quoins, and stone dressings on the west or front elevation. A general entrance is provided, with cloak-rooms and corridors on each side, and a room for the headmaster in the centre, near the entrance. In the centre of the building there will be a hall 65 ft. by 30 ft., lighted on each side by means of dormer windows. On both sides of the hall there will be three class-rooms, separated by glazed screens. Each room will be 25 ft. by 24 ft. At the end of the hall there will be a room for the headmaster, and a room for the school-rooms—one 34 ft. by 21 ft., and the other at ft. by 21 ft., the former to accommodate seventy-two children, and the latter eighty-eight. The total school accommodation in the various class-rooms is estimated at about 500.

JONES' WEST MONMOUTHSHIRE SCHOOL, PONTYPOOL.—On the 1st inst. Lord Tredegar opened a block of school buildings erected on a site near the Cwm Fields, Pontypool. The building is of red brick with Bath stone dressings, ornamented by two octagonal towers 84 ft. high; it provides accom-



modation for over 200 boys, including seventy boarders. Within the block are comprised the house of the headmaster, a large hall, classrooms, lecture-rooms, chemical and physical laboratories, art-room, and day, bath, and clothes rooms. In addition to dormitories, there is a sick-room. All rooms are heated with hot-water, and there are, in addition, a gymnasium and a covered swimming bath. The architect was Mr. Stock, London, and his designs were carried out by Messrs. Bowers & Co., builders, Hereford, the contract price being 23,340*l*.

**CHURCH SCHOOL, SCARBOROUGH.**—The opening of St. Martin's Church School at Scarborough took place on Thursday last week. The building affords accommodation for 276 children, and provides for future extension for nearly double that number. The new schools are built of red brick, with stone dressings, with red-tiled roof. They consist of a block of six class-rooms grouped round a central hall. The architects are Messrs. F. A. & S. Tugwell, Scarborough; and Mr. John Barry is the principal contractor. The building is estimated to cost about 4,500*l*.

**HOSPITAL, NEWTON ABBOT.**—On the 20th ult. Newton Abbot Hospital was opened in East-street. The building is about 200 ft. in length and 48 ft. in width, exclusive of offices. The exterior is faced with Stoneycombe limestone, with Kingsteignton and Bath stone dressings, lined internally with hollow brickwork. The administrative block is in the centre of the building, having a vestibule, hall, two convalescent rooms, matron's room, kitchen, &c. On the first floor there are four bedrooms, nurses' sitting-room, bath-room, &c.; and the attic contains three bedrooms. The west wing has a ward for twelve beds, 48 ft. by 24 ft., a nurses' duty room, scullery, private ward, bath-room, and convalescent room, with all the necessary lavatories, scalding sinks, and bath-rooms. The east wing is similar to the west, with the exception of having a linen closet and an operating-room, with the medical officer's room adjoining. The corridor (60 ft. long and 6 ft. 6 in. wide) and the lavatories are heated by radiators from a boiler in the cellar, which also provides hot water for the baths and scalding sinks throughout. In connexion with the hospital there are a mortuary, a doctor's private room, and an out-patients' room. The work has been carried out by Mr. Hugh Mills, builder, of Newton Abbot, from the designs and under the superintendence of Mr. Samuel Segar, architect, of Newton Abbot.

**CONSERVATIVE CLUB, RISHTON.**—A new club is being erected at Rishton for the Conservatives. The new building will be fronting to Cliffe-street, and the estimated cost is about 3,000*l*. On the ground floor are a suite of rooms all converging to a large central staircase hall, which is approached by a lobby 8 ft. wide from the principal entrance in Cliffe-street. These rooms include reading-room, library, card-room, billiard-room, smoke-room, and assembly-room, the latter having two entrances—one from the club and the other from Clifton-street. The stewards' room adjoins the assembly-room. On the first floor there will be a large billiard-room, secretary's or committee-room, and a small lecture-room. The Cliffe and Clifton-street frontages of the club will be faced outside with Yorkshire parquetry and stone dressings; all other outside facings will be of local stone. Messrs. J. C. H. Sandbach and J. Parker, Blackburn, are the architects. Messrs. Noble Bros. are the contractors.

**MISSION HALL, BELFAST.**—A new hall for the Shankill-road Mission, Belfast, has just been opened. The block of buildings has a frontage of 92 ft. and a depth of 135 ft. In designing the buildings it was sought to avoid long corridors by contriving a central octagonal hall, with galleries round and large dome light. This hall will give access to all the departments of the building, and which radiate from it. The building is divided into seven principal departments. The first of these is a large hall, capable of seating nearly two thousand people, designed in the form of an amphitheatre, with a single gallery. This hall will have entrances and exits from the Shankill-road, and also from Carlisle-street. In connexion with the hall are gentlemen's, ladies', and choir and committee rooms and cloak-rooms. The second is a medical mission department, comprising a large waiting-hall, capable of seating about two hundred; a doctor's consulting-room and dispensary, and dressing-rooms. It is entered by the main entrance of the building. The third, or business part of the premises, will consist of four large shops—two on either side of the main entrance—and also offices over these shops. The fourth is a soup kitchen department, with convenience for cooking and supplying food, &c. This department can also be entered directly from the Shankill-road. The fifth section comprises a minor hall and class-rooms. This hall will be situated on the first floor, and will be capable of accommodating 250 people. There will also be several class and committee rooms. The sixth is a social and recreative department. These rooms will be situated on the second floor, and will comprise general parlour, men's reading-room and library, boys' club-room, and girls' guild-room, and also ladies' private sitting-room. The seventh department is the residential training home. This will comprise four separate departments:—(1) A wing, with parlour and bedroom accommodation for gentlemen students, and a corresponding wing

for lady students; (2) the superintendent's residence, (3) the lecture hall and class-room departments, (4) the servants' department. Altogether, there will be accommodation for twenty students. Over a part of the building there will be a flat roof, with staircase communication, so that it can be used as a recreation-ground in the summer months. Mr. W. J. W. Roome was the architect, while the builder's work has been carried out by Messrs. McLaughlin & Harvey. The steel work was done by Messrs. Moreland & Son, London; the heating by Messrs. Musgrave, of Belfast; and the painting and decorating by Messrs. George Morrow & Son, Belfast.

**PROPOSED PUPIL TEACHERS' TRAINING COLLEGE, LEEDS.**—It is proposed to erect a pupil teachers' training college on a site in close proximity to the Higher Grade Board School at the junction of Great George-street with Woodhouse-lane, Leeds. It will have a frontage to Great George-street, being separated from the Higher Grade School by an open space. The designs for the building have been prepared by Mr. J. M. Bottomley, architect, of Leeds and Middlesbrough. The basement will be utilised for workshops, in which there will be carried on hand and eye training, the manipulation of wood and iron, and industrial instruction. It is intended, however, to use the basement largely to supplement the work of the laboratories in the Higher Grade School. On the ground floor, the college will be provided for training in a series of class-rooms. The top story is to be organised specially for the development of drawing. The Board hope to arrange special lecture rooms and to provide a complete outfit for the training of teachers in drawing. The site has cost 17,000*l*, and the building will probably involve a further expenditure of 20,000*l* or thereabouts.

**THE TEES CONSERVANCY COMMISSIONERS' NEW OFFICES.**—At a meeting of the Plans Committee of the Middlesbrough Corporation, on the 21st ult., a set of plans was submitted by Mr. J. M. Bottomley and Mr. Whigham, joint architects, on behalf of the Tees Conservancy Commissioners, for new offices proposed to be erected by the Commissioners in Queen's-square, Middlesbrough. According to the plans submitted, the buildings, which will stand on a site practically in the middle of the square on the side opposite to the present Erimus Club, will have a frontage of 72 ft. and will be four stories high. The plans have been approved by the Commissioners. In the basement will be the cellarage, storerooms, and munition-rooms. The main floor, which will be raised about 3 ft. 6 in. from the level of the outside footpath, is given access to from the main entrance, which stands in the centre of the frontage, and from which a porch is shown to project about 10 ft. forward of the main building. The main floor contains the offices of the secretary and his staff, and for the payers of dues, and also a committee-room and a waiting-room. These and the main staircase are approached through a wide corridor. On the first floor is a Board-room, 50 ft. long and 27 ft. wide, and as high as two ordinary stories of the building, with an ante-room adjoining, and offices for the engineer and his staff. On the second floor will be offices for the engineer's engineering staff, and for other purposes of a general character. The whole of the floors are fireproof and, with the exception of the main corridor, will be laid with wood blocks in either oak or maple. The main corridor will be laid in mosaic and the main staircase will be of stone. Each floor will have its own strong rooms. On each floor also is provided a lavatory and a water closet. The roof of the building will be a caretaker's cottage. The building is Renaissance in style, in red brick and red terra-cotta. The estimated cost of the buildings is 8,000*l*.

**FREEMASONS' TEMPLE, TORQUAY.**—On the 1st inst. a Masonic Temple was opened at Tor Hill-road, Torquay. The temple has been built from designs by Mr. W. G. S. Bridgman.

**EMPIRE PALACE, WOLVERHAMPTON.**—This new building has been erected in Queen-square, Wolverhampton, and extends to Cheapside—taking in the site of the old Empire Palace of Varieties which formerly stood in the last-named thoroughfare. The new palace has been erected by the Empire Company, Limited, the architects being Messrs. Oswald & Ward, of Birmingham. Mr. F. Lindsay Jones, of Wolverhampton, is the builder, and Mr. Alfred Higgins has acted as foreman of works.

**NEW WING, WHITCHURCH COTTAGE HOSPITAL, SALOP.**—The new wing of the Whitchurch Cottage Hospital, which has been added as a memorial of her Majesty's Diamond Jubilee at a cost of upwards of 1,200*l*, was opened on the 30th ult. The work has been carried out by Mr. R. Powell, of Prees, from designs by Mr. Walter Webb, the original architect of the building.

**THROAT AND EAR HOSPITAL, BRIGHTON.**—The Duke of Norfolk opened on the 20th ult. the Brighton, Hove, and Sussex Throat and Ear Hospital, which has been erected in Church-street. Messrs. Scott & Cawthorne were the architects (their plans being selected in competition), and the building contract of Messrs. Saunders, for 4,200*l*, was accepted.

**THE EXTENSION OF THE CENTRAL STATION, GLASGOW.**—The minutes of the Parliamentary Bills Committee of the Glasgow Corporation containing a memorandum by Mr. A. B. McDowall, City Engineer,

with reference to the scheme of the Caledonian Railway. Mr. McDowall says the project embodies an enlargement of the Central Station, extending from Gordon-street to Bridge-street, and involving the increased covering of Argyle-street, Ann-street, Broomielaw, and Clyde-place, as well as the construction of a girdy-wire bridge across the harbour to the works of the present railway viaduct. The Argyle-street bridge is to be extended to the corner of Hope-street, whereby the present covering of the street will be practically doubled—the dimensions being increased to 337 ft. along the north building line from the present measurement of 185 ft., and 323 ft. along the south building line as compared with 140 ft. at present. Ann-street bridge will be enlarged from 98 ft. on the north building line to 208 ft., and from 100 ft. on the south building line to 206 ft. The Broomielaw crossing is increased by 185 ft. and 165 ft. on the north and south sides respectively. The new bridge across the harbour is shown at an average width of 137 ft., and the Clyde-place crossing is increased from 55 ft. to 178 ft. *—Glasgow Herald.*

**NURSES' HOME, NORTHERN HOSPITAL, LIVERPOOL.**—The Nurses' Home of the David Lewis Northern Hospital has now been completed. The home, which forms part of the scheme of the new hospital to be erected out of the David Lewis Trust fund, is situated at the junction of Leeds-street and Great Howard-street, and has been built in red Rulon brick. There are three floors, each with twenty bedrooms and a sitting-room, in addition to two smaller sitting-rooms. Each floor is supplied with bath-rooms, lavatories, box-rooms, &c. In the basement are other box-rooms, kitchen, scullery, larder, and a room in which the nurses will be given the course of instruction. Electric light has been introduced throughout the interior. The joint architects are Messrs. Pennington & Son and Mr. C. W. Harvey, and the building contractors Messrs. W. Thornton & Sons.

**GRAND THEATRE, LUTON.**—This theatre, which is to be opened on Monday, is a two-tier house constructed on the cantilever system. The whole of the floors are of concrete. There is seating accommodation for about 1,000 persons, and standing accommodation for about 350 persons in addition. The proscenium opening is 24 ft. by 24 ft., and the stage has a total depth of 30 ft., with an extreme width of 46 ft., with an additional area of 5 ft. by 15 ft. on the prompt side. The proscenium opening is fitted with a fire-resisting curtain, and the stage with all latest improvements. Provision has been made for ten dressing-rooms and a band-room, with necessary conveniences. Three refreshment bars have been provided, together with cloak-room and lavatory accommodation. Upon the pit level there are thirteen entrances and exits, including two to the dressing-rooms in case of fire. The theatre is lighted by gas, there being no electric system of lighting at the present time in Luton. The main entrance will be paved with marble mosaic. The exterior is faced with grey Luton bricks, relieved with quoins and dressings of red bricks and St. Aldhelm bog ground stone for cornice strings, &c., the ornamental gables being carried out entirely in stone. The whole of the work has been designed and carried out under the superintendence of Mr. C. H. Shoppee, London, while the contractor is Mr. W. G. Dunham.

**ADDITIONS TO THE SEAMEN'S HOSPITAL, LONDON.**—Some additions have been begun to this hospital, from Mr. Keith D. Young's designs. The hospital stands upon some reclaimed land lying between the Royal Albert Docks and Connaught-road railway station. The enlargement is intended for purposes of a medical school, which, under a new scheme, will be attended by colonial doctors and other students of malaria, beri-beri, dysentery, and other tropical diseases. There are at present only twenty-three beds. The patients come from all parts of the world.

**NEW BUILDINGS IN ABERDEEN.**—Among the plans approved of at the last meeting of the Town Council's Plans Committee were those of a new public school at Westfield (Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen, architect—cost, 8,000*l*.), and of a block of buildings at Wallfield (Mr. Peter Slessor, architect—cost, 3,000*l*.).

**NEW BUSINESS PREMISES, ABERDEEN.**—There has just been finished for Messrs. Thomas Ogilvie & Sons, manufacturers, Aberdeen, a large granite building, covering an area of 50 ft. by 150 ft., and having four floors and attics, the height from the basement to the attic being 62 ft. The structure is founded on three sides by thoroughfares—Dee-street, Dee-place, and Oldmill-road. There are two electric lifts, the whole place will be lighted by electricity, and all the machinery will be driven by electric current from the town's mains. The total cost will be about 20,000*l*. The architects are Messrs. W. & J. Smith & Co., Aberdeen, and the contractors are the various works are: mason, Robert Smith; carpenters, Hendry & Keith; slater, George Currie; iron work, McKinnon & Co.; plaster work, Scott & Sellar; plumber, A. B. Robertson; glazier, Mr. Copland; painters, Jas. Garvie & Sons; electric light, R. G. Botting & Co.—all of Aberdeen; motors and lifts, Spencer & Co., Melksham, Wiltshire.

**MASONIC HALL, CAMBORNE.**—The corner and two memorial stones have just been laid of the new Masonic Hall now being erected for the local lodge



in Cross-street, Camborne. The frontage of the hall is 37 ft. and depth 41 ft. There will be two floors. Mr. Sampson Hill, of Redruth, is the architect; and Messrs. Frank Mitchell, Crowan, and Barbary, Camborne, are the contractors.

**SOCIAL CLUBS, BYKER, NEWCASTLE-ON-TYNE.**—At 65, 67, and 69, Grafton street, and at 45, Brinkburn street, Byker, two social clubs have just been opened by the Mayor. A good deal of preparatory work has had to be done to make the premises ready for occupation. Mr. A. B. Plummer is the architect to the venture, and from his designs the interior of the Grafton-street building has been entirely remodelled. The front lower portion of the hall will still be occupied by the Salvation Army. Behind this three rooms have been formed, which are to be let to benefit societies. For the use of members there is a reading-room, 26 ft. by 11 ft., on the ground floor, and upstairs there is a games-room, 25 ft. by 18 ft. The upper portion of the old hall has been converted into a billiard-room. It contains six new tables. The Brinkburn-street Club is a corner house and shop, at the junction of Carville-road with Brinkburn-street. The shop has been let off. A reading-room has been constructed, 25 ft. by 15 ft., and also a games-room. Upstairs is a billiard-room, 30 ft. by 21 ft. 6 in. Opening out of the billiard-room is a billiard-parlour, which will be used as a reading-room. The alterations to the premises have been carried out by Mr. Walter Baston, the plumbing has been done by Councilor Arthur Scott, and the painting by Mr. Richardson.

#### SANITARY AND ENGINEERING NEWS.

**TRIBUTARY SEWERAGE, LEICESTER.**—Mr. E. A. Sanford Fawcett, Local Government Board Inspector, held an inquiry at the Town Hall, on the 29th ult., in reference to applications by the Leicester Town Council to borrow 30,692*l.* for sewerage purposes, and 250*l.* for the purchase of land for street improvements. The Town Clerk said that in compliance with instructions from the Highways and Sewerage Committee, the Borough Surveyor (Mr. E. G. Mawbey) prepared a report on the condition of the tributary sewers of the borough. Thirty-three and a quarter miles of the existing tributary sewers had been examined in 421 streets of the borough, and about thirty-two miles of sewers in 408 of those streets had been found to be exceedingly defective. In the Borough Surveyor's opinion it was absolutely necessary to abolish the defective sewers and replace them by new sewers of modern design and construction. The Borough Surveyor estimated the approximate cost of a scheme of new tributary sewers for the whole of the borough at 128,301*l.*, and the Council on July 26 adopted the Surveyor's recommendation that such a scheme should be undertaken. It was proposed, however, to carry out the scheme in four sections, each section comprising about a quarter of the area of the town. The first section which it was proposed to deal with, and to which the present application of the Board related, comprised about eight miles of sewers in the streets in the district bounded by Humberstone-gate, Humberstone-road, Belgrave-gate, and the Willow Brook. He might add that the sewers to be superseded were known as Wicksteeds, and were laid about forty-three years ago under the authority of the Leicester Sewerage Act of 1851.—The Borough Surveyor then gave evidence. Within the last eleven years, he said, the town had been provided with new main intercepting sewers, a sewage pumping station, and sewage disposal works. A main storm drain sewer had also been constructed to remedy the previous backwatering of sewers and the flooding of basements. It had now become absolutely necessary to deal with the existing tributary sewers in the old part of the borough. He had examined these sewers by the sinking of 1,436 trial holes, and found that about 32 miles of them, in 408 streets, were exceedingly defective, and should in the near future be replaced by sewers of modern design and construction. Of the 32 miles of defective sewers in the whole of the four districts, nearly 20 miles were brick sewers, and rather over 3 miles pipe sewers. In the No. 1 district, now proposed to be severed, there were about 7½ miles of defective sewers to be abolished, of which 7 miles were brick sewers and about ½ mile pipe sewers. Only in very few instances was mortar found in the joints in the lower half of these sewers, and many had none in the crowns. They were constructed with wide cross-joints, very distorted in section, and undulating in gradient. Some had hardly any fall, and in a few places the fall was even the wrong way. The pipe sewers were just as unsatisfactory, and were defective in a number of ways, and the ground around the sewers was found more or less contaminated by the sewage which had escaped through the open joints. In the section under consideration there would be 7½ miles of new pipe sewers, and 0.44 miles of new brick sewers, and the scheme was on the combined system of sewerage, because he considered it inadvisable to adopt the separate system in these old and densely-populated districts. The narrowness of the streets, the great number of dwellings and business premises which abutted directly thereon, and

the large amount of traffic fouled the carriage-ways and the footways and gulleys to a much greater extent than in the more modern and outlying parts of the borough, where the streets were wider and the efficient private sanitary arrangements prevented the fouling of the surface drainage. Ventilation would be provided for by means of cast-iron shafts fixed on buildings, and carried up above the levels of the ridges of the roofs, arranged so as to be clear of all windows and chimneys. Additional ventilation would also be provided for the portions of the existing intercepting sewers in this district by means of similar cast-iron shafts, and in a few cases by brick shafts of larger area. The system of surface grids ventilation had been well tried in Leicester under all conditions, including those most favourable to it, with the result that it had been found a fruitful source of intolerable nuisance by reason of the offensive emanations from the grids, and strenuous complaints from the public were a very common and frequent occurrence.—There was no opposition to any of the proposals.

**SEWERAGE, GOMERSAL, YORKSHIRE.**—On the 29th ult. an inquiry was held at Gomersal by Mr. H. H. Law, an Inspector of the Local Government Board, with reference to the application of the Gomersal District Council for sanction to borrow 10,000*l.* for purchase of the undertaking of the Gomersal Water Company, and 8,000*l.* for sewerage and sewage disposal. With reference to the drainage Mr. William Prest, C.E., of Bradford, assistant to Mr. John Waugh, C.E., explained the plans in detail.

**THE EAST LONDON WATER SUPPLY.**—The Directors of the company, at their meeting on the 1st inst., resolved, on the advice of their engineers, to resume the construction of the new supply.

**PUBLIC IMPROVEMENTS, SCARBOROUGH.**—Mr. H. H. Law, Inspector under the Local Government Board, held an inquiry in Scarborough Town Hall on the 30th ult., with reference to an application by the Town Council for power to borrow 4,471*l.* for purposes of public improvements. The Town Clerk (Mr. J. E. T. Graham) stated the 4,890*l.* was required to purchase 3¼ acres of land in Manor-road for a recreation ground.

**DEVONPORT SEWAGE WORKS.**—Lieut.-Col. Albert C. Smith, R.E., Local Government Board Inspector, held an inquiry at the Municipal Offices, Ker-street, Devonport, on the 29th ult., in connexion with an application for sanction to borrow 4,500*l.* for sewerage works. In the course of the proceedings Mr. J. F. Burns, Borough Surveyor, explained the proposed scheme.

**NEW YTHAN BRIDGE AT FYVIE, N.B.**—The new bridge built by the Turriff District Committee of the Aberdeen Town Council over the Ythan, at Fyvie, was opened on Monday. It is built on the site of the previous one, which had stood for about 150 years, has been constructed by Mr. James Ferguson, contractor, Bogtanna, Fyvie, from plans prepared by the County Engineer, Mr. John D. Watson. The bridge has a length from roadway to roadway of 63 ft., and a clear width of 20 ft., which is double the width of the old bridge. It has two spans, each of which is 23 ft. 3 in. wide.

**NEW BRIDGE OVER THE WEAR.**—A new foot-bridge has been built over the Wear. The bridge is built on the site of the old ferry, which it will supersede, immediately in front of Lumley Castle. The bridge is a light structure of iron and steel, and stands upon four steel columns driven into the bed of the river at each side. Mr. David Balfour, of Newcastle, was the engineer, and the builders were Messrs. Head, Wrightson, & Co., Stockton.

#### STAINED GLASS AND DECORATION.

**DECORATIONS, ST. PETER'S ROMAN CATHOLIC CHURCH, BRIDLINGTON.**—The decoration of the sanctuary of the Roman Catholic Church of Our Lady and St. Peter, Victoria-road, Bridlington, has just been completed by the insertion of a third stained-glass window of two lights, the subject being St. Thomas of Canterbury and St. Helen. The work was entrusted to Messrs. Meyer, of London.

**WINDOW, ROLLESBY CHURCH, NORFOLK.**—On Advent Sunday a new stained-glass window was unveiled and dedicated at Rollesby Church. The work was designed and executed by Messrs. Cox, Son, & Bache, architects, of London.

**WINDOW, PARISH CHURCH, MORVEN, N.B.**—A stained-glass chancel window has been placed in the new Parish Church of Morven, in memory of the late Rev. Dr. John Macleod, of Govan. The window is by Mr. Norman Macleod Macdougall, and has been carried out from the design of Mr. Macgregor Chalmers, the architect of the church.

**MEMORIAL WINDOW, BOSLEY, CHESHIRE.**—A new stained-glass window has been placed in the Church of St. Mary the Virgin, Bosley, by Mrs. Bullock, in memory of her husband, Abraham Bullock. The subject illustrated is "The Presentation of Christ in the Temple." The window has been executed by Messrs. R. B. Edmundson, of Manchester.

**MEMORIAL WINDOW, ST. GILES' CATHEDRAL, EDINBURGH.**—One of the large windows on the south side of the nave has been completed in stained glass, with subjects, according to the general scheme of the St. Giles' Board, illustrative of the life of Joseph. The window is about 20 ft. in height, subdivided by the stonework into eight compartments

and tracery. The window is placed by Mrs. Stewart in memory of her husband, Messrs. A. Ballantine and Gardiner carried out the work.

**WINDOW, ST. MARY'S, WOLVERHAMPTON.**—The large aisle window in this church has been filled with stained glass to commemorate the Queen's Diamond Jubilee. The lights are divided into an upper and lower section, with canopies and bases of the Perpendicular style. There are four subjects illustrating the active ministry of our Lord, comprising the Baptism of Christ; and three typical scenes of the ministry, viz., the marriage in Cana of Galilee, the call of Simon and Andrew, and the Parable of the Sower. The work has been carried out by Mr. H. A. Hyman, of Chelsea.

#### FOREIGN.

**FRANCE.**—It is said that steps are being taken, in view of the future Salons, to amalgamate the Société des Artistes Français and the Société Nationale des Beaux-Arts.—At the last meeting of the Académie des Beaux-Arts, Sir Edward Poynter was elected "Correspondant étranger" in place of Sir Edward Burne Jones.—Last Sunday the monument to Dr. Charcot was inaugurated in the Place Salpêtrière. It is the work of M. Falguière, sculptor, and M. Samson, architect.—Important works are being carried out by the Railway Company "de l'Est" for enlarging the station on the Boulevard de Strasbourg. The works are being carried out under the direction of M. Siegler, engineer, and M. Gouny, architect.—M. Dupré, architect, is now building on the site of the old Salpêtrière German market, a large building which is to be the hall for the examination of the students of the municipal schools. The principal facade is very simple. The interior arrangements are very good, with large well-lighted examination halls.—The jury on the open competition for a group of school buildings at Glichy has awarded the first premium to M. M. Durand & Bidard, the second to MM. Maistrasse & Berger, and the third also to them, by as they sent in two different designs. A medal was awarded to M. Bertone.—The exhibition of the Société des Amis des Arts of Angers will be held from January 15 till March.—A new room filled with furniture is being arranged at the Louvre. Amongst other things here is the Chinese furniture belonging to Marie Antoinette, toilet articles belonging to Mme. Du Barry, besides mirrors, mantelpieces, and carved woodwork belonging to the Hôtel de la Place Vendôme.—A metropolitan railway from Vincennes to the Bois de Boulogne is in process of construction at the west angle of the Place des Pyramides in the Rue de Rivoli. Great excavations had to be made, and the foundations of old statues built by Philibert Delorme for the King have been discovered. They date from the time of Catherine de Medicis. They were demolished subsequently, to make the Place des Pyramides. A large stone gallery has also been discovered, the use of which is unknown.—M. Eugène Barthélemy, architect, of Paris, has just died at the age of fifty-six years. He was a pupil of Constant Dupleix and of the Ecole des Beaux-Arts, and was a member of the Société Centrale des Architectes for sixteen years. Besides numbers of special works, such as hotels, &c., he gave the greater part of his laborious career to the Municipal Administration as Professor of Drawing in the schools and as Inspector of Architectural Works. He carried out the enlargement of the Ecole Normale d'Instituteurs, and the group of school buildings in Rue Geoffroy-Laisnez.

**AUSTRALIAN WATER SUPPLY.**—In all parts of Australia increased attention is being given to the question of water conservation, especially in Sydney, where the rapidly increasing metropolitan and suburban population has made a regular and copious water supply a matter of vital importance, the result being that at the present time the capital of New South Wales claims to possess the largest and purest water supply owned by any city of the same population in the world. The sources of supply are the waters of the Nepean, Cataract, and Cordeaux rivers, draining an area of 354 square miles, a catchment enjoying a copious and regular rainfall. The off-take works are built at a height of 437 ft. above the level of the sea, and the water flows through a series of conduits, partly tunnel, partly open canal, and in places wrought-iron aqueducts, to Prospect, a distance of 40 miles from the farthest source of supply. Here a storage reservoir has been constructed, covering an area, when full, of 1,261 acres, and capable of holding about 11,000 million gallons, of which nearly 7,000 millions are available for supply by gravitation. The top water-level is 105 ft. above sea-level. The dam is 7,300 ft. long, 30 ft. wide on top, and has a height of 84 ft. at the centre; it contains some 2,310,500 cubic ft. of earth-work; and its water face is covered with heavy bluestone pitching. The conduits above Prospect have a capacity of 150 million gallons per day, and for 10 miles below the reservoir the capacity of the canals and pipes equals a maximum of 50 million gallons, while for the last 11 miles the pipes have a capacity of 17½ million gallons daily. The water flows from Prospect to other large reservoirs in and around Sydney, one of these, situated at Pott's Hill, covering an area of nearly 25 acres, and having a storage capacity of 100 million gallons. Here the water passes through



a series of copper-gauze screens, and is then conducted by two mains into Sydney. The reservoir at Petersham, a Sydney suburb, is 166 ft. above high-water mark and has a capacity of 2,157,000 gallons. Another at Crown-street, in Sydney, has a capacity of 3,250,000 gallons. Other reservoirs have a capacity of about 1,000,000 gallons each. The total volume of water stored in these reservoirs is 106,770,000 gallons. This is exclusive of the water storage at Prospect. Recently a new covered reservoir, the largest in the southern hemisphere, has been completed at the Centennial Park, in Sydney. It covers an area of over 31 acres, and contains, when full, 18 million gallons. The depth of water above the draw-off level is 20 ft., and the top water surface is 245 ft. above sea level. The walls are of brickwork; the floor and partition wall of sandstone concrete, rendered with cement mortar. A special feature of this reservoir is the roof, which is constructed with groined arches of coke-cinder and cement concrete, supported by brick pillars 23 in. square and 20 ft. apart each way. This form of construction was decided upon as the most economical and suitable after many designs of various kinds of arched coverings had been prepared, and much consideration given to the matter. As the roof had to be designed not only to carry the protective covering of sand and turf, but also a possible dense crowd of people, it was necessary to make it unusually strong. The groined arches are, therefore, 6 in. thick at the crown and unequal loading they are connected throughout with wrought-iron ties. A salient reason for adopting the groined system was that free and thorough ventilation is effected in every direction, the hollow columns of the surrounding railing forming inlets, and the central towers lights for the air. The interior of the reservoir is lighted for cleansing purposes by sixty-four roof lights. Both ventilation and lighting are so carried out as to exclude dust and other atmospheric impurities. The ornamental railing, pavilion, footpaths, &c., were introduced with the view of the roof being used as a recreation ground, and preventing any injury from being done to the general appearance of the park, which was one of the conditions under which the site was granted. Practically a water famine is impossible in Sydney, although a succession of rainless years, a most improbable occurrence, might lead to restrictions being placed, as a matter of precaution, on the daily supply. The purity of the water is beyond question, and the greater portion of the city and suburbs being supplied by gravitation, the storage of water in house tanks is virtually unknown.

#### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—An arrangement has been made by which the private practice, established in Manchester in 1859 by the late Mr. William Radford, M.Inst.C.E., and carried on until recently by him in conjunction with his son, Mr. William Harold Radford, under the style of Messrs. William Radford & Son, Civil Engineers, Surveyors and Valuers, at 19, Brazennose-street, Manchester, has been transferred to Mr. Joseph Swarbrick, Assoc. M.Inst.C.E., of Temple Chambers, 33, Brazennose-street, Manchester, consequent upon the appointment of Mr. W. H. Radford to the position of Bridgmaster for the County of Lancaster, in succession to his father.

**ABERDEEN GRANITE TRADE.**—In view of the great falling-off in the granite trade of the city with the United States, we have pleasure in recording distinct increases in other branches of the industry. The following figures applicable to the exports from Aberdeen Harbour during the last financial year (ended September 30, 1898) bear out this, and it is otherwise known that a large amount of business has been done during the present year by the monumental works, chiefly in the way of making ornamental fronts for buildings in the large towns in England and elsewhere. Granite goods for America are shipped via Glasgow, but the statistics given below as to Aberdeen Harbour apply to exports for most places abroad, and also, of course, to such destinations as London, Newcastle, &c. The exports of stone from the port during the year mentioned may be summarised as follows: Of caseway stones there were exported 35,284 tons, being a rise of 3,881 tons upon the record for the previous year. As the average value of the stones may be taken at 11. a ton, the sett-making industry in this district is evidently still a considerable one. Then of kerb, pavement, and building stones there were exported during 1897-8 no less than 4,479 tons, being an increase of 2,243 tons over the figure for the year preceding. The total weight of chips, rubble, &c., exported was 14,616 tons—a rise of 3,399 tons. The exports of polished granite again amounted to 9,349 tons, an increase of 367 tons. This item is of importance, as the value of polished granite for elaborate work is probably 20s. per ton, while the average value for all grades of manufacture is more moderately estimated at 14s. per ton. Of granite waste slabs ("adamant") there was exported last year 2,898 tons—a rise of 1,058 tons over the previous year. The "boom" in the building trade in Aberdeen, it may further be remarked, is illustrated by the striking rise in the imports of timber, which for 1897-8 amounted in total to 78,359

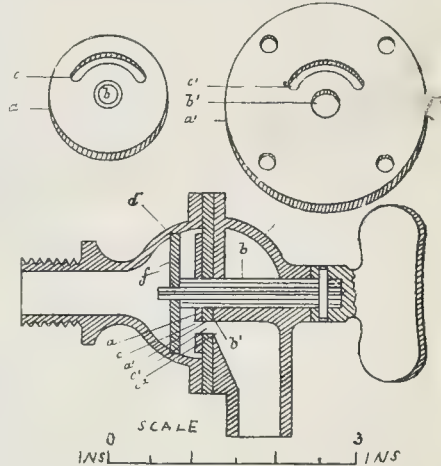
loads of 50 cubic ft. each, being a rise of 18,319 loads over the preceding year. The recent strike and lock-out at the local quarries do not seem to have affected the monumental trade. At least the imports of rough foreign granite were not materially altered. These amounted to 12,610 tons, being a fall of only 1,205 tons on the record of 1896-7. Most of this rough foreign granite comes from Norway and Sweden, and owing to the variety of colour available, it is largely used for the polished fronts above-mentioned, as well as for cemetery monuments for the United States.—*Aberdeen Free Press.*

**A NEW WATER-TAP.**—The patentee and inventor of this tap, Mr. W. Duthie Crabb, especially intends it as a durable hot-water tap. The accompanying diagram will only require a few words to explain the action of the tap: *a* is a revolving metal plate fixed to the spindle of the tap and turning with it; *a'* is a combination seating of indiarubber compound or fibre or compounds of other matter (the patentee says that he has found these the most favourable materials for the purpose) which is fixed, and the water-way is opened or closed by the coincidence or otherwise of the segmental openings in the metal plate and washer, on the hit-or-miss principle. A special feature, however, is the water-tight spring disc *f* (the perforations are not shown), which is fixed to the end of the spindle, and which is supposed to assist, by the pressure of the water on its solid portions, in keeping the rotating disc closely pressed against the washer, the water when the tap is closed, and thus keeping it water-tight. We should rather doubt the efficiency of the perforated disc in assisting in the pressure, which we are inclined to think would operate as much on *a* without the intervention of *f*, and would form an additional check on the water-way, which is rather throttled as it is. It will probably be objected also that, although the tap may very well be turned off slowly so as to close the water-way gradually, if turned off quickly, it will have the usual effect of cutting short the flow with a jar. The tap is however ingenious, and may be a step to some further improvement.

**THE LONDON COUNTY COUNCIL'S WATER SCHEME.**—In our "Note" of November 26 last (p. 477 ante) we commented upon this project. On referring to the Council's "London Water Aqueducts and Works" Bill we find that they propose to construct a storage and service reservoir at Borehamwood, Hertfordshire, between the Midland Railway line and the road from Elstree to Shenley, to be comprised between two embankments. The main aqueduct to that reservoir from a reservoir on the river Yrion, Brecknockshire, is planned to pass through Buntingford, Hay, (Brecknockshire), Madley, Blakeney, Tiberton, Harewood, Pencoyd, Ross (Herefordshire), East Dean, Newent, Hartpury, Maisemore, across the Severn, Sandhurst, Leckhampton, Churchdown, Cokerley, Chedworth, Stovell, Northleach Rural District (North Gloucestershire), Milton, Ascott, Charlbury, Heyford, Hethe (North Oxfordshire), Twiggick, Leamington, Bardsley, Mursley, Stewkeley, Drayton, Wing, Mentmore, Ivinghoe (North Buckinghamshire), Little and Great Gaddesden, Hemel Hempstead, Abbot's Langley, Shenley, Ridge, Aldenham, and Elstree (South Hertfordshire). Branch aqueducts from the termination of the main aqueduct will be made to Scratch Wood, Edgware, and thence to Selvaeg Lane, Hendon, with new roads in the Shenley, and Radlett districts. For filter-beds the Council propose to take lands in Edgware and Hendon, on the south-west side of the Midland line, between Borehamwood tunnel and Mill Hill station, and for purposes of the works to take portions of commonable lands at Cefn Gaeaf, 2 acres; Hay, 14 acres (Brecknockshire); 5 acres (Hertfordshire); 11 acres (Hertfordshire); Mitcheidean, 2 acres (Gloucestershire); Hardwick Heath, 1 acre (Oxfordshire); Ivinghoe, 9 acres; Hudnall, 8 acres; and Brickett Wood Common Meadows, 33 acres (Herts). The Bill empowers the Council to enter into contracts for supplying water to Local Authorities, companies, and other persons, within certain limits, along the routes of their aqueducts, to raise money by creating stock or annuities, or to use money standing to the credit of the Consolidated Loans Fund, for purposes of the Act, and to keep separate accounts of expenditure and revenue in respect of the undertaking.

**PROPERTY SALES.**—There are offered for sale (1) a freehold ground-plot of 5,500 sq. ft. per annum secured upon a block of flats, Bedford-court Mansions, with frontages to Bedford-avenue (formerly Caroline-mews) and Bloomsbury-street, covering an area of about 20,650 sq. ft. superficial. Bedford-court Mansions were built after the designs of Mr. Allan F. Vigers, in conjunction with Messrs. Martin & Pugh, and the building, on December 7, 1895, we published an illustration of the block

facing Tavistock-street (since renamed Bedford-avenue) and Charlotte-street. Some months ago a freehold ground-plot of 20,000 sq. ft. arising out of a portion of the estate was sold for, we believe, £2,000, the Duke of Bedford having disposed of the fee-simple of that portion of the property to the ground-lessees. (2) The estate of Hassendenburn, near Hawick, Roxburghshire, including four farms, extending over about 1,200 acres, in the parishes of Minto and Lilliesleaf. The mansion, rebuilt twenty years ago, after the plans and designs of Messrs. Wardrop & Reid, of Edinburgh, stands on the Teviot's north bank, and commands a fine prospect, southwards, of the river and dale. (3) By order of the mortgagees the premises, held for an unexpired term of thirty-two years, on the east side of Hanover-



square, at the corner of Hanover-street, occupied by the St. George's Club.

**STATUE, TIPPERARY.**—On the 27th ult. a statue of Charles Kickham was unveiled at Tipperary. The statue is the work of Mr. John Hughes, A.R.H.A., Dublin, and is of bronze.

**DRAIN TESTING.**—A meeting of the Royal Scottish Society of Arts was held in the hall, 117, George-street, Edinburgh, on the 28th ult. Professor W. Ivon Macadam, F.R.S.E., Vice-President, in the chair. Mr. Gilbert Thomson, C.E., Glasgow, read a paper on "A Suggested Standard for Drain Testing." Since the desirability of having an airtight system of house drainage was first recognised, many improvements had, he said, been made both in construction and in methods of testing. At present the standard of construction appeared to be rather above the standard of ordinary testing. The early tests, such as paraffin and peppermint, being only smell tests, did not indicate the exact position of any leakage, and had been superseded by the universally-known smoke test. That test, although very useful, had a serious weakness, in that it gave only a negative proof of soundness; and although it was very common to find it reported that drains had been smoke-tested and found all right, all that could really be said was that nothing was found to be wrong. This was not the same thing, and might be very different. In testing old work, it was perhaps the best that could be done, but for new work it was desirable to have a positive and not only a negative proof of soundness. Two such tests were available and frequently used—the water test and the air test. The latter was the more generally applicable, and might be made a standard to which all drains and pipes put in under building-by-laws might be made to conform. So far it had usually been applied in a rough-and-ready fashion, and even then was much superior to smoke. It could easily be made to give exact numerical results, and the suggestion was that by-laws and specifications should not stipulate in general terms that the work was to be satisfactory, but that it should stand an air-pressure of so many inches of water, and should retain it without perceptible loss for so many minutes. Mr. Thomson exhibited and illustrated an instrument designed to apply such a test.

**THREE TOWNS MASTER BUILDERS.**—At a recent meeting of the Plymouth, Devonport, Stonehouse, and neighbourhood Master Builders' Association (affiliated with the National Association, and also with the West of England and the South-West Federation of Building Trades Employers), it was resolved—"That the members of this Association do congratulate Mr. Alderman Pethick, J.P., on his election to the Mayoral chair, feeling assured that the dignity of the chief magistracy will by him be upheld with credit alike to the town and to himself. On the members feel especially proud in voicing their hearty good wishes to the Mayor, whose career has



been so long and honourably connected with the interests of the Association." It was further resolved—

That the following gentlemen be a deputation to wait upon the Mayor and hand him a copy of the foregoing resolution, viz.,—Messrs. W. G. Laphorn, Chairman; John Wakeham, Vice-Chairman; C. S. Tozer, Treasurer; A. N. Coles, Albert Lethbridge, and the Secretary, Mr. Gabriel. In accordance with this resolution the deputation waited on the Mayor on the 28th ult. Mr. Laphorn expressed the pleasure it gave him to introduce them to the Mayor, and the general gratification of the Association at the elevation of Mr. Pethick to the Mayoralty. He referred to the possibility that the meetings of the National Association of Master Builders might be held in Plymouth next year. The Mayor thanked them for the kindness of their words, and begged them to convey to the Association suitable acknowledgments. In reference to the possibility of which Mr. Laphorn had spoken, he would do his utmost for the comfort of the members of the National Association on the occasion of their visit to Plymouth.

**DUBLIN SOCIETY OF ANTIQUARIES.**—Some interesting papers were read at a meeting of the Society of Antiquaries, which was held on the 29th ult. in the Davison-street Hall of the Royal Irish Academy. Mr. Thomas Drew presiding. Mr. F. Erlington Ball, read a paper on "Some Residents of Monkstown in the Eighteenth Century," in which a good deal of information was conveyed as to the general state of the town as it was then, and more than a century ago. In reference to the possibility of some of the leading denizens of the Monkstown of that day. Mr. J. A. Musgrave, M.A., followed with a paper consisting mainly of extracts from the diary of William Bakley, a grand juror of the Isle of Anglesea, who flourished more than a hundred and fifty years since, and who resided at Boyadda, near Amlioch, in that county. Mr. P. J. O'Reilly read a paper on "The Island Monasteries of the Shannon." It was illustrated by from fifty to a hundred lantern slides.

**THE GLASGOW BUILDING EXCHANGE AND THE TECHNICAL COLLEGE.**—On the 2nd inst. Colonel Bennett gave the first of a series of monthly papers that have been arranged to be delivered under the auspices of the Glasgow Building Trades Exchange during the present winter. Colonel Bennett's paper was on the subject of "The relationship the Building Exchange ought to have to the Technical College." In the course of the paper he said that what he felt as to the training of the technical schools was that youths learned no doubt much good, but also a great deal of bad for want of adequate practical teachers. It was necessary to impress on apprentices that they must do the roughest or meanest kind of work before they acquired sound practical knowledge. Why was it that in this the boasted second city of the Empire they had been the last to provide sound technical schools worthy of the name? He blamed, first, the merchants; second, the Chamber of Commerce; third, the Merchants' House; fourth, the Trades' House, the City Fathers and themselves; and lastly, the workmen. "What was everybody's business was nobody's," and he denied emphatically that after twelve years' existence the high ideal set up by the founders of the Glasgow and West of Scotland Technical College had been reached. According to the statistics of the Technical College last year, over 216 plumbers attended the lectures, 112 attended the workshop classes, 202 the painting classes, and 316 the building construction classes. Would any one say that this was a fair proportion for the building trades of Glasgow? Yet if more had applied they would have had to be taught in the streets, as there was no accommodation. After dwelling on the excellent system of technical education in Germany, the Colonel continued that if we were to keep pace with the great Teutonic race, the sooner the whole community awakened from the Rip van Winkle policy they had been pursuing the better for the rising generation. As he had said, the whole community were to blame for neglecting the work that lay before them. What was the remedy? Let them at once build a Technical College worthy of the name, making it large enough to accommodate 20,000 students. Then let there be, so far as the building trades were concerned, a duly qualified set of practical teachers and a visiting committee sent from the Exchange—a committee, that was, of skilled and qualified workmen, who were willing to visit the school at least once a week to see that the boys were being taught on proper lines. He advised that the Education Committee of the Building Trades Exchange should take this matter up to put themselves in touch with the management of the Technical College and obtain, if possible, some share for the Exchange in the scheme of management.

**THE CARPENTERS' COMPANY.**—At the examination in building and sanitary construction held by the Carpenters' Company in their Hall last week, particulars of which we gave in our issue of November 26, thirty candidates entered, which is an increase on the numbers of the two previous years. The Company lay great stress on the practical nature of their examinations, and no candidate who is not a practical man is able to obtain the certificate. The following is a list of the successful candidates, arranged in order of merit:—T. Cherrill Way (Gold

Medal); F. Hartnoll, H. C. Remnant, Jno. Sanderson (Silver Medals); E. F. Brown, T. E. Kinch (Bronze Medals); A. Harrington, W. H. Masters, J. G. Anderson, C. Tinson, L. Bates, A. Norton, W. J. Andrew, S. W. Hayward, A. C. H. Pendlebury, C. R. Fenn, T. R. Tanner, Geo. Gout (Certificates).

**GENERATION AND PURIFICATION OF ACETYLENE.**—Last Monday Professor Vivian B. Lewes delivered the third of a course of four lectures on "Acetylene" at the Society of Arts. Owing to the large attendance some of the audience had to find accommodation in the vestibule adjoining the lecture-room. Professor Lewes confined himself in this lecture to the discussion of the various types of generator and of the methods of purifying the gas. He said that while some generators yielded fully 5 cubic feet of acetylene per pound of carbide decomposed, others yielded as little as 3½ cubic feet from carbide of the same quality; and that the yield from most of the generators now on the market varied within those limits. An important feature in connection with the generation of acetylene is the gas pressure which accumulates in the generator during the decomposition of the carbide. In some generators the gas pressure does not exceed from 2 in. to 4 in. of water, while in others it rose to 8 in. or 10 in. or even higher. As a general rule, the greater the pressure in the generator the less is the yield of acetylene per pound of carbide. An indication of the action which has taken place in the generator is to be found in the slaked lime formed by the decomposition of the carbide. If the lime is of a uniform white colour and free from hard lumps, the decomposition has, in all probability, proceeded in a satisfactory manner; while, if it is yellow, the heat developed within the mass of decomposing material has been too great, and some of the acetylene itself has been decomposed or polymerised. In some generators Professor Lewes had known the temperature above the melting point of zinc, and in such cases the waste lime was dark brown, or almost black, owing to the formation of tar substances, resulting from the polymerisation of some of the acetylene. With regard to the purification of the gas, Professor Lewes said that the white "haze" which was sometimes observed in a badly ventilated room in which acetylene was burning, was due to water condensed in the presence of phosphoric acid; and that if the gas was purified from phosphoretted hydrogen, no "haze" would be formed when the acetylene was burned. Professor Lewes remarked that there were several processes by which the gas could be purified, and showed a purifier in which cuprous chloride dissolved in hydrochloric acid was used. This, he said, would remove phosphoretted hydrogen, sulphuretted hydrogen, and ammonia; and another arrangement could readily be added which would dry the gas before it passed to the burner.

**EXHIBITION OF BUILDING TRADES' EXHIBITION.**—We are informed that the whole of the ground floor space for this exhibition has already been let, and more than half of the gallery accommodation. The exhibition will remain open for ten days instead of a week as previously, and a full week will be given for erecting exhibits. It is to be hoped that this readiness will be rendered complete by having the catalogue ready on the opening day. The exhibition is to open on April 26 and close on May 6.

#### LEGAL.

##### INJURY TO BUILDINGS THROUGH OSCILLATION OF TELEGRAPH POLES.

THE case of Christoffer and others v. the National Telephone Company, Limited, came before Mr. Justice Lawrence and a special jury on the 2nd inst.

Mr. Wm. Moyes appeared for the plaintiffs, and Mr. Moyes, in opening the case, said that Messrs. J. C. and G. J. Christoffer were the trustees under the will of the late Mr. Christoffer, the owner of the property in respect of which the action was brought. Mr. Wm. Barrett being the occupier of the property. The action was brought by the plaintiffs to recover damages for trespass committed by the defendant company entering upon, and for less a period than fourteen years, and which had caused damage to the plaintiffs, as they were under the impression that the Company, being termed "National," had something to do with the State, and had a right to do what they had done. It was only at the beginning of the present year that the plaintiffs became aware of their rights, and the writ in the action was issued on April 13. The facts were that no less than 546 wires in strands or cables passed over the plaintiff's house in Assam-street, Whitechapel. At the back of the house there were two huge poles, which were put into the ground to the depth of over 6 ft., one pole being put there fourteen years ago and one seven years ago. One pole was only about 12 in. from the back wall of the house in question, and the other about 40 in. These poles were subjected to oscillation during the wintry weather, and had a pernicious effect on the adjoining property. Three years after the first pole was put there, there appeared a rent in the wall. That rent had been stopped up two or three times, but it had reappeared again, and another mischief had been done. One of

the plaintiffs caused a letter to be written to the defendants asking for compensation for the wires passing over the property, but the defendants replied denying liability. Hence the present action.

Mr. J. C. and Mr. G. J. Christoffer gave evidence as to the damage to the walls of the house and the annoyance to the occupiers by the noise of the wires.

Mrs. Barrett, who had lived in the house eleven years, said the crack in the walls appeared after the poles were put there. She had then complained to the landlord as to the nuisance caused by the wires. The wall had given way and a ceiling had come down; also some of the doors were not close.

Mr. Walker Thomas Farthing, architect and surveyor, said that the damage done to the walls of the house, which he estimated at 45s., was caused by the oscillation of the poles.

Mr. Hitchcock, Surveyor and Engineer to the Vestry of St. George's, Southwark, gave similar evidence.

Mr. Roskill, for the defendants, said that he would call evidence to show that the cracks were in the wall fourteen years ago, and were much the same now as they were then.

Mr. L. H. Isaacs, Surveyor to the Holborn District Board of Works, gave evidence to the effect that the poles had nothing to do with the crack in the wall, and that the difficulty as to the doors not closing was due to subsidence.

Mr. W. E. Deane, an architect, said that his opinion was that the cracks were caused by settlement or subsidence.

In the result the Jury awarded the owners of the property 45s. and the occupier 5s. damages. Judgment accordingly.

##### ANCIENT LIGHT DISPUTE IN CLERKENWELL.

THE case of Anobus v. Dalton came before Mr. Justice North in the Chancery Division on the 2nd inst., on a motion by the plaintiff for an injunction to restrain the alleged interference with ancient lights at premises in John-street, Clerkenwell.

The plaintiff by notice of motion also asked for a mandatory injunction to compel the defendant to pull down what had been erected. Mr. Henry Ferrell, Q.C., for the plaintiff, however, stated that it was arranged the case should go to an independent surveyor, and that his client would waive his claim for a mandatory injunction and substitute one for damages.

It was ultimately arranged that the whole question, together with all the costs, should be referred to a surveyor to be agreed upon between the parties, and in default of their agreeing, that his lordship should nominate a surveyor.

Mr. Micklem, for the defendant, said that the course suggested by his learned friend seemed the right one to pursue. Order accordingly.

##### LIGHT AND AIR CASE.

THE case of Barclay v. the Wakefield Corporation came before Mr. Justice Romer in the Chancery Division on the 2nd inst., on a motion by the plaintiff to restrain the defendants from interfering with the light and air coming to his premises. There was the usual conflict of evidence, and in the result it was agreed to allow the motion to stand till the trial.

Order accordingly.

##### ANCIENT LIGHT DISPUTE IN RED LION-STREET, HOLBORN.

THE case of Savage v. The Wenlock Brewery Company came before Mr. Justice Romer in the Chancery Division on the 30th ult., it being an action brought by the plaintiff, the lessee of a draper's shop in Red Lion-street, Holborn, for an injunction to restrain the defendants from obstructing his ancient lights. He also asked for a mandatory order and for damages.

Mr. Neville, Q.C., and Mr. Hamilton appeared as counsel for the plaintiff; and Mr. Levett, Q.C., and Mr. Lawrence for the defendants.

Mr. Hamilton said that the plaintiff had had his shop for over fifteen years, and he claimed to be entitled to ancient lights in respect of four windows and one basement window.

Mr. Levett, in reply to his lordship, did not dispute that the lights in question were ancient.

Mr. Hamilton, continuing, said that on the site of the defendant's building now complained of, there formerly stood a public-house, which was pulled down some three or four months ago. There was very little dispute as to the facts. The width of the street, according to the plaintiff's evidence, between the two buildings was 28 ft. The height of the defendant's old building was 29 ft. 3 in., which, with a parapet, made it 31 ft. 9 in. The defendant's figures, however, made it 33 ft. high altogether. The defendant's new building was 37 ft. 9 in. high, and with the dormer window it was 41 ft. 9 in. According to the defendant, the height of the building altogether was only 45 ft., so that there was substantially very little difference between the parties as to the measurements.



In the result, his Lordship directed that the case should stand over so that some independent expert, to be named by the President of the Surveyors' Institution, should inspect the buildings and report to him whether there was any substantial interference with the light, and if so, the amount of damages. There would be no order as to costs until he had heard the report of the surveyor. His Lordship also said that the parties must agree to accept the surveyor's report as final.

#### ARBITRATION CASE UNDER THE WORKMEN'S COMPENSATION ACT.

MR. R. W. PERKS, the Government Arbitrator under the Workmen's Compensation Act, sat, on the 2nd inst., at the Law Institution's Rooms, Leeds, to assess the compensation due under the Act in the case of one Sarah Ann Wood, the widow of John Wood, a painter, lately residing at 7, Mario-place, Beeston-hill, Leeds. The respondents were Messrs. William Walsh & Sons, painters, of Leeds. Mr. Hart, solicitor, appeared for the respondents, and Mr. Arthur Willey appeared for the claimant.

Mr. Willey said that claimant, who was an old employee of Messrs. Walsh & Sons, was on September 21 employed on a building in Guildford-street, occupied by Potts & Sons. He was filling in cracks in woodwork and plaster with a mixture of putty, &c., to make a smooth surface, and was also painting. He was actually painting on a ladder, and a rotten rung breaking, he fell to the ground and sustained a fracture of the skull, from which he died almost immediately. Mr. Willey contended that scaffolding was being used on the job, and that his case came within the clause of Section 7 of the Act.

Mr. Hart said his points were that no scaffolding was being used, that the building was not being repaired (*i.e.*, that painting is not repairing), and that consequently claimant did not come under Section 7 of the Act.

A long argument followed, in the course of which Mr. Willey urged that painting was repairing. Quoting Nuttall's Dictionary, he said, "repair" was defined as "to restore to a sound or good state after decay; to rebuild a part decayed; to make amends or indemnify for a restoration to a sound state; reparation." He added that it could not be believed that the Act contemplated excluding such a case.

Mr. Perks: We know enough of this Act, I think, to know it is a very curious one.

Mr. Willey said he should prove that there was scaffolding being used, but he should suggest that a ladder was being used.

Mr. Perks said he would give a ruling as to scaffolding. A scaffold implied a stage or platform of some sort. A ladder, he held, was not scaffolding.

Mr. Willey then called two of the workmen who were working at Messrs. Potts' premises with deceased. One witness named Stead said he was painting, and had planks tied to his ladder, and run on to a window sill. This, said witness, was a scaffold. He had had more than thirty years' experience as a painter, and such a platform was always called a scaffold, and was, in fact, a scaffold.

Addressing the Arbitrator for the respondents, Mr. Hart, who called no witnesses, said the defence was that there were no repairs being executed; that a ladder was not a scaffold; and that there was no evidence of scaffolding within the meaning of the section. Alternatively, he said, that assuming that there was scaffolding, the deceased was not working on the scaffolding, and was not entitled to come under the Act.

The Arbitrator, in giving judgment, said with regard to the facts, he only had to decide whether there was a board through the ladder and on the window-sill. He found that there was. Was the putting and plastering repairs within the meaning of the section? He thought not. With regard to the scaffolding, he thought also that something more substantial was contemplated by the Act. He found for the respondent with costs.

Mr. Willey asked the Arbitrator to state a case for the County-court Judge. Mr. Perks promised to do so.

#### THE WORKMEN'S COMPENSATION ACT.

At the Southwark County-court, on the 5th inst., Ernest Ewington, a bricklayer's labourer, claimed compensation from Mr. Goodall, builder, of Stoke Newington, in respect of injuries plaintiff had sustained whilst at work at a building in Magdalen-street, Bermondsey. Mr. O'Connor was counsel for the applicant, and Mr. Mallinson represented the respondent.

Mr. O'Connor said that on October 28 the applicant was at work at the building for a sub-contractor to respondent, named Ward. Whilst holding two hods to be filled, a large piece of wood fell on his head, causing a severe scalp wound, shock to the system, and defective sight. Applicant had not yet recovered sufficiently to go to work. The defence would be that the building was not 30 ft. in height when the accident happened.

His Honour: The very first case I tried under this Act depended on that point. The applicant's advisers argued that although the building was not 30 ft. where the accident occurred, yet it was intended to be raised to 60 ft. After a long argument I was compelled to find that the building must have reached 30 ft. at the time of the occur-

rence to enable an injured workman to recover under the Act, and the Court of Appeal upheld that.

Mr. O'Connor: You will find a new point in this case, which is as to where the building is measured from, whether from the base of the foundations or the basement level.

The defendant's evidence and the plans put in showed that the building at the time of the accident was 26 ft. from the basement level, and 35 ft. 6 in. from the base of the foundations.

Mr. O'Connor: I submit that this building was more than 30 ft. high within the meaning of the Act. His Honour: The foundations can't be included, because they are excluded by the words of the Act. According to you, Mr. O'Connor, if a building was only 5 ft. high and the foundations 25 ft., your client would be entitled to compensation.

Mr. O'Connor: The foundations have to be built, and they are part of the height of the building.

His Honour: I hold that the Act does not mean the foundations to be taken into account in reckoning the height of a building. It is to be reckoned from the basement level. I therefore find for the respondent on the ground that the building was not 30 ft. high. I wish to add that it is amazing to my mind that people should have put into this Act anything so mischievous as this appeal case.

Here is a case in which a man has been injured. He has been out of work in consequence of the accident, and under the Act, if he were entitled to anything at all, I should have to first of all take off two weeks of the five for which I could give him nothing, and then for the other three weeks all I could award him would be 45s. for the three weeks, which is half his ordinary wages. I certainly could give a few shillings more if the Bill was allowed to be amended in Parliament, either party can go to the Court of Appeal. I have some feeling in this matter, because I do my utmost to keep the expenses of the Court down, whilst this Act allows such oppression, not only of the poor but the rich too, by allowing persons the luxury of going to the Court of Appeal where such a small amount is involved.

Mr. Mallinson: I was in the first instance heard before the Court of Appeal, and in that half a dozen statutes had to be gone through in order to find out if the applicant was entitled to compensation. Judgment was entered for the respondent, but no costs were asked for, and Mr. Mallinson intimated that his client was willing to give the man work.

#### ACTION ON A BUILDING CONTRACT AT MANCHESTER.

AT the Manchester Winter Assizes, on the 21st ult., in the Crown Court, the case of Mellor v. Grain came before Mr. Justice Phillimore and a common jury. Mr. Woodroffe Fletcher and Mr. Pilkington Turner appeared for the plaintiff, and Mr. Bradbury and Mr. M'Keever for the defendant.

Mr. Fletcher said the plaintiff was Mr. Alfred Mellor, builder and contractor, Openshaw, and the defendant was Mr. Edward Grain, locomotive engine driver, Openshaw. The claim was for £106. 8s. 4d., the balance due under a contract for the building of four houses in Sandwell-street, Openshaw. With regard to the main part of the claim the defendant said that the plaintiff had not done the work in accordance with the specifications and the by-laws of the Manchester Corporation, and he counter-claimed for the expense he said he would be put to in making the work good. The defendant had, after a lapse of two years, enumerated a large number of cases in which he said the specifications had not been fulfilled, and three in which the Corporation by-laws had not been complied with, but even assuming that these allegations were well founded, the plaintiff contended that the defects were of such a trivial character that an expenditure of 15s. would set everything right.

Mr. Alfred Mellor, builder, Fairfield, the plaintiff, in the course of his evidence said that the specifications and by-laws were carried out, except where he deviated from the plans at the defendant's request. Everything necessary could be done for 7l. 10s. In cross-examination the plaintiff said the party walls were not carried up to the slates, as they should have been. The houses in question were built up to some other houses which belonged to the defendant. The gable wall of the old houses was a 4½ in. wall, and although on the plan for the new houses a 9 in. wall was shown, he did not build a new wall up to the 4½ in. wall. He saw the plans before they were sent in.

Mr. C. H. Mellor, architect and surveyor, Manchester, a former clerk to the Openshaw Local Board and Chairman of its Building Committee, said he drew up the specifications and the plans. They were approved of by the defendant and passed by the Corporation. In cross-examination, the witness said the contractors' price would include the making of the 4½ in. wall into a 9 in. wall. The work could have been done at first for 10s. or 12s., but it would now have to remain a defect. The

Manchester by-laws required a party-wall to be carried up to the roof.

Mr. W. H. Aldred, architect and surveyor, formerly in the service of the Manchester Corporation as an inspector of property, said the work which was the subject of this dispute was generally satisfactory. In several cases where fireplaces already existed the Corporation had allowed old walls to remain at 4½ in. Apart from this question of the walls, 15s. or 16l. would cover the defect.—Cross-examined by Mr. M'Keever, the witness said that in some cases a 4½ in. existing wall had been passed by the Committee, but since the new by-laws came into operation a 4½ in. partition wall between new houses had never been allowed.

Other witnesses having been examined, Mr. M'Keever, on behalf of the defendant, called a number of witnesses to show the cost to which his client would be put in making the property what it ought to be.

Mr. Hibbert, builder, Moss Side, estimated the amount at 150l.

Mr. Farlane, another builder, considered that it would be impossible to make the houses all right.

Mr. E. J. Thompson, architect and surveyor, Dickinson-street, Manchester, said the cost of necessary alterations would be 122l., and the property, the contract price for which was 702l., exclusive of some extras, would not bring more than 700l.

The Judge, in summing up, said the suggestion made on behalf of the plaintiff was to the effect that he undertook if he could to run this matter through without the Corporation opposing—that if the Corporation insisted the contractor would put up the required wall. This was a very discreditable story, if it was the Mellor's, and it was not, and it was also discreditable that the Corporation officers never detected it. It was put forward by the Mellors, in fact, that it was the duty of the Corporation's inspectors to see that they put up a 9 in. wall, and that if the inspectors did not come down upon them they were entitled to avoid doing so. One of the defendant's witnesses said there were times when a deviation was allowed, but here nothing of the kind had been done. The plan was sent in with a 9 in. wall, and this seemed to show great carelessness on the part of the Corporation and great blame on the part of the plaintiff. He thought the jury ought to allow damages in respect to this gable wall, and that something must come off for not building the three party walls up to the roof.

The jury, after a short consultation, returned a verdict for the plaintiff for 66l. 8s. 4d.—practically, as the Judge remarked, knocking off 50s. in respect of the counter-claim.—*Manchester Guardian*.

#### THE WORKMEN'S COMPENSATION ACT.

THOMAS MELLOR, a bricklayer, applied to his Honour Judge Shand at Liverpool County Court on the 25th ult. for an arbitration under the Workmen's Compensation Act. Mr. Segar, instructed by Mr. Lyseney, appeared for the applicant, and Mr. J. H. Kenion for Messrs. James Tomkinson & Co., contractors, representing the defendants.

The facts, as stated by Mr. Segar, were that the plaintiff, who is thirty-five years of age, was employed by defendants in the erection of a new warehouse, Vauxhall-road, at a wage of £1. 19s. 8½d. per week. On August 16 last he was engaged trimming a blue brick when a piece of the brick struck him in the eye, injuring it so badly that it had to be removed. The sight of the other eye was affected, and he had not since been able to resume his employment. The claim was based on the 7th section of the Act, which is as follows:—

"This Act shall apply only to employment by the undertakers as hereinafter defined, or in or about a railway, factory, mine, quarry, or engineering work; and to employment by the undertakers as hereinafter defined, in or about any building which exceeds 30 ft. in height, and is either being constructed or rebuilt by means of a scaffolding, or being demolished, or on which machinery driven by steam power or other mechanical power is being used for the purpose of construction, repair, or demolition thereof." He admitted that in this case, the wall not having reached the height of 30 ft., he could not claim under that part of the clause; but as there was a large derrick in use on the works at the time, he submitted that the case came within "engineering work," which was defined in a sub-section of Section 7 as follows:—"Engineering work means any work of construction, alteration, or repair of a railroad, harbour, dock, canal, or sewer, and includes any other work for the construction, alteration, or repair, of which machinery driven by steam, water, or other mechanical power is used."

Mr. Kenion submitted that work of the nature involved in this case was clearly out of the purview of the Act, that it was the erection of an ordinary building, the walls of which had not reached the height of 30 ft.; that a derrick could not be classed as machinery in the ordinary sense, or in the sense intended by the Act, and that therefore plaintiff could not recover.

According to the medical evidence the plaintiff was now able to work again, though he could not be as good as when he was injured.

His Honour was of opinion that as far as the question of law was concerned the work this man was engaged in came under the head of engineering



work, as defined by the 7th section and sub-section because it was a work of construction in which mechanical power was employed. Therefore he was entitled to the plaintiff was entitled to compensation, and he awarded him 50 per cent. of his earnings, or 19s. 9d. a week from August 30 to November 20, and 7s. 6d. a week during partial disablement.—*Liverpool Mercury.*

MEETINGS.

FRIDAY, DECEMBER 9.

*Royal Institute of British Architects.*—Annual Dinner, to be held at 7.30 p.m. in connexion with the Birmingham Architectural Association, at the Grand Hotel, Birmingham. The President, Professor Aitchison, R.A., will hold a reception at the Rooms of the Society of Artists between 5 and 6 p.m., and a short business meeting will be held immediately afterwards, and before the dinner.

*Architectural Association.*—Mr. Edwin T. Hall on "The Position of Architecture among the Fine Arts." 7.30 p.m.

*Institution of Junior Engineers (Westminster Palace Hotel, Victoria-street).*—Mr. E. A. Heath on "British Cable Tramways and their Construction." 8 p.m.

SATURDAY, DECEMBER 10.

*British Institute of Certified Carpenters.*—Visit to the Charterhouse, 3.30 p.m. Annual Meeting at Carpenters' Hall at 6 p.m.

MONDAY, DECEMBER 12.

*Surveyors' Institution.*—Mr. W. Weaver on "The London Building Act and the Official Supervision of Buildings." 8 p.m.

*Society of Arts (Cantor Lectures).*—Professor Vivian B. Lewes on "Acetylene." IV. 8 p.m.

TUESDAY, DECEMBER 13.

*Institution of Civil Engineers.*—Paper to be discussed: "The Ventilation of Tunnels and Buildings," by Mr. F. Fox. 8 p.m.

*Sheffield Society of Architects and Surveyors.*—Mr. Beresford Pitt on "Michelangelo's Architecture." 8 p.m.

WEDNESDAY, DECEMBER 14.

*Society of Arts.*—Sir Albert Rollit on "Commercial Education." 8 p.m.

*Edinburgh Architectural Association.*—Mr. E. Forbes on "The School of Applied Art Studentship & a Sketch of the Work in Gallows." 8 p.m.

*Edinburgh Architectural Society.*—Mr. G. Balfour on "Electric Lighting." 8 p.m.

*Liverpool Engineering Society.*—Professor H. S. Hele-Shaw on "Further Experiments on the Character of Fluid Motion." 8 p.m.

*Northern Architectural Association.*—Mr. G. E. R. McAdam, of Berwick, on "The Effects of Frost and Heat on Plumbing Work." 7.30 p.m.

THURSDAY, DECEMBER 15.

*Society of Antiquaries.*—8.30 p.m.

*Institution of Electrical Engineers.*—8 p.m.

FRIDAY, DECEMBER 16.

*Architectural Association: Discussion Section.*—Mr. S. W. Cranford on "Buildings for Secondary and Technical Education." 7 p.m.

*Edinburgh Architectural Association.*—Mr. W. H. Baxter on "Shoring and Slipping." (2) Mr. John Bowman on "Difficulties with Foundations." 8 p.m.

SATURDAY, DECEMBER 17.

*Sanitary Inspectors' Association.*—(1) General Meeting at 6 p.m., when a Paper will be read by Mr. W. H. Grigg. (2) An Extraordinary General Meeting at 8 p.m., when the following resolution will be submitted on behalf of the Council:—"That the number of members in the Association shall be increased by the addition thereto of seven hundred (700) members beyond the present registered number."

RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until January 16.

[1897]. 25,709.—VENTILATORS FOR DRAINS AND SEWER PIPES: *J. C. Shevell & W. R. Clark.*—The invention consists of a metal case having a movable back deeply recessed into the case. The upper portion of the recessed back contains a horizontal valve; the case's lower part is connected to the drain pipe by a pipe; an influx of air into the drains lifts the valve and passes into the case, then down the drain pipe. Foul air cannot escape on account of the closing of the valve.

26,002.—FURNACES FOR THE DESTRUCTION OF TOXIN REFUSE: *C. Watson.*—For an improvement in the method of introducing the charge, without affording an outlet for smoke for any undue length of time, is devised a furnace for bringing the refuse thereto in wagons having a deck for receiving the refuse, and the refuse is carried by means of drawing air through the deck-house to prevent effluvia from escaping. Between each pair of back-to-back furnaces is a large feeding hole, common to both, extending downwards from the top or deck, and so arranged that the refuse falls either on to the fire or into such a position that it may be easily dragged forward on to the fire. The feeding hole also forms a storage for refuse within the furnace.

26,530.—APPARATUS FOR HEATING BUILDINGS, &c., BY MEANS OF HOT FLUIDS OR ELECTRICITY: *J. A. Dargatzis, E. Griffiths, & C. H. Wright.*—To admit of the faces of the radiator, set of coils, coils, or batteries, being continually kept clean, and to provide ventilation when the radiator is in use, a receiving plate for the radiator is formed near the bottom of the radiator. It can be lifted in or out, or work upon an axis, and can be made to tip the dirt into a settling place or be fitted with a cleaning device.

26,886.—INSPECTION AND SIMILAR CHAMBERS FOR DRAINS: *The Abdon Clay Company and A. W. Bird.*—The chamber comprises a bottom having a sewage outlet,

and an upper part having one sewage inlet, or more, joined to the bottom part so that the relative angular position of all the parts may be varied, the uppermost part having a square top. The parts are mounted upon one another by flange and socket joints, so that they can be turned or angularly displaced, and as the outlet from the gully is formed on the bottom part, and the connections for the inlet pipe or pipes are in the piece or pieces mounted upon the bottom part, by rotating or displacing the pieces, the connection can, by operating or displacing the pieces, be brought into any desired position without disturbing the position of the outlet. The invention is equally applicable to receptacles into which drain-pipes enter.

29,250.—CONNECTING OR COUPLING WATER PIPES, &c.: *H. Saunders & J. Barker.*—The inventor employs two collars, with projections, and with taper holes through the collars and projections, to take the pipe's ends, the collars being also provided with holes to take threaded bolts, a ferrule, with both its ends tapered, is placed within the two ends of the pipe. In making the connexion, the two collars are placed on the two ends of the pipe, whose ends are enlarged to fit the taper holes in the projections on the collars, and the ferrule is placed with its ends in the two ends of the pipe, and the collars are then tightened up by means of the bolts. For angle joints, a collar having two ferrules in one T-shaped casting or piece may be used, one ferrule projecting out of one side of the elongated one connected to the other ferrule being an angle collar connected to a neck projecting from the collar's other side.

29,254.—MEASURING VERTICAL AND HORIZONTAL ANGLES FOR SURVEYING, AND OTHER PURPOSES: *F. N. Smith.*—A semi-circular scale has its edge suitably graduated, at a point over the centre from which it strikes the arc of the base is pivoted one end of a flat arc whose lower edge can travel along a plane at a distance above the base's edge, the flat arc is graduated, and from near one end to near the other end for a runner carrying a pointer, the pointer indicating the angle on the flat arc; to the runner is attached an end of a telescope turning vertically on pivots supported above the base's centre; an arm extending to the edge is pivoted to the base's centre and moves between the collars. For angle taking, the vertical arc's lower end is placed in the slot, and the runner is moved to indicate the angle on the flat arc; to the runner is attached an end of a telescope turning vertically on pivots supported above the base's centre; an arm extending to the edge is pivoted to the base's centre and moves between the collars. The glass being towards the index glass reflecting half of the horizon glass is parallel to the index arm when the latter is at zero.

29,263.—PACKER FOR WHITE LEAD, COLOURS, GLAYS, AND OTHER DRY MATERIALS: *R. F. Jones.*—The novelty lies in contriving that the shaft, with rammer attached, shall be lifted at each stroke the entire length of the throw of the cam, and shall always begin its rise from the position it has taken upon the material beneath.

29,352.—VENTILATING HOUSES, SHOPS, &c.: *H. Green.*—Holds in a perforated grid which is fixed in the ceiling communicates with the underdrainage of the floor, above the grid is a closed passage or conduit (which may be composed of two of the floor beams) communicating with an outside tube, or proceeding upwards directly to the highest point in the roof, or discharging into a hopper on the roof.

29,365.—VENTILATION OF BUILDINGS: *S. M. Rutkayev.*—The invention consists of a double element with an intervening space, the windows of the two elements may be hinged, or may slide in grooves; when the lower windows of the outer casing and the higher windows of the inner casing are opened, the amount of ventilation may be regulated and its velocity diminished by making the openings in the outer casements not so large as the openings in the inner casing, so that the direct draught is prevented, and in fine weather all the windows may be opened, the contrivance may also be applied to doors, gates, or ventilating panels.

29,368.—PARQUET FLOORING: *E. Quinlan.*—The claim is for a parquet flooring wherein the various panels are at certain angles to the direction of the fibres of the wood, in such a manner that the strains arising from pressure, tension, or expansion, are not mutually balanced, so as to ensure durability and economy. To avoid a short length of grain at the two opposite corners of the panels, which might cause the panels to warp, one of the corners and in fine weather all the windows may be opened, the contrivance may also be applied to doors, gates, or ventilating panels.

[1898]. 102.—FIRE-PROOF DOORS: *J. H. McGrouther.*—To prevent the door from buckling or warping under the influence of heat, it is constructed of a built-up framework, with sufficient lateral strength to give the necessary support with panel spaces for the fitting therein of loose plates having sufficient clearance to let them expand under the influence of heat.

219.—VARNISH, SPECIALLY APPLICABLE FOR GIVING A FROSTED APPEARANCE TO GLASS, TALC, &c.: *Blundell, Syme, & Co., and S. Hill.*—For a varnish that, though clear and transparent when applied, shall become semi-opaque or crystalline on drying, and when applied to glass, talc, or other transparent material, and for covering or varnishing paint to the same end. The inventor uses a pale varnish, say three parts, in which are dissolved resins and stearates of lime, lead, and manganese, adding thereto tincture of oil, say one part, with a small quantity of essential oil, and using one part of the varnish.

1,213.—WINDOW FRAMES AND THEIR SASHES: *J. Craig.*—That the sashes may be folded to the inside, each of the pulley stiles is hinged, its inside to form a check or stop for the bottom sash, as the parting bevels are checked back to the flush of the face of the stiles at the outside from the centre of the meeting rail downwards, thus the top sash, when lowered to the bottom, can be folded inwards. To enable the bottom sash to fold likewise, the inside bevels are cut at a point a little above the meeting-rail, the parts are securely fixed, and the bottom parts may be hinged or secured with a pinning screw. Four small grooved wheels are secured to the stiles, one on each pulley in the centre of the rails, and one at each point where the inside bevels are cut, the wheels serving as guide pulleys for the sash cords.

14,370.—WOODEN FLOORING AND PAVING: *Mark Packer & Co.*—In the opposite corners of each rectangular block are formed grooves at an angle of 45 deg. to the block's side or end, and in putting the blocks together continuous wooden or metal tongues, laths, or strips are inserted into the depth of the grooves, which can be the block can be inverted, or the grooves may be nearer the under-side, so as to leave more wood above for wear.

17,466.—WOOD BLOCKS, STAIRS, OR PIERCES FOR USE IN PARQUETRY AND OTHER FLOORING, AND MACHINES FOR USE IN THEIR MANUFACTURE: *E. Zaffert.*—The

blocks are fashioned with dove-tailed or similar grooves across their upper surface, for receiving correspondingly shaped strips of wood. The machines comprise two cutter-shafts arranged at an angle to one another, and mounted the one behind the other, and bearing bevelled or similar cutters or saws, which can be adjusted in position as may be desired.

18,995.—SELF-LOCKING FLOORING BLOCKS, TILES, &c.: *A. J. B. Ward.*—The inventor makes two differently shaped blocks, one with a bulge on the top and right-hand side and a hollow on the bottom and left-hand side, and the other with a bulge on the top and right-hand side and a hollow on the bottom and left-hand side; the blocks may also be grooved, and the tiles can be keyed with practically no waste of material, and metal or wood dowels are dispensed with.

19,939.—ELECTRICAL METERS: *C. D. Haskins.*—The improvements consist of (1) the combination of an armature in shunt to the mains and field coils in series with the load, with a starting coil also in series with the armature and in shunt to the mains, and means for changing the current flow in the starting coil without affecting that in the armature circuit; (2) the combination of a field coil in series with the work, an armature wherein a sensibly constant current is to be maintained, connected across the mains, a starting coil in series with the armature and with an auxiliary high resistance, two resistances, one in series with the coil, the other in shunt thereto; a meter, comprising a meter by changing the current flow in the starting coil to compensate for local errors without changing the current flow in the armature circuit.

20,322.—DOOR OR WINDOW HINGE WITH LUBRICATING CHAMBER: *C. Hagerkorn.*—The oiling occurs whenever the door or window is opened or closed; the hinge pin is depressed whenever the door or window is opened by a pin in order to uncover for a short interval the opening of the lubricating reservoir, the piston of the last-named is displaced—when the door is moved by the action of the pin, the guide in such a manner that the lubricant is fed against the frictional surfaces of the hinge; when the door is closed, the openings in the bottom of the reservoir coincide with the oil ducts or grooves of the hinged pin.

NEW APPLICATIONS.

November 21-6.

24,601, Keeble & Innes, Making Cambridge Portland Cement from Chalk and Marl. 24,493, J. H. Exley, 24,507, W. Ellen, 24,597, A. W. Sandercock, 24,623, Newman & Critchley, 24,624, O. Falbe, 24,702, R. W. Spittlehouse, 24,785, Bailey & Nicklin, 24,866, Dickson & Wallace, 24,953, L. Morris, 24,978, J. Levens, and 25,616, A. Schwab, Acetylene Gas Generators. 24,932, W. F. Purification of Town Sewage, 24,504, W. F. Simpson, Gas Stoves, 24,519, Rockhills, Hot Air Stove Settings. 24,519, C. Oppermann, Electrical Accumulators. 24,515, Shellhammer & Garner, Tool Holders. 24,549, E. Humayer, Mosaic Pictures. 24,556, A. Skeffington and Others, Smoke Consuming Furnaces. 24,557, R. Pringle, For increasing the Heating Efficiency of Flames produced by the Combustion of Gaseous or other Fuel. 24,566, G. C. Fricker, Opening and Closing Electrical Circuits. 24,622, J. W. Gifford, Refuse Destroyers. 24,590, J. Simpson, Blast Diffuser Valves. 24,629, G. B. Thornton, "Door-silencer." 24,603, Mason & Wilson, Brick, Pottery, and other Kilns. 24,604, W. Holmes, Automatics for the Fire Organ. 24,608, J. J. gradient Indicator. 24,617, W. H. Bonn, Rotor, Clamp. 24,613, J. R. Bell, Graft Dredgers. 24,627, S. Bandrowski, Artificially, Due to 24,659, J. D. Peck, Artificial Asphalt. 24,615, Benville & Murfitt, Polishing Compounds. 24,618, H. Aymer, Miners' Drills. 24,657, A. Wacht, Vice. 24,661, J. Brockie, Turning Lathes. 24,674, E. P. Bainbridge, Cabinets, Desks, and General Furniture. 24,680, E. Burrows, Boring Bits. 24,683, N. Shaw, Drilling Machine and Loam Moulds used in Dry Sand Castings. 24,694, P. E. Elliott, Regulating the Flame in Stoves or Lamps for Lighting or Heating Purposes. 24,695, P. Maché, Acetylene Safety Miner's Lamp. 24,698, S. A. Hazlewood, Stoves or Ranges. 24,705, T. W. Ford, Emptying Lavatories, Wash-basins, Baths, Sinks, and Urinals. 24,708, W. K. Ouley, Drainage Chimney Pipes for Preventing Down Draughts. 24,720, R. H. Hamilton, Sewer and Drain Pipe Joints. 24,727, W. A. Price, Electricity Measures. 24,739, J. W. Bowley, Fire Grates and Heating Stoves. 24,745, J. W. Brown, Instrument for Facilitating Trigonometrical Measurements with other Calculations. 24,769, G. Campanato, Decorative Articles of Wood, Metal, Stone, Glass, &c. 24,763, Phillips & Pring, Roller Mills suitable for Grinding Mortar, Clay, &c. 24,771, F. W. Lancaster, Gas Generators. 24,772, H. Salisbury, Carbide Holders and Accessories. 24,783, W. Oates, Sanitary Manholes for Horses and Cattle. 24,783, Jacks, 24,831, J. Webster, and 24,894, R. H. Dunn, Window Cleaning and Similar Devices. 24,895, G. D. Innes, Caving the Buffer Holes in the Metal Pedestals of Water-closets. 24,789, R. W. McDonald, Lavatories and Two-piece Closets. 24,790, E. Barker, Window Sash Suspender and Cord or Line Holder. 24,792, S. H. Brierley, Syphon Cistern and Window Waste Preventer. 24,800, H. Davison, Window and Similar Sash Fasteners. 24,812, R. E. B. Compton, Electrical Meters. 24,813, G. W. Mitchell, Automatic Weather Strip for the Bottom of Doors. 24,829, H. Callow, Sliding Window Sashes and Frames. 24,835, B. J. B. Roberts, Burglar Alarms. 24,861, W. A. Webster, Chain Saw Guards. 24,866, C. Jansen, Boring Holes in a Single Operation. 24,869, W. K. Ouley, Copper Furnaces, Doors, Grates, or Flues. 24,902, Bändel & Klimke, Catch Apparatus for Hoists. 24,912, C. S. Bradford, Lamp, Gas, and Electrical Fittings, &c. 24,919, J. H. Dierickx, Closing Devices, such as Doors, Shutters, &c. 24,921, G. H. Sheaf, to facilitate Drawing from Models, Making Machines. 24,923, M. E. Austin, Brick, Making and Painting Compositions. 24,936, G. P. W. Richards, Soldering Iron. 24,936, C. H. Martini, Closets, Urinals, and similar Sanitary Arrangements. 24,940, T. E. Hewitt, Locking and Unlocking Emergency Egress Doors. 24,941, O. Howl, Drying Bricks, &c. 24,946, H. E. Oesterling, Optical Projection Apparatus. 24,950, W. Nicholson, Pivots for Swinging-sashes in frame windows. 24,957, Woodward & Collier, Settling, Cutting, off, Scratching, and Finishing-off Sanitary Pipes, &c., when a Plastic or Semi-dry State. 24,958, Hanchett & Sage, Electrical Resistance Measuring Instruments. 24,973, A. Hackway, Safety Hand and Tool Tipping Reels. 24,973, Grindstones. 24,994, W. Mallett and Others, Optical Appliances Applicable as View-finders or for other Purposes. 25,000, C. G. Gsell, Purifying Water, For











**MANFIELD.**—For the erection of conditioning stores. St. John's place, Mansfield, for Mr. R. L. Jones, Messrs. Vallance & Westwick, architects, Mansfield.—  
 C. Vallance ..... £8 0 0  
 S. B. Frisby ..... 58 9 6  
 J. Greenwood ..... 640 0 0  
 C. G. Percival, Mansfield (accepted) ..... 537 2 0  
 F. H. & J. W. Moore 632 5 1

**MANFIELD.**—For proposed house, West Hill-drive, and shop, Chamber-street, Mansfield, for Messrs. Wright Bros. Messrs. Vallance & Westwick, architects, Mansfield.—  
 Gilbert & Gabbittas ..... £1,175  
 S. B. Frisby ..... 1,197  
 Brulford & Son ..... 1,177  
 J. Greenwood, Mansfield (accepted) ..... 1,166

**MANFIELD.**—For proposed two houses, The Park Mansfield, for Mrs. W. J. Dean, from plans (quantity and specification) by Messrs. Vallance & Westwick, architects, Mansfield.—  
 J. H. Vickers, Ltd. .... £1,780  
 F. Price ..... 1,770  
 H. Vickers ..... 1,750  
 J. Greenwood ..... 1,691  
 W. S. Cuddy, Mansfield\* 1,640  
 \* Accepted.

**MARKET DRAYTON.**—For the erection of vacant wards at Market Drayton, Salop, for the Guardians. Mr. G. A. Craig, architect, Market Drayton.—  
 Wood & Son ..... £1,730 0 0  
 Carratt ..... 1,688 0 0  
 Matthews ..... 1,685 0 0  
 J. Harding ..... 1,675 0 0  
 Hughes, Market Drayton (accepted) ..... £15 5

**MARYPORT.**—Accepted for rebuilding the "Victoria Vaults and Royal Oak" Inn, for the Brewery Company, Limited. Mr. C. Eaglesfield, architect, Maryport.—  
 Building—W. Marshall ..... £570  
 Joinery—J. Kendall .....  
 Scaffolding—T. Mardie .....  
 Plastering—T. Kirk .....  
 Plumbing—E. Graham .....  
 Painting and Glazing—J. Gordon .....  
 [All of Maryport]

**MUNDESLAY (Norfolk).**—For proposed new Grand Hotel. Mr. H. J. Green, architect, 21, Gattle Meadow, Norwich.—  
 J. Bennett ..... £10,150 0 0  
 S. Smith ..... 10,716 0 0  
 J. Young & Son ..... 11,850 0 0  
 O. Richey ..... 10,506 0 0  
 W. Collins ..... 11,555 0 0  
 Keridge & Shaw ..... 9,909 0 0  
 North Walsham\* ..... 9,600 3  
 \* Accepted.

**ORPINGTON.**—Accepted for the execution of decorative repairs to private residence at Orpington. Mr. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington.—  
 Somersford & Son ..... £142 10

**ORPINGTON.**—For the execution of repairs to premises situated in Wellington-road, Orpington. Mr. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington.—  
 Brookes & Pannett ..... £1,060 0 0  
 E. R. Thorpe ..... 120 15 1  
 J. Lonsdale ..... 112 10

**RUABON.**—For the erection of a house, Rhodlanerchrugog, for the School Board. Messrs. J. Morrison & Son, architects, Aung-street, Wrexham.—  
 John Davies ..... £460  
 Jenkins & Jones, Johnstown, Ruabon (accepted) £435  
 House only; no outbuildings.

**SALFORD.**—For new school in Grecian-street, for the Salford School Board. Mr. H. E. Steffen, architect, 10, Moley-street, Manchester. Quantities by the architect.—  
 C. H. Norman ..... £11,938  
 F. & E. Haynes ..... 11,604  
 Peters & Sons ..... 11,561  
 J. Byrom ..... 11,616  
 J. Ramsbottom ..... 11,424  
 W. Southern & Sons ..... 11,400  
 C. Macfarlane ..... 11,400  
 Wilson & Toff ..... 11,368  
 R. Neill & Son ..... 11,328  
 Chester (accepted) ..... 10,921  
 \* Accepted.

## C. B. N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT,  
 Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 29, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY TRUCKWAY, DRY, and FIT FOR IMMEDIATE USE.  
 Telephone, No. 274 Holborn. Tele. Address "SNEWIN," London

**SHOREHAM.**—For the erection of a private residence and stables at Shoreham, Kent. Mr. St. Pierre Harris, architect and surveyor, 8, Ironmonger-lane, E.C., and Orpington, Kent.—  
 Hanscomb & Smith ..... £2 10 0  
 J. Lonsdale ..... 1,186  
 Winstone & Son ..... £2,051

**SUNBURY-ON-THAMES.**—For the erection of a semi-detached villa at Sunbury-on-Thames, for Colonel Morgan, Park-road, Sunbury-on-Thames. Mr. Henry Hall, architect, 19, Doughty-street, Mecklenburg-square, W.C.—  
 Robinson & Francis, Ashford, Middlesex ..... £1,185 18

**SUTTON-IN-ASHFIELD.**—For proposed alterations and additions to the New Cross Hotel, Sutton-in-Ashfield, for Messrs. J. Hole & Co., Newark-on-Trent. Plans, quantities, and specification prepared by Messrs. Vallance & Westwick, architects, Mansfield.—  
 C. F. Taylor ..... £1,156  
 J. H. Vickers, Ltd. .... 847  
 Fuller Bros. .... 837  
 J. F. Price ..... 800  
 Gilbert & Gabbittas ..... £795  
 S. B. Frisby ..... 780  
 J. Keeling, Sutton-in-Ashfield (accepted) ..... 695

**WIDNES.**—Accepted for the extension of the West Bank Promenade. Mr. J. S. Sinclair, C.E., Town Hall, Widnes.—  
 John Taylor, 3, Long-lane, Garston, Liverpool ..... £3,500

**WINCHESTER.**—For erecting a house at Winchester, for Col. Dickens. Messrs. Cancellor & Hill, architects, 12, Jewry-street, Winchester.—  
 Carter & Sons ..... £2,248  
 Thompson ..... 2,246  
 Fidler ..... 2,178  
 Waters ..... £2,137  
 Jobbins ..... 2,000

**WOODFORD.**—Accepted for the erection of a pair of villas at South Woodford, Essex. Mr. Helmer Riches, architect, 2, Crooked-lane, King William-street, London, E.C.—  
 T. Osborn & Sons ..... £1,050

### TO CORRESPONDENTS.

A. and W. R. and W. C. C. D.—(Amounts should have been stated.)  
 We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.  
 We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## J. J. ETRIDGE, JR.

SLATE MERCHANT,  
 SLATER and TILER.

ESTIMATES GIVEN FOR  
 SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,  
 Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to

BETHNAL GREEN SLATE WORKS,  
 BETHNAL GREEN, LONDON, E.

### TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the office to residents in any part of the United Kingdom, at the rate of 12s. per annum (5s. 6d. per half-year). To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 20s. per annum. Remittances (payable to DOUGLAS FOURDRENIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by preparing at the Publishing Office, 20s. per annum (5s. 6d. per half-year) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## THE BATH STONE FIRMS, Ltd.

BATH  
 FOR ALL THE PROVED KINDS OF  
 BATH STONE.  
 FLUATE, for Hardening, Waterproofing,  
 and Preserving Building Materials.

## HAM HILL STONE.

DOULTING STONE.  
 The Ham Hill and Douling Stone Co.  
 (Incorporating The Ham Hill Stone Co. and C. Trask & Co.)  
 The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-Ham, Somerset.  
 London Agent:—Mr. E. A. Williams,  
 16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

## SPRAGUE & CO., Ltd.,

PHOTOLITHOGRAPHERS,  
 4 and 5, East Harding-street,  
 Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED  
 accurately and with despatch.

**METCHIM & SON** (OF GEORGE STREET),  
 "QUANTITY SURVEYORS' DIARY AND TABLES,"  
 For 1899, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C.  
 SUPPLY THE BEST MATERIAL AND  
 WORKMANSHIP FOR BUILDINGS,  
 DAMP COURSES, AREAS, ROOFS,  
 WASHHOUSE AND DAIRY FLOORS,  
 &c., &c.

This Asphalte was chosen to be  
 laid at Sandringham, on the new  
 General Post Office, and other  
 important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

# COPPER AND ZINC ROOFING. F. BRABY & CO.

LONDON, LIVERPOOL, GLASGOW, BRISTOL.  
 352 to 364, Enston-rd., N.W. 6 & 8, Hatton Garden. 47 & 49, St. Enoch-square. Ashton Gate Works, Coronation-rd.

VIEILLE MONTAGNE SOLE MANUFACTURING AGENTS.  
 NO SOLDER. NO EXTERNAL FASTENINGS.

Particulars on Application. Chief Offices: Fitteroy Works, EUSTON ROAD, LONDON, N.W.



# The Builder.

VOL. LXXV. No. 2915

DECEMBER 17, 1896.

## ILLUSTRATIONS.

The Ponte Vecchio, Florence.—Drawn by Mr. J. Staines Babb.	Double-Page Ink-Photo.
Dining-Room at the Palace, Darmstadt, for H.R.H. the Grand Duke of Hesse.—Mr. M. H. Bailie Scott, Architect.	Double-Page Ink-Photo.
Study for West End of a Town Church.—Mr. Sidney K. Greenslade, A.R.I.B.A., Architect.	Single-Page Ink-Photo.
A Street Front, for Exeter.—Mr. Sidney K. Greenslade, A.R.I.B.A., Architect.	Single-Page Ink-Photo.
St. George's Schools, Hanover-square.—Mr. Philip A. Robson, A.R.I.B.A., Architect.	Single-Page Photo-Litho.
Throat and Ear Hospital, Brighton.—Messrs. Scott & Cawthorn, Architects.	Single-Page Photo-Litho.

## Block in Text.

The Schools of St. George, Hanover-square, W. Plan.	Page 288
---	----------

## CONTENTS.

"Wat" Supply from the Chalk.	545	St. George's, Hanover-square, Higher Grade Schools.	558	The Student's Column.—Sound, Light, and Heat.—XXIV.	564
Rates.	547	Brighton, Hove, and Sussex Throat and Ear Hospital.	558	Obituary.	565
Royal Academy Students' Designs.	548	The Surveyors' Institution.	559	General Building News.	565
Royal Institute of British Architects.	549	Architectural Societies.	561	Sanitary and Engineering News.	566
The Architectural Association.	552	Competitions.	561	Stained Glass and Decoration.	566
The Institution of Civil Engineers.	557	The London County Council.	562	Foreign.	567
Archæological Societies.	561	Applications under the 1894 London Building Act.	564	Miscellaneous.	567
The Ponte Vecchio, Florence.	563	London Building Act, 1894.	564	Capital and Labour.	567
Dining-Room at the Palace, Darmstadt.	565	New Gymnasium and Workshops, Borough Polytechnic.	563	Legal.	567
West End of a Town Church.	565	The Architect's Use of Books.	563	Meetings.	568
A Street Front.	565	Books Received.	564	Recent Patents.	568

### Water Supply from the Chalk.



GREAT deal has been said during the last few weeks concerning the London County Council's scheme to fetch water for the metropolis from Wales, and the inhabitants of

that portion of the Principality chiefly affected by the scheme have become seriously alarmed, and will undoubtedly offer the most strenuous resistance to the annexation of even a single acre of their "water rights." The Monmouthshire County Council is extremely sore at the proposal to tap the upper sources of the Wye, and all the large centres of population in South Wales are in a state of unrest. Cardiff has secured an abundant supply from the Taff Vawr reservoirs, in Breconshire, and is extending the works. Swansea has gone to the same county and has tapped an important water area in close proximity to that portion of the Usk watershed coveted by the metropolis. Birmingham's already acquired site, drained by the river Elan, and one or two other rivers, is closely hemmed in by the London County Council's scheme. All these cities will have much to say, no doubt, to any attempt at preventing them from ever extending their water areas as occasion may require. The Carmarthen County Council will centre its opposition in the proposed appropriation of the upper waters of the Towy. So that, if the London scheme is really carried into effect, the attendant legal and Parliamentary expenses will not be the least item of cost. Everybody knows what a trouble Birmingham had to secure its foothold in Central Wales, and that even when a modest seventy square miles only were to be laid under contribution, instead of 488 square miles for which London is now seeking. Of course, there will always be opposition from public bodies in such cases—there always has been. And it may be argued that, inasmuch as certain cities have succeeded in spite of the opposition, London will probably succeed also. We hope that may be so, if the London scheme is to be proceeded with; but the case is stronger against the metropolis than was against Birmingham, from a Welsh

standpoint. Birmingham's area is well to the north of the populous centres of South Wales, and there was plenty of good gathering ground between that area and the populous centres referred to. We allude to the gathering grounds of the Towy and Yrion and the upper part of the Usk valley; but these are the very sites proposed to be captured by the metropolis, and which are estimated to yield 317 million gallons daily, or more than three-fourths of the quantity proposed to be dealt with by the London County Council in Wales. The opposition of Welsh authorities has, therefore, much more backbone in it than it has ever yet had. Of course, they cannot see the only convenient water-areas for them stolen under their very eyes, without raising the strongest opposition possible.

Under these circumstances, may we ask if it is yet too late to make further inquiry into the capability of other sources of supply nearer home? Have we yet found out, for instance, all that is possible concerning the capability of the chalk as a source of supply? A great deal has been written from time to time on the subject, and the aggregate literature would make a small library. But what does it all amount to from a practical standpoint? That may be fairly well gauged by the nature of the evidence given at different Royal Commissions. Summarised, that may be stated as consisting of a series of disjointed observations, of very unequal value, approximately complete for certain very restricted spots, but sadly incomplete as a whole. Commissioners must have always felt that the evidence put before them on this matter has not been such as to enable them to arrive at any definite conclusions, except in a very general way. It is a subject demanding the closest attention, and is not to be worked out by a single individual. Neither must it be approached in a partisan spirit, as has been so frequently the case in the past. It must not be left to well-meaning old gentlemen perambulating the country, as a sort of hobby; nor to spasmodic inquiries, of the fireworks order, carried out in connexion with the promotion of, or opposition to, any Bill in the House; nor to men who get their living as "expert witnesses," and who may have too many irons in the fire and too many interests to consult. The work can only be carried out

by a properly organised survey, and under Government control, and such a survey would be worth more than a dozen Royal Commissions, and much cheaper. We say "Government control" because any municipal body, such as the London County Council, is not sufficiently independent to do the work, and, in the case under review, the Council has already committed itself to a policy practically inimical to obtaining anything like an universal supply from the chalk, though it would possibly not admit that.

In short, we want more information on the matter before we can appraise the true value of the chalk as a water-bearing formation; and we can see no better way of obtaining that information than by having it collected by a Government survey, empowered to enter on private lands to make research, to take water levels in wells, and gauge the flow of streams and rivers, and, in connexion with the geological survey, to state the sources of the waters, so far as that can be ascertained. This new water survey should have competent chemists and bacteriologists attached to the staff, as well as geologists and engineers, and its work should extend over the whole of the United Kingdom, special attention being at first paid to urgent cases, such as the London water supply problem. The sooner this Survey is established, the better. We have had enough of municipal political bantering, in which every Councillor regards himself as a Heaven-born authority on water-supply matters, and where the faddist reigns supreme. We are not now talking of the control of the supply, which is a totally different matter, and may be left severely alone on the present occasion.

If any one doubts the advisability of having this matter sifted by Government instrumentality, let him do as the writer of this article has done. Let him endeavour in a private capacity to obtain entrance to private grounds in which wells are situated, by writing beforehand for permission, or by bearing proper introductions (and these partly of an official, though not of a compulsory, character); let him approach Bumbleton for public matters concerning the town's water supply; let him possess the most suave manner possible, the patience of Job, and one of the sweetest tempers in the world; and, if he is not then converted, he will be

obstinate indeed. He will find that in the majority of cases permission to visit and examine is most freely given, and he may, perhaps, be directly assisted in his work; even Bumble will receive him with open arms until Bumble is asked to do even the smallest amount of work for nothing. Give plenty of time to the work, and peg away at bad correspondents. Then plot your results on a large-scale map, and you will find that you have only got a small amount of evidence together; that over many square miles you have no information whatever and cannot get any.

Now, this missing evidence would not matter very much with any ordinary porous formation, but the chalk is not an ordinary formation, and has to be specially considered. On most hydrogeological maps it is marked as being "porous," but as a matter of fact it is not so. If any doubt be entertained on this head (after so many unqualified assertions to the contrary) let the reader take a block of chalk, cut it out in the shape of a basin or bucket, and fill the receptacle with water. After waiting for some considerable time it will be found that here and there a little globule of water will have formed on the outside. When the chalk sides have become saturated, however, these globules will form very much more slowly, and the bucket may be left for days without the water entirely disappearing, and then some of it must go by evaporation. Of course, some kinds of chalk are rather more open than others, and no rock (not even stiff clay) is actually impervious. At the same time, if those who sink wells in the chalk had to rely on what water has actually penetrated the body of that substance it would be an exceedingly bad outlook for them. It is safer, and much nearer the truth, to regard the chalk itself as impervious, from a practical standpoint, and to allow its water-giving capabilities to consist of the open joints running through it. Now, just a word or two about these joints and their distribution, for they are the controlling factors in the case.

To begin with, they are not so capriciously distributed as some would have us believe. There is a kind of method, rough and ready, we admit, but still a kind of method. These joints have been formed in several ways, of which the principal are the following:—The bulk of them, particularly the master joints, have been formed by the contraction of the material in bulk as it became formed under the sea, and on elevation afterwards. The chalk is, in maximum, about 800 ft. in thickness; under and near London (depending largely on denudation), however, it may not be more than 500 ft. to 600 ft. The whole of this was laid down in the sea during Cretaceous times, and some of the contraction alluded to was brought about, in the lower parts of the formation, by the weight of the superincumbent portion of the same formation. Nevertheless, the contraction which made most of these joints and cracks was that induced by these marine beds as they were brought above sea-level by bradyseismical elevation. A few more were, no doubt, made by violent earth movements in later times. Chemical change from within, whereby much of the carbonate of lime (of which the bulk of chalk is chemically composed) has been removed, and a species of marl left behind, has modified the "porosity," filled up some

of the minor cracks, and led to the establishment of others.

Thus a complete network of small joints and cracks has been produced. If these joints were always large, and if they always communicated with each other, all would be well, and we should not have need of so much purely local information concerning them—for water supply from the chalk largely consists of that. But the joints do not fulfil either of these conditions. Moreover, a great element of uncertainty has been introduced by the local enlargement of joints underground until the fissures thus made are veritable caves, some of them several feet in height and a mile or two in length. These can only be regarded as underground reservoirs, and the fortunate district possessing them has something to boast of from a water-supply standpoint. Billions of gallons are there, fed by the tricklings down through the smaller joints and cracks from the surface. If we could only locate several of these water-filled "caverns," and be able to note rise and fall of the surface of water in them, the chalk water-supply question would be largely solved. Failing that, we can only observe the rise and fall of the levels in wells, and that, though a bad substitute, is useful enough if the work could be carried out on a systematic plan.

We cannot, however, speak of the chalk as a homogeneous formation. It consists of at least three fairly distinct lithological parts. The upper is a soft limestone, marly in places, permeated by fissures in all directions, not necessarily communicating with each other except on a small scale and locally. The middle portion of the chalk is, locally, a hard rock, containing but few fissures and is a bad water producer. The lower portion is rather better, but still nothing like as good as the upper; it contains fewer fissures, joints, or cracks, and these are chiefly of a "blind" character. Indeed, the lower chalk is often alluded to as though it (and its joints) were entirely impervious, and as though the hydraulic properties of the upper chalk were due to the non-porosity of the lower chalk. That is right enough, locally, but cannot possibly hold good over wide areas. For, as any one who has followed the water-supply question knows, a great deal of the water in the Upper Greensand comes through fissures through the lower chalk. However, we cannot regard the lower chalk as such good water-bearing strata as the upper chalk, and those who have calculated the amount of water in the chalk formation as a whole, as though it were homogeneous from a water-supply standpoint, must be grievously in error. The usual method with many people has been to take the chalk *en bloc*, calculate its cubic contents, and then, after making certain allowances (mostly born and bred in their own minds), to say that the chalk contains so much water. So long as nothing serious was intended, this did not matter, but we cannot put up with such rubbish in dealing scientifically with the question. Nearly one-half of the chalk formation consists of this lower chalk, with few fissures, and not conspicuously water-bearing, except as a rarity. If the chalk be taken as, say, 650 ft. thick, then the lower part, about 300 ft. of this, cannot contain much water as a rule. The official geological map, made to show the distribution of fossils more particularly, is not much of an aid to us in distinguishing the fissured

from the practically non-fissured part of the formation—it does not pretend to be hydrogeological. Any one who takes such a map, ascertains that the chalk has an outcrop of so many square miles, and by a mathematical process endeavours to find out how much water the chalk holds (as very many "experts" have done), must be extremely wide of the mark.

However, the chalk, at any rate the upper part of the formation, is a good water-bearer, as we shall see. For practical purposes the chalk may be divided into separate geographical areas, the idea being to allow these areas to coincide with underground drainage areas of the formation. There is considerable difficulty in doing that, and it has not been seriously attempted. It is obvious, however, that until that can be satisfactorily done, nobody is able to give more than the barest approximation of the value of the formation for water-supply purposes. In general, it may be noted that one great area is in Hertfordshire and is already drawn upon to a very considerable extent, and indications are not wanting that, although the water capabilities there are by no means exhausted, they are suffering. In short, the chalk in that district is already captured, and the supply is already being delivered to the metropolis. The next large area to which we may draw attention is the western half of Essex and adjacent part of Middlesex. The chalk is there covered over by Tertiary deposits, but is easily reached by well-boring. The underground drainage is towards the south, and the supply of water extremely abundant; much of this to-day runs to waste, but several wells for the public supply already draw upon it, and others are in course of construction. No reliable data are available as to the actual quantity, experts differing considerably on the point. But all are agreed that in this part of Essex there is a very large body of good water underground in the chalk, which is very little drawn upon. A third area is underneath the metropolis itself, but this already supplies hundreds of private wells and may be disregarded from a public-supply standpoint. As an instance that the water-yielding capacity of the chalk has almost reached its limits, some writers have quoted the circumstance that the water level in that formation under London is much lower than it was fifty years ago. They rightly charge this decrease in level to the consumption by private wells. It should be remembered, however, that that exhaustion applies only to a very restricted area of a few square miles, and does not in any way refer to the great mass of chalk some hundreds of square miles in area to the west of the metropolis, and which is, to this day, super-charged with water. A fourth district, somewhat difficult to define on account of almost total want of knowledge concerning the drainage underground, is in West Herts and South Bucks. It is certain that in this area there is a great quantity of water available for public purposes, for it is only drawn upon to a very limited extent. A fifth district adjoins the fourth and is in South Berks. This has long been regarded as a probable source of metropolitan water supply, and is a rich one, but already drawn upon by several public bodies, in a small way. A sixth is continuous with the fifth, in North-eastern Wilts, and is, practically, virgin ground full of water. A



seventh may be defined as "underground chalk," covered by Tertiary deposits on the borders of Berks and Hants. An eighth is a narrow outcrop having a maximum breadth of 8 miles or thereabouts, stretching eastwards from Guildford to the neighbourhood of Croydon. This is an excellent water district, but is practically captured, Croydon, Sutton, Epsom, and other growing and populous towns, deriving their supply entirely from it. At the same time there is plenty to spare in the southern part of this prolific area. A ninth district is to the east of Croydon and on to North Kent. The upper chalk is here full of water, especially in that portion covered by the Tertiary deposits in North-east Kent. It is from this area that the unimpeachable quality water of the Kent Company is derived, and, in spite of the enormous extraction, there appears to be little or no diminution in the water level—on the broad scale, at least. What may be called the tenth district is in Mid-Kent. The water-bearing capacity of the chalk there has never been seriously tested, and we are without much authentic information. Since the last Royal Commission, when the late Mr. Topley called attention to it, and suggested with others that it might be laid under contribution for the metropolis, the area has been more or less explored, but practically nothing has been published. All that is known about it is that there is plenty of water in the rock, and the bulk of it seems to be running to waste under the sea, just off North Kent. This area will have to be carefully considered, but the engineering difficulties in capturing any very large body of the water will not be slight. The eleventh district of our classification is in East Kent, where recent examination has proved that a very large quantity of the water of the chalk is running into the sea from the cliffs to the north of Dover, and elsewhere.

Now, in calculating the actual amount of water available, it is unnecessary to consider existing water rights, which are of a political and not of a scientific character. But it is very essential that certain local areas should be fenced off as ground occupied by towns, under which the water may be assumed to be contaminated, or at least to be of a suspicious nature.

In future articles, from time to time, we propose to study each of these districts separately, when these points will be discussed in detail.

#### NOTES.

WE are glad to see that Sir John Gorst has been emphasising the necessity of a good elementary education as the foundation of a system of technical education. In a speech this week he gave some instances of the way in which an insufficient elementary education hinders the progress of technical education. The example was that certain students in chemistry, though they showed considerable general intelligence and much interest in the work, were hampered in it by their insufficient knowledge of arithmetic, so that they could not work out various results. This shows, in the plainest way, that the importance of elementary education is often overlooked in the discussions which continue to go on in regard to technical education. Any one who is acquainted with the state of education in

Germany must appreciate even more every day that it is the sound general education of boys and youths which is at the foundation of German knowledge. To try to ingraft a system of technical or commercial education on a poor system of elementary education is very much the same thing as trying to place the walls of a building which are above ground on weak foundations. The one thing is about as foolish as the other.

The L.C.C.  
Works  
Department.

THE Works Department of the London County Council appears still to be in difficulties, though not to the extent some of its critics are suggesting; in fact, since the new management there has been great improvement in the working of the department, and the various losses which have to be reported were principally made under the old management. According to the report submitted to the Council on Tuesday by the Finance Committee, the total amount of cost above the fixed estimates prior to the new management was 50,239*l.*, but a saving of 9,373*l.* has been effected since, and, consequently, the total amount of cost above the fixed estimate, up to September of this year, has been 40,866*l.* The most serious loss has been incurred in the construction of the Lewisham sewer, the cost of which has exceeded the estimate by 22,924*l.*; 19,722*l.* of this loss was incurred previous to February, 1897, when the new manager was appointed, and the excess of 3,202*l.* since then is attributed to the period of the reorganisation of the work and rearrangement of the staff, while the remainder is practically accounted for by the extraordinary charges for establishment during the year 1897-98, which, owing to the small amount of work entrusted to the department, rose from 8 per cent. to 16½ per cent., or an addition to the cost of 1,991*l.* When the report is discussed by the Council no doubt the improvement which has taken place in the department will be made much of; but the fact remains that a total loss of over 40,000*l.* has so far been incurred.

The Institute  
Dinner.

THE annual dinner of the Institute of Architects, held this year at Birmingham, of which a detailed account will be found on another page, may be said to have been in every way successful, and justifies the policy of the Institute in occasionally holding these dinners at a provincial centre, as a means of drawing together the architects of London and the provinces, and emphasising the fact that the Institute is a national and not a merely metropolitan body. Of course, on such an occasion it is natural that the provincial and local members should predominate numerically, as comparatively few of the London members in large practice can find time to attend a dinner at some distance from London; but this fact is quite in keeping with the object of having the dinner occasionally in the provinces. While every one regretted the unavoidable absence of the President through illness, Mr. Florence, the senior Vice-President, may be congratulated on the admirable manner in which he occupied the chair and contributed very much to the success of the occasion; and Mr. Bidlake's old friends in London may compliment him on the evident popularity he has achieved in Birmingham, as evidenced by the warm reception he met with when

called upon to respond to the toast of "Architecture and the Kindred Arts." Mr. J. T. Middlemore, a wealthy inhabitant of Birmingham who takes a great deal of interest in art, made a speech of considerable interest and which rose above the ordinary level of after-dinner speeches. The surroundings of the dinner we may observe, were better than they have generally been in London; few hotels can boast such a lofty, cheerful, and palatial-looking room for public dinners as that which has been attached to the Grand Hotel at Birmingham.

Professor  
Hayter Lewis.

By the death of Professor Hayter Lewis the architectural world loses one who was a typical example of the old school of learned architects, who were as much scholars and students of architecture as architects. Professor Lewis carried out comparatively few buildings, but he had a remarkable knowledge of architectural style and history, and combined with this a high degree of general literary culture. He was a man of exceptional refinement of mind and of the greatest kindness and amiability of disposition; and the phrase, sometimes rather conventionally used, that he was beloved by all who knew him, is in regard to him no more than the simple truth.

Municipal  
Officers  
and Companies.

THE unsuccessful action brought against London by Sir J. Savory, at one time Lord Mayor of London, will, we hope, be a lesson to all those who try to play the double part of working in municipal offices and also taking an active in companies with which the Municipality has to do business. One does not, of course, impute anything in the nature of dishonesty to Sir J. Savory, but it is perfectly clear that a man cannot be at once the agent, so to say, of a Corporation and of a Company which has to make terms with this Corporation, whether it be for electric lighting or any other purpose. A mayor or an alderman or a member of a municipal committee is the agent of the general body of rate-payers, just as a director is the agent of the general body of shareholders. No man can serve two masters properly. Therefore the most severe criticism may be justly turned on the man who wishes to gain reputation by serving his fellow citizens, and to replenish his pocket by serving on the board of a Company which has dealings with the Corporation. We have purposely not gone into any of the facts of the recent trial, because it is the principle which it emphasises which is what we desire that our readers should note.

Railway Pass-  
enger Com-  
munication.

THE paper read last week by Mr. W. E. Langdon, the able electrician of the Midland Railway Company, to the Institution of Electrical Engineers, is interesting, as it follows so soon after the report of the Committee appointed by the Board of Trade to consider the best method of intercommunication in railway trains. It will be remembered that in their report the Committee condemned utterly the outside cord system, praised in general terms electric systems, and advised that the law should be extended so as to require an efficient means of intercommunication on all trains. They also stated that the electric communication should not entail the use of

additional couplings to those already existing. Now all the couplings except the brake coupling are unsuitable for the electric wires, and Mr. Langdon thinks that to use this coupling to carry the wires would be unwise, as it would lead to a divided responsibility between those who maintain the brakes and the electricians. The method devised by Mr. Langdon for the Midland Railway Company is excellent. There are four points in each carriage above the quarter lights where communication can be made. On pulling down any one of these, a disc on the outside of the carriage is shown and the bells in the guards'-vans and engine set ringing. It is very simple mechanically and electrically; one coupling only for the two wires forming the circuit is used, and judging from the specimen shown, it could hardly be simpler or more efficient. Its application to existing carriages would be easy, and its first cost and subsequent maintenance cheap. It is the most complete electric system yet proposed, and has the great advantage that the rolling stock of the different companies which adopt it could be coupled together without rearranging the electrical connexions.

A MEMBERS' and students' conversation was held at the Northampton Institute on the evening of the 9th inst. A feature of the evening was the delivery of what are called "lectures." That by Dr. R. M. Walmsley on "Wireless Telegraphy" was interesting, and was much appreciated by a large audience. The exhibits in the various class-rooms were well displayed, but owing to somewhat inefficient demonstration were not very highly appreciated. The engineering drawing-office is well illuminated by arc lamps, whose reflected rays from the ceiling give an ideal light, without shadows, to draw by. The architectural exhibits were meagre, and with the exception of one or two large photographs were of little account. The exhibits in the building trades' shops were poor, and this branch of the Institute does not seem to be too well patronised, though the engineering department appears successful. A feature was made of the artistic crafts, and these, though in their infancy, show some promise. An effort was made to enlist public interest by the modelling of a man's head in clay during the evening; but the model was obviously uncomfortable. The most trying feature of the evening was the unhealthy state of the atmosphere. We noticed this on a previous occasion; and it is quite time that the authorities took the matter in hand and instituted an efficient scheme of ventilation.

It is announced that the authorities have resolved to pull down, and to re-build, the old Post Office, on the east side of St. Martin's-le-Grand. That structure, designed by Sir R. Smirke, R.A., was built in 1825-9; it has since been altered by the closing of its fine central hall, 80 ft. by about 60 ft., divided by Ionic columns into three aisles, and the addition of an attic story. It occupies the site (in part) of the collegiate church of St. Martin, and of 130 houses, standing in several courts and alleys, which had formed the old precincts of the Liberty and Sanctuary. The College is said to have been founded by Wihgred, who was King of

Kentin 694-725, and endowed in or about 1056 by Girard and his brother Ingelric, Earl of Essex. On clearing the ground for Smirke's building was destroyed the crypt of the church, as rebuilt by William of Wykeham, who was Dean of the College, and a great amount of Roman remains were discovered. The church tower and spire are drawn in A. Van Wyngaerde's view of London, circa 1550, now in the collection given by Mrs. Sutherland to the Bodleian Library. The parish of St. Leonard Foster is almost co-terminous with the boundaries of the college and its precincts. In the Crace collection are views, by Girtin and Schnebbelie, of the crypt and the old houses.

THE "Vieux Paris" Committee has undertaken to start some excavations in the garden of the archbishop's palace, with a view of finding some remains of the wall of the ancient central portion of Paris, still called the "Cité," and it is hoped by this means to make out the entire configuration of the walls of the ancient Lutetia.

At their meeting on November 17 last the Court of Common Council approved plans for making Lothbury 50 ft. wide on the south side, between Old Jewry and Prince's-street, at a cost of 42,000*l.*, the London County Council contributing 15,000*l.*; and for making a new street (Lloyd's-avenue) from Fenchurch-street to Crutched Friars. The widening of Lothbury will involve the removal of the corner of Bank-buildings. No. 5 has just been vacated by Messrs. Freshfield & Williams; No. 7 is at present occupied by the London and Provincial Bank; the scheme will destroy the homogeneity of Soane's design. Soane built Bank-buildings in Prince's-street in 1807-10, widening and straightening Prince's-street, which formerly turned eastwards and then northwards to opposite St. Margaret's Church, taking the recovered ground for his enlargement of the Bank of England. At that time (old) Bank-buildings were standing on the triangular space in front of the Royal Exchange. The Grocers' Company resisted the extension of Prince's-street through their garden, and obtained 20,000*l.* in compensation. We have examined in the Soane Museum, by the Curator's courtesy, several volumes of drawings relating to Soane's work on the spot in question; one set of plans is signed by him and entitled "The Five Houses in Prince's-street, called 'New Bank buildings,' erected 1807-10 upon ground recently bought by the Bank of England." There are also some sets of varying designs for the premises he built (on the same ground) for the Reduction of the National Debt Office, now No. 19, Old Jewry, in 1817-8. A distinctive feature of that office's interior is the large open space, on the ground floor, lighted by a drum and cupola standing upon four arches, which Soane describes as the "cenotaph and place for paying English and Irish tontines," and especially designed for Westmacott's seated statue of William Pitt, presented by the Bank directors to the National Debt Commissioners. A wooden model of the "cenotaph" is in his Museum. The plans of the original property are interesting; they show the sites of the Grocers' (old) Hall and garden, and the old Meeting House,

Meeting House-court, and almshouses in Old Jewry. The almshouses, now quite forgotten, were founded with a bequest in 1551, by Dame Elizabeth Morys to the Armourers and Braziers Company of all her lands and tenements in St. Olave, Jewry, parish, under charitable trusts. Under an Act of 49 George III., the Governors and Company of the Bank of England bought from the Armourers for 10,000*l.* the Morys trust property—comprising the almshouses, then occupied by thirteen almspeople, three messuages, and the Meeting House, where are now No. 19, Old Jewry, and the open space in the rear of Bank-buildings. Meeting House-court was called in and before last century Windmill-court.

At the exhibition of the "Société Internationale" at the Georges Petit Gallery, Paris, the works of foreign painters predominate, and among those which have attracted most attention are the various works exhibited by Mr. Brangwyn, which appear to have impressed French visitors with a sense of their power of character and colour. M. Emile Claus exhibits a "Brouillard du Matin" which recalls the landscapes of Claude Monet; M. Baertsoen exhibits a good Dutch landscape. Three works by Mr. John Alexander, "La Rose," "Le Miroir," "L'Attente," are specially worth notice, also a beautiful moonlight view at Bellisle-en-Mer, by Mr. Humphreys Johnston. Among the French exhibitors, M. Lucien Simon exhibits a *genre* painting of Breton figures; M. Duhem some good water-colours, and MM. Felix Bouchon, G. J. Rousseau, and Rochegrosse, are prominent. Among the sculpture work are some remarkable sketches in plaster and a bust in bronze by M. Rodin.

#### ROYAL ACADEMY STUDENTS' DESIGNS.

It is naturally our duty, in looking at the collected students' designs at the Royal Academy, to go through first to the end rooms where the architectural drawings are hung; but the result certainly does not indicate that the architectural department of Royal Academy teaching is in a very flourishing state. For the Travelling Studentship, with a very promising subject, "A Town Church," only two designs are submitted, to one of which, that by Mr. William Hawke, the Studentship has been awarded. It is a quasi-Romanesque design, with some points of novelty in the detail, but wants coherence in style—the treatment of the buttresses and pinnacles round the dome, for instance, has no affinity with the details of the lower portion; and both in plan and design the domed portion of the church ought to be more decisively marked out and separately treated. As it is, one has the impression only of a nave of which one portion has a dome over it and the other has not. The other design submitted has more coherence of style and treatment, but is not interesting. The 25*l.* prize for "A Set of Architectural Designs" has attracted only one candidate, Mr. J. Stevens Lee, who earns the prize, we must say rather easily, for a set of sketchy drawings of the west end of a church with an apsidal baptistry—good in style, but hardly a set to win an important prize with. In fact, the architectural prizes seem to be going begging. The silver medal, for measured drawings of the Hall of the Middle Temple, has attracted no competitors at all. Among the Lower School designs some are suggestive and original though slight; the 10*l.* prize is awarded to Mr. A. E. Corbett for a design for a country railway station, which has the merit at any rate of indicating in the exterior treatment the position of the booking-office. Among the other Lower School designs that



for a boat-house, numbered 151, is effective and suitable, and that for a game-keeper's cottage, No. 147, has a good deal of character. The competition for the plan of a building (subject—"A Town Club House") has been gained by Mr. A. Campbell Martin; the plan, with a central entrance, is dignified in arrangement, but the writing-room should not have been next the street. The billiard-room on the upper floor would be very inadequately lighted without a top light, which may be intended but is not indicated. The design numbered 161 is in some respects better; the writing-room is at the back and well lighted; the side position of the entrance, however, is not so dignified for a first-class club as the central entrance, and the billiard-room does not appear, but may be intended to be on another floor than the two shown.

In the "Cartoon for a Draped Figure" competition (subject "Calliope") the prize goes to Mr. George Murray, for a fine and dignified figure, with which none of the others can be said to compete. In sculpture the principal competition is for a group (small scale) of Diana and Endymion, for which there are a good many competitors, and a higher general standard of merit than in any other class. The first prize is taken by Mr. Stanley Nicholson Babb, whose group has a fine decorative character, and indicates a study of French sculpture. In the second prize group, by Mr. A. Bertie Pegram, the figure of Endymion is propped half upright in an uncomfortable attitude, though the group composes well in line. The first prize group, we may observe, would be very well suited for execution in bronze or silver as a centre-piece, on its present scale. Mr. S. Nicholson Babb also has the prize for a "Bas-relief of figure and ornament," for which there are only two competitors; his design is an admirable piece of work. In the three models of figures from life the first prize is taken by Mr. Gilbert W. Bayes and the second by Mr. A. Bertie Pegram; the two are very equal in merit however; in both the nude figure of a man about to sheathe a sword is a very spirited and excellent piece of work.

The competition for a design for the decoration of a public building, one in which we always feel a special interest, is gained by Mr. George Murray. The subject is "Harvest." It is a composition in which figures pass from left to right across the picture; the colour is fine and rich, and the figures of the children and of the woman following them (the one selected for treatment as a full size cartoon) are very graceful and original. Perhaps the objection may be made that the line of the composition, partly owing to the introduction of the child group, is a little broken and irregular; in this respect the general design of No. 87\* is more truly decorative, but the detail and colour are not so good. Some of the students have entirely missed the proper character of decorative painting; Nos. 90 and 94, for instance, are pictures, but not mural decoration.

The first Armitage prize, for a design in monochrome for a figure picture, has not been awarded, and the general merit of the designs is not equal to what we have seen in some former years; the second prize has been awarded to Mr. F. Cadogan Cooper. The subject is "Joseph Preventing his Father before Pharaoh." The Creswick prize for landscape (subject—"A Bridge over a Trout Stream") is awarded to Mr. F. Mopleyard for a work which is quite the best of the set; the style is broad and there is a unity of effect in the picture; the weak points are the water and the bridge; and we may observe that in all of them the bridge is rather weakly treated; there is no feeling for the picturesque of stonework. No. 1 shows a broad effect of light; No. 4 is a pretty composition. In several of them we notice the usual defect, in youthful landscapes, of the rather crude and harsh tone of the greens in grass and foliage.

The silver medal for a perspective drawing in outline of a building (open to painters and sculptors only) has attracted no competitors. We do not see why sculptors should be invited to compete for this prize, unless it be in relation to the introduction of buildings in bas-reliefs; but students of painting, at all events, are wrong to neglect it. The faults of perspective in the treatment of buildings in pictures are so frequent as to show that more attention to this subject would be very desirable.

## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

CONFERENCE AND DINNER AT BIRMINGHAM.

A JOINT meeting of the Royal Institute of British Architects and the Birmingham Architectural Association was held on Friday last week, at the rooms of the Royal Society of Artists, Birmingham. In the absence of the President of the Institute (Professor Aitchison) through illness, Mr. W. M. Fawcett, one of the Vice-Presidents, took the chair. The subject for discussion was "Building By-laws and their Administration." Mr. C. E. Bateman explained that the subject had been selected by the local Association because the Birmingham City Council was about to frame new building by-laws, and had promised to submit the draft to the Association. They hoped to have the assistance of the Royal Institute in considering these by-laws, and also in an effort to obtain greater uniformity in the by-laws of Birmingham and the surrounding districts, from the want of which a great deal of difficulty and annoyance arose.

The following paper on the subject, by Mr. W. Henman, was then read by the Secretary of the Institute (Mr. W. J. Locke):—

Before entering upon the subject of "Building By-Laws and their Administration," respecting which I have been requested to make a few remarks preliminary to the discussion which it is hoped may follow, permit me to express my satisfaction that the Institute has determined to hold such gatherings as this from time to time at the centre of one or other of the allied societies and to offer on behalf of the Birmingham Architectural Association a hearty welcome to all who have come to take part in this meeting.

It seems to me most appropriate that at these business meetings held in the provinces, subjects which principally affect the daily work and status of architects practising outside the Metropolitan area should receive consideration. Time at disposal would be too short for full discussion of subjects connected with the higher branches of our art, and is in fact barely sufficient to given even a general idea of the difficulties surrounding a subject such as I have to bring to your notice; but it may, I trust, be enough to indicate the widespread feeling that building by-laws and their administration throughout the country are in a most unsatisfactory condition. Unless members of our profession can bring united pressure to bear upon the responsible authorities, the evils under which we have so long suffered may extend and cause in the future still greater annoyance and irritation to architects as well as injury and loss to the public.

It will be understood from the foregoing that the Metropolis is purposely excluded from present consideration, the reason being that the Building Act applying thereto has recently been revised, and because it is administered by an experienced body of men, who, I believe, are generally architects or have had an architectural training, in addition to which there is power of appeal to the London County Council. I pronounce no opinion, therefore, either upon the new Metropolitan Building Act nor upon its administration, but desire to draw attention to the fact that in the provinces an entirely different state of affairs exists.

Under the Public Health Act of 1875 District Authorities are empowered to make by-laws and building regulations subject to the approval of the Local Government Board. Some latitude in a few special particulars to meet local requirements may be necessary and advisable; but when every District Authority is allowed to make all sorts of petty variations confusion results, and architects who have works to carry out in several perched adjoining districts are often caused the greatest annoyance and inconvenience by having plans disapproved in one district which would be passed without question in another, and this frequently resulting from the interpretation different surveyors may put upon the same by-law or regulation. Some Local Authorities make regulations simply by resolution of the Board, which they do not even print or circulate, and endeavour to enforce observance thereof without having secured the approval of the Local Government Board.

It may, I hope, be taken for granted that architects as a body have not the slightest desire to evade or obstruct any by-law or even any regulation lawfully made with the object of securing safety and health, provided such

by-law or regulation is uniformly and reasonably enforced. Most of the difficulties, annoyances, and petty irritations principally arise because those in authority too often lose sight of the one and only object for which building by-laws and regulations are necessary, viz., to secure safety and health to individuals and communities.

The so-called model by-laws of the Local Government Board were framed with that object doubtless, but they are confused in arrangement; they go too much into detail on matters of minor importance, and respecting which knowledge is yet imperfect, and omit reference to matters of structural importance, the neglect of which in some buildings may be a definite source of danger. Moreover, they are wrapped up in a vast amount of unnecessary legal jargon and excessive verbiage. On these, really far from model, by-laws those of District Authorities are framed, but each with numerous variations even in neighbouring districts; reference to any particular subject is rarely assisted by suitable headings, marginal notes, or index. Special Acts of Parliament, promoted by Local Authorities for entirely different purposes, frequently have slipped into them clauses which either extend or repeal portions of building by-laws previously in force, and it rarely happens that such provisions are properly set forth in the printed matter issued as the building by-laws of the district. All this is bad enough, but difficulties are increased by the uncertain methods of administration.

Apart from the larger cities, provincial District Surveyors are usually selected from a class of men trained to road surveying and sewer laying, with little knowledge of building construction and less of architectural propriety. Brought up in the offices of District Surveyors, they appear to imbibe the idea that architects are their natural enemies, and that their duty consists in devising means for wasting their time and causing them unnecessary trouble, quite regardless whether by so doing the safety or health of an individual may be secured.

In populous districts the Surveyors are assisted by Building Inspectors with, as a rule, even less knowledge and discretion, so that instead of inspection and regulation, such as I take it the law intended, there is frequent dictation and undue interference.

One class of property for which well-devised building regulations are required—viz., dwellings for the working classes—are still erected in the most flimsy fashion by the jerry builder, who generally goes scot free, while architects who desire to build scientifically and well are continually harassed by unreasonable restrictions and requirements under cover of a questionable by-law. The reason for this is not far to seek. Too many members of District Councils are interested, directly or indirectly, in building operations; the Surveyor can serve such in many ways, and in turn obtains their support. Inspectors are but mortal, and generally underpaid; it is, therefore, not surprising that some of them come under the influence of the speculative builder. Little credit accrues to them by drawing attention to his irregularities, but *édat* is gained when an architect is reported as having convened even the letter of a by-law or regulation. Strange to say, the architect has no redress whatever, the Surveyor is all pretext, for even if the committee is permitted to be approached, they generally support the action of their Surveyor, and the Local Government Board proclaim their inability to interfere. Resistance to unreasonable demands simply engenders greater exactions, so that, more often than not, architects give way simply for the sake of peace and quietness.

Another side of the question, particularly in large towns and cities, seriously affects every class of the community. Year by year District Authorities are grasping at greater powers of control, ostensibly for the public good. Local Acts are slipped through Parliament. By-laws and regulations are made, many of which seriously trench on the rights of property and of individuals, or by which the cost of building is seriously and unnecessarily enhanced. In order to counteract these evils, members of our profession must act together and strive to obtain the co-operation of building proprietors by letting it be known through the public Press that action is being taken, in the hope of regulating local authorities and their officials within reasonable limits. Pressure must also be brought to bear upon the Local Government Board so that building by-laws

\* Only the names of the prize-winners are given by the Academy.



may in all essentials be uniform, and that only such regulations may be sanctioned as are proved to be necessary to secure health and safety. In addition to which courts of appeal, easily accessible, should be constituted.

Although but indirectly connected with our subject, I take this opportunity for drawing attention to the employment of district surveyors in carrying out buildings of architectural character, such as infectious hospitals, baths, libraries, markets, and even town halls and council houses. Rarely have they received suitable training to fit them for undertaking such works, and in doing so architects are deprived of legitimate employment for which many of them have spent years of study and gained practical experience. Why district surveyors should be so anxious to undertake the carrying out of work additional to their ordinary duties may at first sight appear unaccountable, but I have had opportunities for watching the process, and seen the results.

As previously mentioned, surveyors often make themselves useful to members of their board; then, when a building is required, they suggest that an architect's fees may be saved by employing their salaried servant. This appears so plausible to the average district councillor that it is not surprising the surveyor is entrusted with the work. He then obtains the services of some architectural hack, who prepares the design. The work proceeds; Mr. Surveyor then suggests that, in consequence of the labour involved, he should receive extra remuneration, which generally takes the form of a rise in his salary, and often the "temporary" hack becomes a permanent addition to his staff; so that the ratepayers, instead of simply having to pay an architect the usual 5 per cent. on the cost of the work, are saddled with an annual charge, which in the aggregate largely exceeds the legitimate fees for the carrying out of the work. In addition to which it is a well known fact that the actual outlay on surveys carried out under the control of surveyors generally is far in excess of what it would be in the hands of a qualified architect, so that, not only do members of our profession suffer, but the public have to bear the excessive cost, and the buildings lack architectural character and usefulness.

In some districts surveyors are permitted to undertake private work. They prepare designs in the public offices with the assistance of their staff; necessarily those designs are passed without question, and I have even heard of difficulties being thrown in the way of building proprietors and architects evidently for the purpose of diverting work into the hands of the surveyor.

These are crying evils, which it is to be hoped the Institute will take up and exert itself to remedy; it is one way in which it may demonstrate its power for the good of the profession and benefit the public. Such useful action is, in my opinion, the best means to adopt for the extension of its influence and the increase of its membership throughout the country.

Mr. Nicoll said that in his personal experience the surveyors were not so very bad to deal with. The architect, if he went about it the right way, generally got his own way in the end.

Mr. W. Milburn said that in Sunderland they had a set of unsuitable by-laws, framed by the Corporation, and the architects got up an agitation, in which they obtained the assistance not only of the builders but of the leaders of the workmen's societies. The result was that they got the by-laws amended.

Mr. J. Cotton condemned some of the by-laws enforced in country towns as tending to destroy the picturesque irregularity which was one of the charms of such places. He suggested that the local Association should call into consultation the architects from the surrounding districts. The late Birmingham Surveyor was one of the best men they could have had in such an office, and he had found no difficulty in the present surveyor's rulings when the matter was put to him in the right way. By-laws should vary to suit local conditions—as, for instance, those of stone districts—but in what was really one large town uniformity was desirable. For instance, they could do things in Handsworth which they were not allowed to do in Moseley.

Mr. P. Gordon Smith said that Birmingham having special powers under the Consolidation Act, the suburban districts could not exactly copy its by-laws. He thought, however, that

it would be a very great advantage if all the local authorities in the neighbourhood would meet in Birmingham and form a committee to go into the whole subject, with the view of framing a code of by-laws. They might, perhaps, get the assistance of some one from the Local Government Board to point out to them what they could or could not do. He was sure that the representatives of such a conference would receive the utmost consideration from the Local Government Board. As to the "regulations" of which complaint had been made, a District Council could make what regulations it liked, but it could not enforce them. There was no penalty. As for the model by-laws, the Local Government Board could not compel the adoption of any one of them. These by-laws had stood the test of the courts very well, but if their phraseology were obscure, there was no objection to the Local Authority printing explanations or illustrations with them. As for the surveyors, he had found them excellent officers and very amenable to reason. In many of the large towns the surveyors were simply splendid men.

The Chairman said that it appeared to him that the Birmingham architects should take a leaf from the book of their Sunderland colleagues.

Mr. A. E. Sawday, Leicester, thought they need not be thin-skinned on this question. It was taken up in Leicester, with the result that a resolution of the Council was passed that for all work over a certain amount an outside architect should be engaged.

On the motion of the Chairman, the following resolution was unanimously adopted:—"That the Institute is in sympathy with the action that is being taken by the Birmingham Architectural Association as to the framing and administration of by-laws in Birmingham and the surrounding district, and will be very pleased to assist the local society by advice or suggestion in their action."

During the afternoon several of the architects from London were shown over the new General Hospital, with the special object of inspecting the results of the mechanical ventilation system carried out by Mr. Key, under the supervision of Mr. Henman, the architect. The system has been fully described in our columns; we refer to it now to record our impression after a personal inspection. We had rather a prejudice against any system of ventilation with closed windows, but we must say that after going through the building and experiencing the result we think that, as far as the wards are concerned, it is a decided success. It should be observed here that the windows are not constructed so that they cannot be opened (a mistaken impression which was rather fostered by one of Mr. Henman's own papers on the subject); they can be opened if desired, but as a rule are not. The air is sucked in from windows in the basement (carefully selected so as to be out of the way of contaminated air) by a fan, passing first through a screen of strained jute fibre, kept automatically wetted every quarter of an hour; then between a series of upright steam-pipes, heated to the required temperature; then through the fan and into the basement tunnels (about 3 ft. wide and just high enough to stand upright in), of which there is an extent of about two miles in length. From there the vertical ducts lead to the rooms above. The heating capacity of the main congeries of steam-pipes can be diminished at once, if necessary from any sudden change of weather, by a system of hinged wooden covers which shut off a portion of them from the air. At the mouth of each of the vertical ducts before referred to is a separate steam radiator to give an extra warmth, which may be required for special rooms; the main congeries of radiators supplying the average heat, the separate radiators supplying the slight variations required for different departments. The successful obstruction of dirt from the incoming air was proved by the state of the outside of the jute screen, which blackened the hands at once; as a member of the party observed, "it was filtering all the solid good out of the Birmingham air." In the wards, and in all the other rooms, the air is admitted at the window boards, behind a vertical glass screen about 18 inches high, to screen off direct draught and direct the air upwards towards the ceiling; it is finally extracted near the floor, to ensure circulation. The purity of air in the surgical ward inspected was certainly remarkable; and the principal

nurse, who had been there for nearly a year, informed us that there was not the slightest uncomfortable result from the forced air system, and (what was more important) that she had never been in a ward in which any smell that arose was so quickly carried away; it seemed to be all gone in five minutes. That, of course, is the result which might be expected from having the movement of the air under absolute control. To a question as to whether the patients ever complained of draughts, it was replied that sometimes they complained of a draught when one of the window-blinds was half-down, and they saw it waving in the in-coming current; "but we pull up the blind so that they cannot see it, and then they do not feel a draught any more." All this is in regard to the system as applied to the hospital wards, which are rooms under special conditions, and are best ventilated in this manner. We should not apply the system to the administration rooms, nurses' home, &c., which are more in the nature of ordinary living rooms. In the board-room we were conscious of a shut-up feeling in comparison with living-rooms generally, and we should prefer the feeling created by frequently opened windows. But we do not expect a hospital ward to be like a living room, nor can windows be well opened there in winter, as the room is continuously occupied day and night. For the ventilation of the wards the system is admirable; and it will be equally suitable for concert-rooms and theatres, where a special supply for an unusual number of persons is required.

It should be noted that the ventilation is divided into eight separate systems worked by eight fans, but in case of the breakdown of a fan two systems can be coupled and worked by one fan.

The annual dinner of the Institute was held in the evening in the Grosvenor Room, Grand Hotel. The President (Professor Aitchison, R.A.) was prevented by indisposition from attending, and the chair was taken by Mr. H. L. Florence, Vice-President. The following gentlemen were present amongst others: The Lord Mayor of Birmingham (Alderman Beale), the Deputy Lord Mayor of Birmingham (Sir James Smith), Sir Benjamin Stone, M.P., Mr. J. Powell Williams, M.P., Mr. W. Kenrick, M.P., Mr. J. H. Cartland (High Sheriff of Warwickshire), Mr. J. Thackray Bunce, F.S.S., Principal Heath (Mason University College), Rev. E. F. M. McCarthy, Rev. A. R. Vardy, Dr. Saunby (President, Birmingham Medical Institute), Mr. Whitworth Wallis, Mr. J. T. Middlemore, Mr. C. E. Bateman (President, Birmingham Architectural Association), Mr. A. E. Sawday (President, Leicester Society of Architects), Mr. R. I. Bennett (President, Manchester Society of Architects), Mr. George Corson (President, Leeds and Yorks Architectural Society), Mr. David Barclay (President, Glasgow Institute of Architects), Mr. W. M. Fawcett, Mr. Ernest George, and Mr. E. A. Gruning (Vice-Presidents of the Institute), Mr. W. Emerson (hon. sec.), and Messrs. Aston Webb, W. H. Bidlake, T. E. Colcutt, W. Doubleday, John Ely, E. M. Gibbs, Wm. Henman, W. J. Locke (secretary), E. W. Mountford, P. Gordon Smith, H. Heathcote Satham, John Slater, H. D. Seales-Wood, and others.

The Chairman, having given the toast of H.M. the Queen, and afterwards that of H.R.H. the Prince of Wales and the Royal family.

Sir James Smith proposed "The Houses of Parliament," and in doing so said that every one, especially those who did not live in London, took a pride in the Houses of Parliament, and agreed that the buildings were such as the nation could be justly proud of. It was a curious coincidence that the best public building in Birmingham, viz., King Edward's Grammar School, in New-street, was also designed by Barry, the architect of the Parliament Houses. He was afraid Birmingham could not boast of many buildings of the same merit as this. Birmingham was rather a city of manufactures, and there was not much scope for architectural beauty in building factories, especially when all wanted their factories as large as possible for the smallest amount of money. In taking a stranger round Birmingham to show him the public buildings a start should be made at the Grammar School. Then, if the visitor could be got to keep his eyes shut until the Town Hall was reached, a good impression would be produced, for the Town



Hall, both inside and out, was a building of which Birmingham folk were not ashamed. Some of the modern buildings, such as Mason College, the Victoria Courts, and the new General Hospital, did the city credit. The City Corporation had recently had offered to them by Mr. J. T. Middlemore, one of Birmingham's most generous citizens, some very valuable pictures on condition that the Corporation should build a new art gallery. If this offer were accepted by the City Council he hoped Birmingham would have a new art gallery worthy of the pictures it would contain, but he recognised that the erection of the proposed new gallery would not be without its difficulties. It must be connected to the present municipal buildings by a bridge across a street, and he feared that an angel—much less an architect—would be puzzled to give them all that they wanted. To design this bridge so that it would be in character with the new building and also in keeping with the old, would not be an easy matter. The bridge must be as light and beautiful as a dream, and yet be substantial enough to take six aldermen abreast. He was glad to see that the "severe order of architecture," as Mr. Morris called it, was dying out and that buildings with cemented fronts were not now being erected. The fashion in architecture was always changing. To-day it seemed to be the reign of terra-cotta, and those who were having new buildings erected at the present time might feel as confident that terra-cotta materials would be used as that there would be extras on the architect's specification. In all new public buildings it was desirable that there should be some endeavour to elevate the taste of those people who spent so much of their time in factories by showing them specimens of architecture which would have an ennobling influence. Mr. Ruskin had said that industry without art was brutalising, and he was glad that the members of the architectural profession often persuaded their clients to erect much finer buildings, and buildings which were more creditable to the city, than, without the architect's advice, would have been provided. In London of course they would always find the best buildings. Every agency, every insurance company, every bank, must be represented there by an imposing architectural structure. The theatres erected in London during the last few years alone were almost a school of study in themselves, and in his opinion the only public buildings in London which were absolutely out of date were the railway stations. With one exception the London railway stations were very ugly, and most of them devoid of any beauty at all. If only the members of the Royal Institute of British Architects had a free hand—and of course railway companies would not carp at a few extras—what a transformation they could make!

Mr. Powell Williams, M.P., in response, said the Houses of Parliament were impressive, stately, and appropriate, notwithstanding the insignificant fact that the Second Chamber was at all capable of holding the persons for whose accommodation it was intended. That, perhaps, did not matter very much, because he had not himself observed, except on very special occasions, any particular eagerness on the part of the peers to be present in their places. There was something about the Houses of Parliament themselves which showed on the part of the man who designed them a real genius for his profession, and it was sometimes a matter for wonderment that their style and form were not more frequently copied. The exterior looked all tranquillity, and that was a considerable advantage considering what sometimes took place inside. Internally, the structure answered its purpose very well.

The Chairman then gave the "Corporation of Birmingham. As he travelled towards Birmingham that afternoon, he said, he was utterly at a loss what to say about its Lord Mayor and its Corporation, because Birmingham municipal life was a subject of which he was profoundly ignorant. But on reaching the suburbs of the city he looked out through the window for an inspiration, and saw a tall chimney and some smoke. These gave him what he thought would be a good subject. Architects regarded smoke as their most determined enemy, for it destroyed material, and form, and colour, only leaving proportion as a distinguishable feature, and proportion was, unfortunately, the feature in which architects were mostly deficient. Smoke they, as architects, were well accustomed to. All great schemes

began in smoke; some continued in smoke; and not a few ended in smoke; but no one could have failed to recognise that in the last few years great progress had been made by all municipal institutions. Wherever they went they could not fail to notice the magnificent buildings put up by the great provincial towns—greatly to the benefit of the architects' profession, many members of which were thereby enabled to make fame and, it was to be hoped, also fortune. On reaching Birmingham he perceived that the city was not enveloped in the dusky cloud he had expected, and his one topic for discussion was therefore taken from him. But during the short time he had been in Birmingham he had been surprised to see the magnificent scale on which public improvements were carried out. Their new street, for instance (Corporation-street), was carried through in a straight line without any of the awkward curves and corners and unexpected divergencies they met with in all the later so-called improvements in London. It was a very great thing to find a municipality carrying out such great improvements, and yet these improvements were in one sense not without their disadvantages, because, when one great scheme had been carried out a still greater one was next demanded. With the greatly-increased powers given to Municipal Corporations more was now expected from them—not only new thoroughfares and similar improvements, but pellucid rivers and stately embankments, and public buildings of palatial and sumptuous architectural design. All these they looked for in the future; but there were many other important works—the dwellings of the poor and the working classes, for instance, demanded not merely actual buildings, but buildings containing some element of art which should spread its ennobling and elevating influence on the minds and feelings of the greatest possible number.

The Lord Mayor, whose name was coupled with the toast, replied. He said that, although Birmingham could not always be engaged on magnificent buildings which afforded scope for the great leaders of the architectural profession, they were continually extending in the suburbs, and even in the centre of the city the renovations which were taking place must afford great opportunities for the rank and file of the architectural profession. They had done something for the profession by their extensions, but they were doing more for the profession in another direction. For the prosperity of the artistic professions it was essential that there should be a public capable of appreciating art, and the Corporation of Birmingham for some years past had been giving special attention to the education of their young people so that they might become able to realise the beauties of architectural design. When they had been educated sufficiently the young people would be able, in a walk through the streets of Birmingham, to see every variety of architectural design—more or less embellished or disfigured by that smoke to which the Chairman had referred. With this great variety of architectural design it was no wonder that already, without waiting for the development of the critical faculties of the young people, they had a great variety of criticism, and this criticism came quite as much from the members of the architectural profession as from any other source. He could not assume that any of the architectural criticism arose from professional jealousy, and therefore he concluded that there was a wide diversity of opinion among architects at the present time as to what really was good, bad, or indifferent in architectural work. This led him to ask whether the rising generation of architects was taking advantage of all the possible opportunities in art education. To that question he did not know the answer, but it was quite certain that if they were not, and if the public were being educated in art at a greater rate than the members of the artistic professions, there would be something very much amiss in the future. Passing on to speak of the relations of municipal authorities with the architectural profession, the Lord Mayor said that, taken individually, the members of the Birmingham Corporation, for instance, were excellent men of business, but when they were taken collectively they often sacrificed business instincts for what they considered to be of greater importance—matters of principle; that was so particularly in regard to architectural matters, and he often felt that it would be wiser as a rule on the part of the Corporation

to discuss architectural matters in the same way they would if they were acting as private individuals, and not to blindly insist on a competition, whatever the subject might happen to be. While recognising the advantages of competitions as a rule, he thought there were exceptions when they would like to break away from that rule and talk over with the architect any proposed new building, in the same way as they would if they were acting privately for themselves.

Mr. J. T. Bunce proposed "Architecture and the Kindred Arts." He asked his hearers to consider what a large and weighty subject his toast dealt with—Architecture, the oldest and most venerable of all the arts; the art which in its principles and in its visible form and in its developments from the age of the cave-dwellers to our own day embodied and recorded the growth of civilisation and the history of human progress; the art which had not ineptly been described as "the printing press of all ages." Then the other part of the toast—the Kindred Arts; mainly the arts of sculpture and painting with other forms of internal and external decoration. As to how important these were, and how closely they were related to architecture, there was the testimony of two eminent witnesses. M. Viollet le Duc said in his "Lectures on Art" that "sculpture and painting are to architecture what the drama and poetry are to music—its derivatives, its necessary complements." And Mr. Ruskin, speaking in his broader and stronger way, declared that "there are only two fine arts possible to the human race, sculpture and painting. What we call architecture is only the association of these in noble masses, or the placing them in fit places. All architecture other than this, in fact, mere building." Speaking before so many masters of architecture, he would not venture to contest this dictum of Mr. Ruskin, nor attempt to trace the growth of architecture and its kindred arts in their infinite developments. The only course to be followed on that occasion was to relinquish a hopeless task and put aside such a tremendous theme. The toast was to be replied to by two gentlemen well known in Birmingham, one an artist-architect, and the other a generous benefactor who, by his appreciation of the highest form of art and by the munificence of his gifts to the community, had made his name famous throughout the country. It was therefore of Birmingham that he desired to speak and to show what advances in living memory had been made in the promotion of architecture and its allied arts. Not so very long ago Birmingham was an ugly town. Art was not unknown in the town, for Birmingham had produced some great painters and a fine succession of great engravers; the Society of Artists had kept steadily for many years a brilliant light; and there were in private hands several fine collections of pictures. But the community itself had done little for art in any form but that of music. Excepting the Town Hall there was no public building of distinction; the chief streets were narrow, ill-arranged, mean in their architecture—a poor, debased, sham classic being their main characteristic in this respect. Factories were hideous in their plainness, and but for a few examples of fine half-timber work—now unhappily mostly swept away by the so-called "march of improvement"—houses were devoid of taste in design, consisting, as a rule, of the familiar rectangular boxes punctured at intervals with holes to serve as doors and windows. Now, thanks to municipal spirit, to advancing education, and to the skill of later architects, what a change had come over the town! They now had broad and handsome streets, cut through once-congested areas, and giving free play to light and air—streets which would bear comparison with the best in any town in the kingdom. Though Birmingham still possessed some public buildings of which Birmingham folk were not inordinately proud, there were others which showed a great measure of progress, such as the noble Parish Church of St. Martin, the Mason College, the School of Art, the Midland Institute, the new General Hospital, and the exquisitely graceful Victoria Courts, and they had also a singularly fine series of Board schools. The newer factories and warehouses were, many of them, stately structures, the shops were often marked by artistic quality, and a large proportion of suburban dwellings erected within the last twenty-five years recalled the days when English domestic architecture was at its best and highest. He did not say that they had attained it, but in much of recent architecture architects and their



clients had striven to work with the spirit of those great Italians, who, at a happy period, united the strictness and severity of Gothic with the richness and freedom of the early Renaissance. In not a few buildings, public and private, the aid of the kindred arts of sculpture and painting had been called in, the former freely, and, as to the latter, it was something to have enriched the Town Hall with mural pictures, and a great thing to possess the magnificent series of Burne-Jones windows in St. Philip's Church. Much more had been done than this. The education of the people, particularly in the artisan classes, in the principles and methods of true art, in the museum and art gallery and by the Municipal School of Art (which included an architectural school), had been attended with a large measure of success. These details of local progress merely touched the fringe of a great subject into which he could not more deeply go. He therefore gave the toast of "Architecture and the Kindred Arts." Architecture, impersonating her as the Mother of the Arts—recognising her majestic unity, and yet the grace of her infinite variety—placed between her handmaidens, Sculpture and Painting, inseparable from her as the complement of her structural designs and as the necessary enrichments of the royal robe she wears. The names of Mr. Bidlake, artist, teacher, and designer, and Mr. Middlemore, patriotic donor of priceless works of art to Birmingham, were coupled with the toast.

Mr. W. H. Bidlake, in responding, said that although the exclusive spirit of early times had passed away and a broader and more altruistic one had taken its place, architecture, if she were true to her traditions, would still express, as she had always expressed, the ideas and ideals of the times. In Birmingham the commercial and the municipal ideals were dominant, and he believed it was quite possible for architecture to express those ideals as well as to express the ideals of more classical periods. The municipality no doubt owed much to architecture, and architecture in turn owed much to that broad and enlightened municipal spirit which required not only that a building should be useful but that it should also be beautiful.

Mr. J. T. Middlemore, also replying, said that art in England had much to congratulate itself upon: the multiplication of schools of art, the appreciation of what was really good in art, whether applied to buildings or to pictorial art, and the dissatisfaction generally felt with the pompous, the pretentious, and the unbecoming. The dignity of the calling of the artist had been raised enormously within the last half century, and artists themselves would acknowledge that the emoluments of their art had been much increased. It would be interesting to hear some explanation of what produced good and great art amongst a community nowadays. The great mediæval art was produced by a great Christian inspiration, accompanied doubtless by a revival of learning, and an earnest and thoughtful outlook on life. A deep faith, no doubt, produced a great art, and the deeper the faith the higher would the aim and effort of the artist be to do justice and to give reality to his work. Looking at our own times, it seemed to him that the same mental and moral forces which produced Watts and Holman Hunt, Burne-Jones and Millais, also produced Coleridge and Wordsworth, Tennyson and Browning, Newman, Liddon, and Westcott, Carlyle and Froude, Sir Wm. Hamilton and J. S. Mill, George Eliot, Dickens, and Thackeray. A spiritual course aroused the energies of these great people, and without its influence those energies would have lain latent or only half aroused, but on the whole the nineteenth century had deserved well of its children intellectually, morally, and artistically. What of the twentieth century? To him it seemed that one of the most notable spiritual forces would arise from the intense desire that to all, even the poorest, every possible means of culture should be open to every man, and have a chance for the growth and development of his own nature. This intense desire had produced our present galleries, and libraries, and schools, and it would, he trusted, grow into a great formative inspiration, under the influence of which men might be less worldly and selfish, and life be simpler and nobler, and even art itself more sincere, more great, and more elevating.

Sir Benjamin Stone, M.P., in proposing "The Royal Institute of British Architects," detailed his familiarity with all the great architectural works of the world and declared his high conception and exalted feeling for archi-

ture and for the ennobling part it had played in the history of the world. All could not now be architects, but to architecture even the layman owed a duty, that duty of respecting and preserving the ruins of ancient architecture from the vandalism one met with every day—vandalism which was a disgrace to modern society. Only on the previous day he went into a church by chance and found that a magnificent rood screen had been cut in two because the churchwarden wanted to put in some furniture. What surprised him more was that the same churchwarden had taken some miserere seats and chiselled off the grotesque figures underneath because he thought they verged on impropriety.

The Chairman responded on behalf of the Institute, and said that it would be a great pleasure for him to report to the President that their meeting in Birmingham had been so successful. The Royal Institute of British Architects existed for several purposes—for the advancement of the art of architecture and for the protection of the architects themselves. By the great extensions it had recently made in connection with allied societies, now numbering no less than seventeen societies in different parts of England, and even extending to Australia—they had naturally increased their influence and at the same time they had created a bond of brotherhood which they were anxious to sustain and keep. Speaking of the proposed University for Birmingham, Mr. Florence said that as the proposal had excited such a great deal of attention and interest he thought it advisable to see what subjects had been specially taken up at the University. He was surprised to find that, in spite of the great influence of Sir Benjamin Stone, and all they had heard from the leading lights of the City, and from members of the City Council that night, architecture was not included in the scheme, and he was afraid that public interest in architecture was not quite so sincere or so enthusiastic as the proposer of the toast would wish it to be. As further illustration of this he would refer to another city, at least as well known as Birmingham, where, in public advertisements for an architect to be engaged in the superintendence of the construction of some great works, the architect was to rank the same as a tramway director. He would be put on the same level and receive exactly the same salary. That, he was happy to say, was not in Birmingham.

Mr. W. M. Fawcett, Vice-President, gave "The Birmingham Architectural Association and the Allied Societies," and commended the Institute for having thrown open its arms and endeavoured as far as possible to join the country members with it in forming a mutual body for the representation of the profession, and for promoting the general good and maintaining the high standard of the profession.

Mr. C. E. Bateman, President of the Birmingham Architectural Association, and Mr. R. I. Bennett (President of the Manchester Society of Architects) replied, the latter remarking that he was looking forward to the time when, by the aid of the examinations, their profession would be made as close as that of the law.

Mr. Aston Webb proposed "The Guests" and the Rev. A. R. Vardy having briefly replied, the company separated.

#### THE ARCHITECTURAL ASSOCIATION: THE POSITION OF ARCHITECTURE AMONG THE FINE ARTS.

THE usual fortnightly meeting of the Architectural Association was held on Friday last in the Meeting Room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. C. H. Fellowes-Pryne, President, in the chair.

The minutes of the last meeting having been read, and Mr. W. Milner having been elected a member, the Chairman announced that the lectures by Mr. Max Clarke on Drainage and Water Supply would commence on Thursday, January 5.

Mr. Edwin T. Hall then read the following paper on "The Position of Architecture Among the Fine Arts":—

The subject on which I essay to address you this evening is one of so wide a range, a subject on which so many books have been written, that I cannot hope to treat it fully in the limited time at our disposal, but only rather to suggest matter for reflection; and I must at

the outset ask your kindly and patient consideration for my shortcomings.

In approaching a subject like this, one is at once face to face with the necessity for definitions, and the two at the base of our fabric are: What is fine art? What is architecture?

I suppose we are so used to these terms that we feel rather a shock in being asked if we really understand what we confusedly know.

Fine art has been defined as that power whose great end is to give pleasure, and the pleasure we have in contemplation is the higher or intellectual to the exclusion of the lower and sensual. The vehicles by which this higher pleasure is conveyed to us are, of course, the senses, so that we get sensuous and intellectual, or reflective pleasure. By hearing and by seeing, fine art is appreciated, and the pleasure it affords is the greater in proportion to its permanent retention by the intellect, and in proportion to the tranquillity with which it is so conveyed.

Fine art has been also defined as the representation of an intended idea, the expression of an idea in matter, while the ideal in art is the rejection of a rude and crude act to illustrate an emotion and the selection of a more subtle and poetic mode of illustrating the idea.

The definition of architecture varies almost with every writer on this subject, and one is sometimes appalled to hear the courage with which a young architect speaks, and, with the confidence begotten of enthusiasm, lauds this building as good architecture, and decries that as devoid of architecture. What is this art of architecture? Mr. Ruskin says in one place "it is a science of feeling more than of rule," in another it is that which "taking up and admitting as conditions of its working the necessities and common uses of the building, impresses on its form certain characteristics visible and beautiful, but otherwise unnecessary." So that in his view architecture is a gloss separate or separable from the building.

Mr. Fergusson defines architecture as "the art of ornamental and ornamented construction." To emphasise this he says that in a building it is the art of the engineer which consists "in selecting the best and most appropriate materials, and using them in a scientific way, and where the engineer leaves off the art of the architect begins." In other words, the planning and the constructional design of the building are works anterior to the "architecture" of it, this being a superimposed ornament. Indeed, he gives us an illustration of a building, and shows how he adds architecture to it. M. Viollet-le-Duc takes a different view. He says "Architecture and construction must be taught together. Construction is the means, architecture the result. Architectural construction is the employment of materials according to their quality and their adaptability with the idea of satisfying a want by the most simple and solid means, giving to the constructed object the appearance of durability and proper proportion subject to certain rules imposed by the senses, reason and human interest." Briefly, a building must be devised by one mind so using construction as to result in a work of architecture described as having specified aesthetic properties.

Mr. Eidlitz's definition is less involved than that of M. le-Duc, and carries the point further. He says, "Architecture is the art which models buildings, which teaches the development of structural forms," the word development comprehending the continuous evolution of architecture as distinguished from its crystallisation into styles.

Mr. Statham, in his recent work on "Architecture among the Poets," defines architecture "from one point of view as the realisation of an imaginative conception in composition and outline; from another as the craft of building."

The first part of this, it seems to me, is well stated, and it might be added that the architect sees mentally the completed building beyond and through the veil of his drawings. The latter definition, however, appears to me to be involved in the former, because, as Le-Duc says, the craft of building is merely the means used to attain architecture, which is the end. A drawing can never faithfully represent a building; the depicted block lacks density and an aerial separation from its surroundings. To us who pass our lives among drawings they become a sort of shorthand, and are intelligible in a way they can never be to the uninitiated.

Hegel defines a work of art as the interpenetration of matter and thought. Viewed in this light, the matter in an architectural production



is so relatively massive and intractable that to penetrate it with thought is the goal for which we must laboriously aim, and he who can subordinate the material to the mental in such a production is entitled to rank as an artist, and to rank higher than other artists in proportion to the difficulties of the material in which he has to express his ideas as compared with those in which they have to work.

Having endeavoured shortly to put before you some conceptions of fine art and architecture, I will ask you to consider with me the relations of the fine arts one to another in their mode of expression, and from this to endeavour to find what is the best rule of life which will help us most to carry forward the banner of our own art.

We shall speak of the arts of music, poetry, the drama, painting, sculpture, and architecture. Of these painting, sculpture, poetry, and the drama are imitative, music and architecture creative.

All ideas in art must be expressed in language understood of the people, its essential to convey the artist's meaning by depicting something in imitation of or based on principles observed in nature, that is in real life. That this is done in painting, sculpture, and the drama is self-evident, but it is also the same in poetry. The poet's conceptions are descriptive of man or of some other work of nature, and the vivid portrayal of the scene or effect desired is a measure of the artist's power. Thus in the *Iliad*, and *Odyssey*, Homer's gods and warriors and women are pictures appealing to us by our power to realise them, and the more subtle pictures of poets' thoughts are conveyed by imitating that which we can grasp from general knowledge.

All the imitative arts may raise the subjects they depict from the commonplace to the ideal, and the abler the artist the greater his success in this direction.

Music has nothing to imitate. It is a spontaneous creation, and it may convey to the mind suggestions of anything or everything in nature.

It is probable that music of a kind is almost as old as speech, and we know that at least thousands of years ago musical instruments were used. There are representations of such instruments on Egyptian monuments, and we have descriptions of them in elaborate variety as in use in Assyria and Babylonia.

The European music of to-day, the opera, the oratorio, are but a few centuries old. These originated in the fifteenth or sixteenth century, at the time of the great Renaissance. From the exhibitions we had in London a few years ago of Japanese music it would seem that in the extreme East no such development has taken place. That music is but a rhythmic cadence of few tones.

Here it has attained such a development that it speaks to us in a language of its own, quite apart from words. It portrays all emotions. But it seems to me it differs from all other arts, in that it is almost incapable of pandering to the lower passions; that, used with the accompaniments of words and dramatic action, it may and does minister to sensual tastes; but alone it breathes a purer air and tends always to refinement.

Luther says, "Music is the grandest and sweetest gift of God. Satan hates music; he knows how it drives the evil spirit out of us." And many of us can speak of our own experience how often in the battle of life, when we have been almost in despair, music has calmed and softened and elevated us, faith and courage have revived, and we have been renewed to greater exertion.

Poetry would appear to be of later origin than music, in that its aim has been to depict that which pre-existed in the human history, or prophetically to discourse of that which is to be. It is the adornment of expressed thought in any form. We recognise it in descriptive histories, and probably no more poetical piece of writing can be found than the Book of Job, written many centuries before Christ. It is a book which Mr. Froude, the historian, goes so far as to say "will one day perhaps, when it is allowed to stand on its own merits, be seen towering up alone, far away above all other poetry in the world."

The influence of poetry on the race is diverse. It may exalt or elevate the soul, it may debase it. Poetry, being a form of speech, can be artistic while it panders to the lowest of our natural appetites.

The drama is a form of poetry depicted by

action. Whereas the epic poem appealed to the ear, the drama appealed to eye and ear by a more vivid and realistic representation, exciting more profoundly the interest of the audience. In historical sequence it was later than either music or poetry. Probably its date is the sixth or seventh century B.C. Its influence is great, but it is evanescent. It is an acted sermon whether its aim be high or low. It is taken not as daily food, but as an occasional tonic.

We now come to that art which is primarily the subject of our consideration to-night, and as such we must consider it in greater detail than the other arts. I propose to consider it together with the sister arts of painting and sculpture, as they have been so intimately associated with it.

When the necessity first arose for man to build in order to protect himself from the elements or his natural enemies, his buildings would take their form on strictly utilitarian lines, using the material readiest to hand. Thus in a timbered district a conical hut of wattles covered with leaves would be the first form of shelter—suggested by the drooping branches of a tree—and in an arid or stone district the earliest form would be doubtless the excavation of a hole under a large flat surface slab, the sides of the excavation being lined with stones to support the edges of the large slab and prevent it slipping or causing the earth on which it rested to give way under its weight. Many such can be seen in Brittany to-day.

As the family or clan increased and, with its increase the feeling of greater security obtained, the wattle hut would give way to the larger timber room, and the burrow would be replaced by the building up of stones above the earth to form a walled enclosure.

The existence of large flat stones would suggest the formation inside the enclosure, against its outer walls, of a portion covered with flat slabs supported by pillars of stone on the inside, and this feature in principle is preserved to this day in the cloister or ambulatory of courtyards and ecclesiastical buildings in the West, as well as in the older buildings of the East.

In Iceland a large native house is now but a series of detached wooden rooms joined together by a corridor.

The high pitched roof arose in countries of heavy snows, and a wise conservatism retains it in variable climates. The accessible flat roof belongs essentially to the tropics or hot climates, its purpose being to afford opportunities for getting the greatest amount of air by day or by night.

Architecture was born when, in the contemplative mood of leisure, the man of the stone enclosure began to reflect that the pillars of his colonnade might be arranged not at the distances necessary to support the various sized stone slabs which came readiest to hand and were used as covers, but at regular intervals, selecting his cover stones to suit; and that he might reduce the rude outlines of his pillars to regular shapes; and the man of the timber house began to think that he might, instead of having a lot of detached rooms, put them together under one roof, and when they were so joined might remove the separating walls of some and place pillars in their stead.

Gradually with the process of political and social education which taught him and his neighbours to live in mutual dependence, would come the recognition of the necessity for order and organisation, and these applied to the home would develop the architectural faculty of convenient planning, and so on until the rude congeries of rooms would become an architectural entity, symmetrical and rhythmic, and thus would be evolved what Ferguson calls "the æsthetic form of the technic art."

A further development would arise when assured of the stability of the Commonwealth. Man, in contemplating the grandeur of nature, the sublimity of its outlines, the mystery of its forests, the dignity of its rocky terraces, the massing of its lights and shades, would reflect on the mysterious powers which dwell in these, and on the laws which control the seasons and the storms, and a desire would arise in him to do honour to the Unseen Author of these mysteries by erecting a temple. In such a building the narrow limitations of domestic life would have no place, and the architect, attuning his mind to this great Author, and finding within himself a reflex of that Author—a creative power—would reverently set himself to produce a work which

should, in however dim a fashion, reflect the emotions with which nature and his subject had impressed him.

In such a structure there would be no place for the lighter moods of life. The predominant key would be dignity; its harmonies, repose, mystery, and symbolism; their combination appealing to mankind in its contemplative mood, conveying an expression, as Ruskin calls it, "often serious and sometimes melancholy—an equivalent for the sorrow, trouble, and mystery of human life." It is by gradual process we thus see the art of architecture vivifying the dry bones of construction, and making them live and speak.

This spirit once aroused would permeate the world.

The palace would come next, in which the oratorio would be replaced by the opera, expressive of the various phases of life. The broad outlines of the structure would be representative of the dignity of life as a whole. Subordinated to this, the various parts would appropriately express the lighter moods.

In the temple the mysterious attributes of the Deity would be symbolised and the phases of His worship expressed. In the palace the glory of the Man would be emphasised and enhanced, so that the stranger should be impressed with his majesty and importance. The enclosure would mark that the King's abode was set apart. Through its stately portals, as through a frame, the eye would be led to contemplate the picture within, and a visitor, conducted for the first time through its courtyards and vestibules, its colonnades and halls furnished with the pomp of armed guards, the peopled busting of a busy place, would be emotionally affected, his senses impressed, and his mind prepared by the time he reached the hall of audience to render homage to the master mind. The effect I have endeavoured to sketch is recorded of the Queen of Sheba when she had been conducted through King Solomon's palace and had seen its magnificence, "There was no more spirit in her."

From the palace the spirit of architecture would, through the ages, percolate downwards, its steps growing slower and its form attenuated as it receded from the centre of wealth and leisure, of culture and refinement, until it would evaporate at the abodes of grinding poverty, at the factory where Mammon alone was worshipped.

And here parenthetically I would dare to dissent entirely from Mr. Ruskin where, in the "Seven Lamps," he inveighs against the external artistic treatment of trade premises. He says you must not mix architectural ornament with business, but should only use it for places where you rest. I venture to affirm, on the contrary, that in the refinement of the tradesman's surroundings there is most hope for raising the artistic standard of his wares and fabrics, and indirectly of his customers. It seems to me that the external treatment of every building is a matter of the deepest concern to the man in the street; indeed, every building owner in a city should be encouraged to recognise his responsibility in the architectural treatment of his building as part of the whole street, just as in his moral conduct he has a responsibility to the community.

Architectural ornament is to building as the leaves and blossoms are to the structure of a tree—an artistic development of the skeleton, evidencing life—a perfecting. But, like the leaves, it should be characteristic of, and in harmony with, the structure within.

The relative position of architecture among the associated arts of painting and sculpture may be likened to the relation of trees to flowers. The trees are the more stately, the broad features which give dignity and masses of subdued tone to a landscape; the flowers the decorative colour and brightness.

The tree in its perfection is, so to speak, a part of the landscape. Painting and sculpture are more like the flowers of the earth, bright, poetical, refined. They must be examined near and in detail. They are the companions of leisure and of ease, while an architectural composition is for him who runs to read, for the virile man, the man of activity. So that for a monument to record a great victory or a national achievement, an architectural building is appropriately the medium almost universally chosen, while the sister arts are selected to record a pageant, an act in the great drama—in short, to depict the detail rather than the mass.

Architecture seeks to express the more per-



manent in nature; sculpture and painting the more evanescent, the ever changing.

The picture, too, has a frame to enclose it, to remind the onlooker of its limits. A work of architecture has its own proper place under the vault of heaven and calls out that it is part of the actual.

Now, to be of any living and vitalising value we must bring home architecture to our daily life and surroundings. I ventured last autumn, in speaking to your President's address, to suggest a doubt as to the wisdom of teaching architectural history in the early stages of the Architectural Association curriculum, and proposed rather that the student's mind should be first trained to understand the principles of art and of design, not only by studio work, but by the study of buildings, the history coming later when his trained mind would know better how to appreciate it. Shortly afterwards the Bishop of London, discoursing to teachers of the School Board on learning, said it was useless to start a child's education with the Witenagemote, and that it was better to teach him Constitutional history by starting with the actual around him—with the policeman whom he knew—and from the present to lead him back step by step, by which means, said the Bishop, he could learn to appreciate history and so get back to the cradle of our Constitution. I feel that is our best position.

We should strive to learn the principles constituting the basis of design and to apply the knowledge of construction we possess now—a knowledge wider far than any possessed by the ancients—to meet contemporary wants.

Do not suppose I am belittling the study of history or deprecating research. These are of immense value to an architect, but one may be learned in them and never be an architect.

Nothing is more cramping or sterilising to the mind than, by becoming saturated with history, to become the slave of "style," be it Classic, or Gothic, or anything else.

To design in a recognised "style" is to arrest all art progress; to always seek for and follow a precedent, be it for grouping or outline, for planning or moulding is the negation of art. It is living in the dead past, in a world whose aspirations, whose moral life, whose callings have but little relation to those of our day.

Mr. Fergusson tells us that the "correct" proportions for a room, others what are the correct proportions of a column of an entablature, &c. As Mr. Bidlitz very properly remarks, "if rules of proportion existed, and a knowledge of them enabled men to produce great architectural monuments, architecture would become a trade, and not an art."

My younger friends will say all this is true, but so true that it is unnecessary to speak of it. But I would ask them to look around, to study the buildings only within the earlier years of this century, to read, when they have nothing better to do, the literature of the battle of the styles fifty years or so ago.

Mr. Ruskin, in one place, says we are unwise to build in any other style than that of the pointed arch, "because it is the strongest in structure and a beautiful form, while the square head is both weak in structure and ugly in form."

The Egyptians and Greeks did not think this. They certainly knew of the arch. We have recently heard of the discovery of a brick arch in the tomb at Denderah erected 4,000 or 5,000 years ago, and yet the architects built their great monuments in the trabeated style.

The fact is, we are all inclined to worship the great achievements of the artists of the past, and to regard their work rather than the spirit and principles which underlay their work. Had our great mediæval church builders been trammelled by precedent and style, how would their marvellous art achievements have been produced? We should never have had their masterpieces to glorify the land.

That which places architecture above the sister arts is that while they, with few exceptions, of necessity record emotions and ideas of the past or present, architecture is, or should be, ever labouring to bring forth a new organic creation, something in sympathy with the needs, the developments, the aspirations of the times.

I want to emphasise this word *new* because the aim to be original is often spoken of as though it were a reproach. I am not defending wild and extravagant designs—though even they show life—but it is of the essence of vitality in art to depict that which has not been, to increase and multiply forms.

You will remember in Viollet-le-Duc's

"Habitations of Man," there are two principles represented by Doxious and Epergos. Doxious who sees only in ancient architecture the *summum bonum* of art, and resents all change, who when he travels through the world for thousands of years is always with a sigh looking back to Egypt. This is the spirit of the rules of proportion, the worship of style, the negation of progress in science and art. Epergos, on the other hand, sees in the evolution and development and in the new offspring of architecture an evidence of godlike powers given to man, an evidence that life and not death is the keynote of the world, and he urges us on to strive, not stagnate.

If we approach an architectural design from the point of view of grasping the purposes for which the building is wanted, so planning it that its various parts adapt themselves to those purposes in such a way that all seems natural and harmonious; making the entrance-hall impressive and expressive with dignity, spaciousness and hospitality; arranging our windows so that the light shall suit the purposes of the various apartments, aerating with sunshine the various cubes so that sweetness pervades everything, breaking our large floor areas by columns, forming little surprises by arched recesses or galleries affording views of any particular picturesque groupings, and making all to grow naturally from our construction, we may produce that which will be both artistic and individualistic, an evidence of thoughtfulness and of the creative faculty. I suggest this in opposition to Ruskin's or Fergusson's theories about a building pre-existing with the architecture added. I suggest that a good plan, well thought out on the lines I have roughly endeavoured to sketch, is a work of architecture, although the exterior may be absolutely plain—nay, even uninteresting.

It is, alas! too often the case in commercial buildings that one is not permitted to make the exterior interesting—not allowed even to express or emphasise the leading lines of the composition; and in so far as this is the case the work is incomplete; it is, in fact, a sound conception not allowed to attain maturity. The Cave Temple of Kali (between Bombay and Poonah) is none the less a work of architecture because, with the exception of one end, it is on every hand walled in by the rock hill in which it has been excavated.

If, however, the exterior is to be ornamental, this effect should not be attained by added ornament having no relation to the interior, but the decoration should harmonise with and suggest the interior and its occupants, just as in a work of sculpture the exterior of a figure suggests the internal framework—the well-developed muscles, the network of nerves, and, above all, the impulse which actuates them.

To attempt a work of architecture by first settling the exterior and then designing the plan and general interior to lead up to it is fatal.

As an illustration of the correct principle of design, let us consider the idea of a Town Hall. It is first the centre, the heart, of municipal life, whence all other parts of the municipality are governed. It should thus be placed in the centre of a town, in an open square or place. Its various departments—or, to use a conventional phrase, its cells—should be emphasised externally and internally.

The emotions pertaining to each should be considered and depicted, or rather suggested; the relative importance of each to the other should be weighed in locating them; the prison cells, the Courts of Law, the offices, the entrance and assembly halls, the suite of reception-rooms, &c.; simplicity of plan and easy access to the departments being essentials.

The physical proportions of each group should evolve from these considerations and, in the mind of the architect, the exterior should grow *pari passu* with them, and should express each group and the unity of the whole.

The design of the exterior should also stamp with expression the mechanical functions of the several parts of the construction, and thus, as the various members of a human body are fitly joined together, the whole conception will convey to him who has eyes to see and mind to appreciate, the idea sought to be expressed.

In times not long past these principles were ignored and the exterior was designed, or rather copied, from a Classic temple—from a building which externally expressed faithfully the one cell which it contained, the abode of the god.

Such an exterior has no relation to complex buildings of to-day. Or let us take at the other end of the scale the idea of a workman's small dwelling. My friend Dr. Godfrey Sykes, a well-known Medical Officer of Health, remarked to me lately that the solution of the problem of housing the million should be regarded from the sanitary, social, and ethical standpoints. Now the backbone and basis of our social polity in England is the home. The idea of a home is lost when a family is compelled to live in one room. What, then, is the idea of a home? Its central feature is the place of reunion of its various members—the living or common room—well lighted by windows and warmed by a stove or open fire. Where outlay must be restricted, we cannot waste money on passages, and there can be no objection to let the common room be a central hall, with bedrooms opening from it on two sides, the third side containing the scullery, water-closet, &c., disconnected by a ventilated lobby. Each bedroom should have a window and a ventilating flue, while the heat from the common room stove will be sufficient to warm the bedrooms, and so save both the cost of fireplaces and of fuel. Such a humble dwelling will be a home, and a congeries of such homes may be placed side by side in the country or one upon another in a town. In the latter case the staircase should, of course, be external to the houses. The aesthetic in such a dwelling as we have described can be expressed in simple ways, in little thoughtfulness of detail, in showing consideration for the housewife's wants and aspirations, making windows that will take flowers, in provisions for fostering modesty, &c.

In considering the expression of construction let us compare two types of buildings, and see the relation of construction to the design. Take a barrel-vaulted church. This vault, having an equal thrust at all parts of its bearing on the wall, demanded and received for its support a massive wall equal in thickness throughout its length, with relatively small openings. In such a case, buttresses at any points would be out of place. By contrast, take a groined vault; here the weights and thrusts are concentrated on points, the wall between these points is but a screen, and can be light in treatment, and may be pierced with windows of any size. The points of support, however, require to be of large horizontal section, and buttresses become necessities evolved from the construction. Did time permit, we could trace how this groining and concentration of loads led to all the characteristic features of Gothic design. In Viollet-le-Duc's "Rational Building" we have the whole scheme worked out.

It has a peculiar bearing on the subject of our paper, because it shows how practically a new art development was laboriously worked out from construction.

It teaches us that "art is the result only of sober, cool, intelligent thought and technical knowledge, which is acquired by hard, persistent, and long-continued labour," and further, that that labour evolved a result not otherwise to be attained.

M. Le Duc shows that practically the Romanesque builders had before them the remains of Roman vaulted buildings in their country and nothing else. They were not travelled men, they were too poor to import architects from abroad, and not having the command of unlimited labour and wealth like the Romans, they set their intellect to work to devise some means of getting similar results with home material and with home labour. Our author shows how, in the earlier part of the eleventh century, they built barrel-vaulted churches and halls which half a century later fell down; how, profiting by their failures, they again set to work with renewed energy and experience, and gradually, by slow but certain steps, evolved the Gothic groined vault; how this in turn led to the plans of piers, how the capital became a corbel, instead of being, as it was in many Egyptian, Grecian and Roman buildings, not a support but only an ornamental termination to a column. This may be seen at Edfoo, where the abacus is of the same width as the diameter of the column, while the capital is projected far beyond it; or, in other examples, where instead of abacus there is a square shaft between the capital and the entablature; and again in the groined vaults of some of the Roman thermæ, where the plan of the vault abutment is a square of the same dimension as the diameter of the column supporting it; above the capital and below the



vault springing is placed the complete entablature of the Classic order.

In some churches, both in Normandy and in England, capitals are dispensed with; but this appears to give weakness to the design. A mark of separation between the function of the arch and that of the pier is of great phonetic value, and as such the capital or impost moulding has commended itself in the great majority of our buildings.

Reverting to the Gothic art-craftsmen, we note how they carried down their arch mouldings into shafts on the face of the reduced piers, and so step by step and line by line a new art development—a new architecture—grew out of and was determined by the construction which it boldly displayed. Gwilt says "There is more constructive skill shown in Salisbury and others of our cathedrals than in all the works of the ancients put together."

It is not out of place to note in this connexion that while the Gothic shaft grew downward from the moulded arch, the shafts or fillets on the angles of Egyptian pillars grew from below and terminated in the non-functional capital.

We hear of taste in architecture, we hear of genius, but neither one nor the other could have dispensed with the more sterling and laborious qualities which evolved the new Gothic art, an art which has commanded and still commands the admiration of all who see its harvested fruits.

And here it is pertinent in parenthesis to remark on this much misused word taste. It is often spoken of as an intuitive gift, and many who arrogate to themselves its possession, dogmatise on matters of art as though the appreciation and knowledge of art need no training whatever. Artists are not so easily made. Taste to be of any value or authority must be the outcome of wide observation, of judicial power of comparison, and of education in its widest sense. And even then it is a variable standard which each sets up for himself, the result of his study or environment, and therefore in no way a standard of universal application. To a devotee of Classical architecture, the proportions of a Classic column are in the best taste, while those of a Gothic shaft are barbarous, and *vice versa*.

Of genius in architecture we may say, as Mr. Froude says of the gifts of strength, of wealth, of rank, of worldly power, "It is a splendid instrument if nobly used, but requiring qualities to use it nobler and better than itself."

The architects and craftsmen of our most beautiful Medieval cathedrals evolved their masterpieces, as we have seen, by laborious study of the materials they had to deal with, of the forces exercised by their material employed in different ways, and the constructive features arising therefrom became the motive on which their design was based. The various phases and incidents of Christian worship and ritual then led to the general planning of their building; the nave, the aisles, the transepts, the chapels, the choir, the chancel, the sanctuary—all made subservient to, or rather based on, the cross, the great emblem of their faith—and subsidiary to these, the chapter house, the library, the offices, the cloisters, &c. In every part we see plan and construction emphasised as integral parts of the art expression.

In them there is no room for talk of the work of the engineer and builder first and the clothing of architecture added to this. Architecture as a fine art is everywhere, and the art atmosphere pervades the building not only in architecture, but in painted walls, windows, and roofs; in sculptured figures, traceries, and canopies, in music, in stately processions of men, in waving banners, in adoring congregations—the whole having its main aim in rendering glory to the invisible God, a God whose majesty and mystery, as revealed by Christ, led to the soul's uplifting in a way that must have been unknown to the Greeks, whose gods were but deified mortals of whom their votaries could have had but a measurable appreciation.

These were days when art permeated the masses, in dress, in pageantry, in village festivals, in guild processions. Be it remembered, I speak of the period when the priesthood of the Christian Church were self-denying men, living in a chosen poverty, the teachers, the guides, the protectors of their flocks, drawing to them all that was good and great and generous in rich and poor alike; and before the great canker of worldliness, of wealth, of lust of power, of intrigue and immorality, had sapped their influence for good; before the Pope had in 1489 commissioned the Car-

dinal Archbishop Morton, his legate, to make inquisition into the charges made against the monasteries, resulting as it did in such a condemnation by the legate as justified beyond question the worst of the accusations. In the earlier times Gothic art was a power to raise men. In the degenerate days towards the early part of the sixteenth century it not only lost its power over men, but it came to sink in their nostrils as associated with the falsity of those who had been its leaders and patrons. And with this loss of faith in the Catholic Church, the cult of Gothic architecture as a living and growing art fell into a trance, and so remained for centuries. The moral shock not only brought about the Reformation, it chastened the laity, hardened their natures, made them puritanical. Their reverence of God was indeed intensified. The virility of the people asserted itself, and the horrors perpetrated in the western hemisphere by the most Catholic Spanish nation sent such a thrill throughout England that no wonder the gentle and refining influence of architectural art was replaced by zeal and hatred against the system with which it was most closely related.

The energy of the nation was diverted. It became the instrument of Spain's destruction, and in fulfilment of that mission the great men of the Elizabethan era—Drake, Frobenius, Gilbert, Davis (whose name is perpetuated in Davis' Straits), Hawkins, Raleigh, and many others became the pioneers of that colonial empire of which to-day we see the development. The lives of these men are most interesting studies. That they were impressed with a firm belief that they were doing God's work is beyond question. They were human, and some of them blunt, unlettered men with faults grave enough, judged by our standards of to-day; but Froude, Charles Kingsley, and Towle give us pictures of the purity of their lives, of their chivalry, their devotion to duty. It was in such an atmosphere and with these heroic surroundings that Shakespeare—as we are reminded by Froude—found living models for the finest and noblest of his dramatic characters; so that if art in one of its phases was banished, it in another blossomed in a way that has never been surpassed.

But while Shakespeare in immortal drama wrote of men and manners, of history and philosophy, architecture remained the history in stone of the past and passing ages; of the life of the nation from generation to generation. Take an old church, begun in the early centuries of our English civilisation, extended, varied; her gloomy interior of the earliest period opened up to light by large windows of a later period; modified in other respects from time to time; the roof screen, once the line of demarcation between the clerical and the lay, now denuded of its titular ornaments, often removed from its normal position to enclose a side mortuary chapel or a secular lord's pew. Such a church tells us of the evolution of our history and race—whether upwards or in decadence—of sacerdotalism, of puritanism, of the autocratic king or the revolutionary rabble. The beautiful building—the emanation of man's aspiring soul, the offspring of his highest faculty—the creative—breathes of man's high mission, "its tenderness, its heroism, its regrets, its aspirations," as Oliver Wendell Holmes expresses it. Under her sheltering wing she takes his life during his short sojourn here; she hallows his birth, she blesses his marriage, she mourns his death, and she raised from the earth by his behest, finally takes his earthly part into her reverent keeping.

What so grand as the interior of such a historical work as Westminster Abbey! Her architecture, itself marking epochs in the nation's life, scarred but not marred with monumental records of her sons' self-sacrifice to duty; of their energy, their learning, their great endeavour in all the paths of physical and mental activity. In what gallery of painting or of sculpture can such sublimity be found? Here the sculptor's art appears as handmaid to attend the sister art. Sculpture is most sublime when, as here, it seeks not its own glory but to minister to hers; when it adds the grave and chaste beauty, so peculiarly its own, to the solid qualities of her reposeful dignity.

But while this is true, it is also true that each of the arts has its separate identity, a personality as distinct and as responsible as that of any member of a human family. Each must work out her own salvation, aim for her own ideals, and in such aim she may, and too often does, loosen the ties which bind her to her sister arts.

Yet let us again insist that architecture is organic. Sculpture is a representation of the organic; painting is inorganic, illustrative only.

In architecture sculpture may be used as an organic part of the structure, as figures in a Gothic doorway or as the caryatides in a Classic temple, but in such relation it is an accessory to architecture, a blossom on the tree.

In a somewhat different category we may cite the sculpture on the Parthenon. This is organic, and I particularly wish to refer to the frieze. It has often been conjectured how this frieze came to be placed in the shadow close up to the cornice of the cella within the peristyle. It seems to me this stately procession in such a position, viewed from a short distance, broken up as it is by the columns, appears unending, mysterious, and perhaps was intended to be symbolical of the march of conscious life through all the ages.

Detached works of sculpture are best seen to advantage within or in juxtaposition to a building. Viewed with a natural background of foliage, dissociated from anything architectural, they appear lifeless; but on a background of man's architectural creation they become instinct with life; they are then like jewels of price on the neck of a fair woman, embellishing and embellished. I have referred to our Valhalla, but the Loggia de Lanzi of Florence will be recalled by all as another illustration.

A painted picture is different. It needs, it is true, to be housed, owing to its relatively perishable nature, but for its appreciation as a picture, it demands exclusive attention, to be separated from its surroundings, the vision to be bounded by its frame, and the mind of the beholder to be detached from all else.

It is true that painting sometimes elects the position of handmaid to architecture when it is employed decoratively—it may be in a series of historical records locally appropriate to and fittingly forming part of the architectural monument it embellishes. In this case each picture has some harmony with its fellow pictures and with the sombre neutral hues of the stone. In such case painting becomes broader, more catholic. The same applies to painted windows. They form part of the architectural composition; they enrich and beautify it; their detail is there, inviting careful attention, but like the surface carving on the exterior of a Venetian palace or the walls of a Gothic church, they are primarily the mosaic incrustation giving brilliancy to the whole structure.

Returning to our survey of Gothic architecture, we find that with the downfall of the monastic orders in England, and the Continental upheaval brought about by Luther, with the revolt of the laity against the priesthood, Gothic church building ceased, and closely following on its cessation the army of Craft Freemasons was disbanded, or, rather, dissolved to atoms. The revolt was so complete that Gothic architecture in England was banned as associated with oppression and licentiousness—the virtue and self-abnegation of its artistic founders being forgotten.

Meantime, the revival of the study of Greek literature disclosed to the student, as a new revelation, a people free, untrammelled, heroic, artistic, and god-like, the authors of pure and beautiful architecture, and cultured Europe turned to this fount for inspiration in all its art life.

In Italy, a demand for architectural monuments based on Classic lines found no school of architects at hand trained in the principles of their art, in the sense that the Gothic architects were trained.

The sculptors and painters who were called to design the new Renaissance buildings were not hampered by preconceived theories of design, or, indeed, by technical knowledge of old buildings, and, although they sought to create, they were more anxious to build palaces which they might dedicate than works of architecture. They built, it is true, large buildings, but in few of them is the art a natural outcome of the construction. Many are frankly but backgrounds for painting.

As an illustration, we may cite the Chapel of the Arena at Padua, painted by Giotto. It is a plain, rectangular room having a painted wagon-vaulted ceiling with windows on one side, and not a moulding on the surface of walls or ceiling. As a work of the painter's art, the interior of the building is acknowledged as of the greatest beauty.

The Sistine Chapel at Rome was commenced



1473, finished 1541, and Mr. Fergusson, in order to show the difference between the arts south and north of the Alps, makes a comparison between it and King's College Chapel at Cambridge, built at the same time, 1470-1530.

The Roman Chapel externally was a barn, internally it was almost devoid of architectural mouldings or decoration. It has a barrel-vaulted ceiling, groined over the semicircular-headed windows at the sides. Its walls were covered with paintings by several artists. Its ceiling was painted by Michelangelo, and later the wall over the altar was filled with his great work "The Last Judgment."

The Cambridge Chapel, on the other hand, externally has a rhythmic division and a rich architectural treatment, while internally it is a web of architectural detail, all growing out of and expressing the construction. It has its pictures, but they are transparencies in glass.

The Sistine Chapel has been well and often described by able men, but if it has not already been noted I should venture to make a criticism in regard to its ceiling. This is a plain surface semicircular in section, divided into compartments by painted mouldings. As is well known, the central flat compartments from end to end are occupied with subjects ranging from the Creation to the Deluge, all illustrated with colossal figures. A spectator looking towards the altar sees the figures, it is true, in their proper or intended position, but seen from the altar end they are upside down and grotesque. Now, had all these compartments, instead of being flat, been constructed as shallow domes, either circular or square on plan, no such defect could have been possible, all figures that could be seen from either end or from the sides would have appeared natural in a partially upright position on the concave surfaces, and would not have looked as if they would fall. None could have been seen upside down, and from the art side we should have had the idea that each of the subjects forming the decoration of the dome separately sent up its praise and adoration to the Most High.

In St. Paul's Cathedral Wren had evidently this aspiring idea in mind when he treated his ceilings with shallow domes throughout. In Sir W. Richmond's beautiful decorations of the choir we lose the painful impression of the Sistine Chapel, and do not feel that his figures will fall, while each compartment raises its praise to heaven.

In St. Peter's, at Rome, there are domes in the aisles, but the nave is a long plain vault.

I do not propose to enter here into any comparison between St. Peter's and St. Paul's, except in so far as it relates to my subject, but in that relation I would remark that, if the Sistine Chapel ignores architecture, St. Peter's on the other hand misuses it. At least three designs were made for it, and the conception appears to have eventuated in the idea of obtaining a building with architectural features and details on a colossal scale, but instead of the resulting effect being a beautiful monument, the immense dimensions of which could at once be grasped, the mark has been overshoot. All scale is lost. The Gothic cathedral architects kept their detail—their shafts and mouldings, and even their stones—small, and, judged by the scale of these, their buildings looked very large, while it is stated as a fact that some of the largest are but of the dimensions of an aisle of St. Peter's.

Is it possible that this error arose from the fact that the Glory of God was not the only or main object of the building, but rather the Glory of the Pope, who wished to emphasise the majesty of his power among the nations?

In St. Paul's Wren avoided the error of colossal detail; his internal proportions became in consequence better, and there resulted a vista of imposing dimensions which the mind could grasp. The internal grouping, too, became more graceful; the double order, instead of the single one of St. Peter's, appears to lift up the roof; the domical compartments in the ceiling, to which I have already alluded, added to this effect, and led up to the great transeptal lantern and dome, the whole a conception of aspiring lines leading the eye and the soul ever upwards. Externally in almost every part it appears to be superior in grace of proportion.

Mr. Gilbert, R.A., recently at the R.I.B.A., spoke of Wren's cathedral as the work of a sculptor-architect, by which I think we understood him to mean one who in designing in architecture had the aptitude of the sculptor in proportioning his parts, and modelling the

whole building as it were out of a lump of clay, producing a result graceful and so to speak well poised from all points of view.

In speaking of this modelling of a building, it seems not inappropriate to say a word as to the picturesque in designing. Some few years ago we heard a great deal of this, and it was by some advocated as an end to be attained.

The picturesque in our Royal Courts of Justice is noticeable, but I doubt if it was sought for at all by its author. It was more likely to have arisen out of the natural expression of the constructive planning, and it certainly may be asserted that in most of our old domestic work it will be found to have had its origin in the planning, in additions from time to time to suit varying wants, in the opening up of prospects, or in other natural ways. Unless it has such a natural basis it is incongruous. To distort an interior or exterior in order to get a picturesque effect is inadmissible.

Symmetry in a design, especially of a public building, is an element of great art value. Externally it contributes to the ideas of dignity and repose, and to that impressiveness due to simplicity. Internally a symmetrical plan is easy to follow, and the appreciation of the building is much enhanced if there is no irritation created in preoccupied minds by difficulty in finding one's way about. Mr. Aston Webb, at the Architectural Association, recently spoke ably on this subject. But symmetry does not mean cast-iron uniformity, or that everything is designed and set out with geometrical precision. The contrary is the case. The general effect is "ordered," so to speak; but Ruskin notes the variations in the width of piers and arches in the façades of numerous buildings which to the casual inartistic observer appear rigidly symmetrical. I will cite but the example of the Car d'Oro Palace at Venice, where there is a battlement or cresting of varying height along the front. In the happiest way the architect has given the effect of symmetry, but on analysis it will be found that the effect is produced by an unsymmetrical outline. This is but one of the æsthetic refinements of architecture where the idea is expressed without demonstration.

In like manner, as I have endeavoured to show in the earlier part of this paper, proportion is not the result of following ingenious scales of modules framed on classic examples, nor of triangles based on Gothic structures, but should be the æsthetic expression of the ability of the various parts of a structure to perform the duty imposed on them, the lower parts being necessarily more massive than the upper. It was probably a recognition of this which led Vitruvius to lay down a law that in superimposed orders, the Tuscan or Roman Doric should be at the bottom, the Ionic next, and the Corinthian above that, because the first was the most massive, the last the lightest. But this arrangement gives us a cornice to the lowest story larger and heavier than to the highest, whereas the function of a cornice to a roofed building is to throw the rain off the building, and to do this the cornice at the eaves should be larger, with more projection than any other horizontal feature of the façade, and æsthetically this arrangement is, as a rule, by far the best. Proportion must, in any living architecture, vary with the material used and with the size of the building.

The single order of the Elevation of St. Peter's at Rome may be correct by scale, but it is unreasonable in its actual position. Again we do not quarrel with the proportion of an iron column or stanchion at the Crystal Palace. It is seen to be appropriate to the material. The Eiffel Tower was formally protested against before its erection by a large number of eminent artists in France and elsewhere, but when erected, these same artists recanted their former condemnation, admitting its grace and proportion, these being evolved from the perfect expression of the functions of the material employed.

The fact is, we should concern ourselves less with the proportion of any detailed feature in a composition than with that of the broader groupings of the whole structure. Detail is interesting and important, and should be sedulously studied when we come to it, but it is not the be all and end all. That which is seen of any monumental architectural work is the mass.

Mr. Walter Crane says that a people without art are, collectively speaking, inarticulate. In other words, if I may venture to interpret him,

they may be scientific; they may, like Faust, sound the depths of knowledge, or, like Newton, soar to map the heavens; but unless they have minds to achieve and create, and the faculty to appreciate emotions and ideas, they are soulless—are of this earth and not a part of the immortal. Mr. Crane adds that the most vital art is the expression of character. If that be so, and if the noblest and most enduring quality of a race is character, then architecture, among the arts, is the noblest and most enduring—that which expresses the virility of a nation.

The formation of this quality of character is closely allied to religion. I cannot here enter into the philosophy of this alliance; but, accepting religion as a great agent, there can be no question that art is a potent influence in the teaching of religion. Science deals with demonstrable truth; art, with imagination. Science tells us—very often on insufficient data, and, therefore, erroneously tells us—what is; and often will not admit anything to be which it cannot demonstrate. Art tells us that to live is the effort to be what life as defined by science is not; that if science makes anatomical sections of a man, maps his every nerve, and plans the channels of his life's stream, she has not found, and cannot find the man, the living soul which art is ever disclosing in new forms. And as religion is the great exponent of the same message, she naturally draws to her this potent ally. From the earliest days it has been so, and hand in hand they have worked together. Architecture has raised the temple expressing the ideas which her co-workers expound.

Among the arts there need be no rivalry. Architecture can mould itself in sympathy with the sculptor, and can adapt itself to the exigencies of the painter. The more massive art can accommodate herself to the less robust arts and make provision for their display to the best advantage. So let it be.

What then are the practical conclusions to draw from our consideration of this most interesting subject. They are that the possibilities of our art are great, that the responsibilities of its exponents are greater. We have cause for much rejoicing that this wonderful century is closing with bright prospects for architecture. It is more zealously and lovingly studied and expounded. Its spirit is more appreciated, not only by its ministers, but by a growing number of the public. This should rouse our enthusiasm, but although enthusiasm is good, let it not carry us away to false ideals. Avoid the cant which suggests that it is beneath an artist architect's dignity to pursue the humbler details of his studies, the scientific basis for his perfected work. Enthusiasm should spur us to labour and to study. In itself it will attain nothing. Enthusiasm for music, and a nervous horror of discord, will not enable us to compose or to perform music, nor will a similar emotion make us architects.

For us to carry the banner of our art still upward and onward needs a power to apprehend current needs, logical reasoning, much labour, courage, and technical study, as well as the environment of art works, of liberal thoughts, high ideals and aspirations, and sympathy. We must throw off the shackles of past civilisations, not ignoring but assimilating all that they can teach us, and steadily seek to create and express what is best and brightest for our own time.

In this way the position of architecture among the arts will be a high and noble one, and with its sisters, sculpture and painting, it will beautify and ennoble the people's life, and so reverse the oft-repeated but we would fain hope untrue dictum that art flourishes best in the decadence of a nation.

Our report of the interesting discussion which followed will appear in our next issue.

ART GALLERY, WHITECHAPEL.—The foundation-stone of the Whitechapel Art Gallery was laid on the 9th inst. in the High-street. Work has been proceeding on the building for some time. The architect of the Art Gallery is Mr. C. Harrison Townsend, whose design was illustrated in the *Builder* for May 30, 1896. The accommodation internally will be sufficient to hang about 450 pictures. The plans provide for two galleries, one on the ground, the other on the first floor. The ground floor will be a nave like a hall with aisles, and lighted from the side. It will be 100 ft. long, and 48 ft. wide. The upper hall will be 120 ft. long by 26 ft. wide, and will be top-lighted. There will be, besides these, an annex on the ground floor. Mosaic is largely used in the exterior.



## THE INSTITUTION OF CIVIL ENGINEERS

At the ordinary meeting of his Institution on the 6th inst., Mr. W. H. Preece, C.B., F.R.S., President, in the chair, the paper read was on "The Ventilation of Tunnels and Buildings," by Mr. Francis Fox, M.Inst.C.E.

In regard to the first part of the subject, the author enunciated the proposition that if the amount of carbon dioxide in the air of a railway tunnel did not exceed 20 parts in 10,000, then the ventilation might be deemed satisfactory. On this basis, and allowing 29 cubic feet of poisonous gas for each pound of coal consumed in a locomotive, the number of pounds of fuel consumed per mile, multiplied by 29, multiplied by 500, and divided by the number of minutes interval between the trains, would give the volume of air which must be introduced into the tunnel per minute. The ventilation of the Severn and Mersey tunnels had been determined by this rule, and had been referred to as satisfactory in the report of the Departmental Committee of the Board of Trade on the ventilation of the Metropolitan Railway Tunnels, 1897. In regard to the Mersey Tunnel, it was, however, to be regretted that, owing to the poverty of the company, inferior coal was being used, and the fans were run at a lower speed than was intended. Even with these drawbacks, however, the purity of the air in the Mersey Tunnel was well within the limits proposed by the author. The case of the Metropolitan Railway tunnels, having been the result of recent investigation, was not mentioned otherwise than to recall the fact that the amount of carbon dioxide in the air had been shown to be as much as 86 parts per 10,000. The great Alpine tunnels were next referred to. In the case of that under Mont Cenis, 8½ miles long and 26 ft. wide, the higher altitude of the middle of the tunnel above its entrances was inimical to good ventilation, and at times great difficulty was experienced in carrying on the traffic. The antiquated system at present employed was merely palliative, consisting in the injection of only 70 cubic metres per minute of air compressed to 75 lb. per square inch, discharged at points 1 kilometre apart throughout the tunnel. Owing to the bad ventilation, not only were the men working in the tunnel subjected to great discomfort, but the corrosion of the rails was excessive, about 300 tons having to be relaid every year. The St. Gothard Tunnel, 9½ miles in length and 26 ft. wide, was nearly level from end to end, and, until recently, natural ventilation only sufficed; but, owing to increase of the traffic and the use of briquette fuel, the Saccardo system had lately been introduced. This consisted in blowing into the mouth of the tunnel a large volume of air which, on the principle of the injector, caused an induced current in the annular space between the interior surface of the tunnel and the system of maximum construction. This system had been adopted with success in the case of the Prachia Tunnel on the main line between Florence and Bologna, the state of which was recently dangerous to human life. Experiments made by the author in this tunnel showed the following results. Before starting the fan the tunnel was filled with a dense volume of smoke from end to end, the temperature being 107 deg. F., with 97 deg. of moisture, or nearly complete saturation. With the fan running the thermometer indicated 80 deg. F. (the temperature of the external air) and the moisture was normal. The volume of air injected by the fan was 164,000 cubic feet per minute, and that by the induced current 46,000 cubic feet, making a total of 210,000 cubic feet of air per minute passing through the tunnel. It was not improbable that the Saccardo system would be selected for the ventilation of the two parallel tunnels 12½ miles long, now being constructed under the Simplon.

In the second part of the paper the author animadverted on the inconsistency of keeping houses clean, streets swept, and sewers flushed with the object of preserving the air in a pure condition while allowing it to become absolutely foul and putrid for want of proper ventilation. Air passed through human lungs had been well designated "air-sewage." It was highly poisonous, and the breathing of it over and over again was fraught with the gravest consequences to health. It had been asserted by Dr. Ransome, F.R.S., that 70,000 deaths occurred annually in Great Britain from tuberculous disease, nearly all of which could be saved

were the subject of fresh air both understood and acted upon by the community. Competent medical authority considered that the quantity of carbon dioxide in the air of rooms should not exceed ten parts per 10,000, equivalent to about 16 cubic feet per head per minute. In French hospitals 50 cubic feet per patient per minute was allowed. The author considered that 20 cubic feet per minute would be sufficient for ordinary purposes. Tables were given of the impurity in the air of schools, with different systems of ventilation, of that in dwelling-houses, and of that in sewers; from which it appeared that the latter was the least impure of the three. Proceeding to consider the ventilation of particular public buildings, the author illustrated his views by reference to special cases which had come within his experience. The fact should not be lost sight of that the air in a room might be quite cold and yet very foul; whilst on the other hand it might be warm and yet perfectly fresh. To avoid draught, the air should enter through a large number of small orifices so as to thoroughly diffuse the current. This was done by gratings, but unfortunately these seriously diminished the volume of air passing through, owing to the friction of the bars. The same remark applied to extracting flues. The author was of opinion that no large building could be successfully ventilated without some mechanical force furnished by steam, electricity, falling water, or other such agency. Then, fans could be worked with certain results, whereas automatic extractors not infrequently become inlets, thus reversing the whole system. The inlets should be by Tobin or similar tubes, about 5 ft. above the floor. In one American State Legislation building, the warmed fresh air entered on the level and in front of the desks of each member. In conclusion, the author urged the desirability of educating the public to the value and merits of fresh air.

At this meeting it was announced that twenty-six Associate Members had been transferred to the class of Members, and that 125 candidates had been admitted as students. The first ballot of the session resulted in the election of fifteen Members, seventy-two Associate Members, and six Associates.

## ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting, on the 7th inst., Sir Henry Howarth, President, in the chair, Mr. C. J. Praetorius exhibited a bronze horn (now in the collection of Canon Greenwell) which was found in the Drimoleague mountains, co. Cork, and possessing the following points of interest. The horn was made by casting in two pieces, the joints being still visible. Near the mouth hole, which is situated at the side, firmly fixed in the bronze, is an iron nail, and near this a roughly scratched design. There are also certain rivet holes, the use of which has not been as yet explained. Mr. R. Garraway Rice exhibited two cast bell-metal mortars of seventeenth century date, bought in Sussex; one ornamented with four sprigs, each consisting of two leaves and a flower of six petals executed in a rough, conventional manner, which design had evidently been produced by impressing a stamp on the mould; the decoration of the other example had been done in a similar manner, the design consisting of an heraldic wreath, upon it a buck's head erased, the whole within an oval. This stamp, like that in the first example, was repeated four times. Another mortar of similar character, in the possession of the exhibitor, but with handles, is ornamented with the same stamp, which would suggest that the crest was not personal to the original owner of the mortar, and that the stamp was in common use by the founder as a means of enrichment. Mr. Rice also exhibited an oval-shaped dish of beaten copper, possibly of seventeenth century date, dug up near Morden, Surrey, about the year 1868. Mr. Charles Seidler contributed a paper on Ancient Enamelled Crossiers dating approximately from the end of the twelfth to the first half of the fourteenth centuries, made of copper and ornamented by the champlevé enamel process commonly known as Limoges work. Up to the end of the thirteenth century the artist enamellers were monks and the product of their labour was dedicated to the service of the church. At the beginning of the fourteenth century, the art quitted the Cloisters and spread abroad. It is not recorded that any of these crossiers were discovered elsewhere than in France, Germany, Austria, Italy, Spain,

England or Ireland. Mr. Seidler exhibited, in illustration of his paper, an album containing photographs and drawings of 170 crossiers. By permission of the authorities, Viscount Dillon exhibited some gauntlets from the Tower of London. Among them were two locking gauntlets, incorrectly called "forbidden gauntlets" and used exclusively for the tourney with blunt swords and maces; also a very rare example of a gauntlet for use at Barriers, with flanges to prevent the opponent's spear point passing between the hand and the spear. Another gauntlet of Charles I., when Prince, had a small pin on the knuckles to protect the hand from being jammed in the vamplate. A gauntlet of the so-called Essex suit was also shown in which the cuff piece suddenly became contracted so as to prevent the cannon of the vambrace pushing the gauntlet off the hand.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The third meeting of the session was held at the rooms in Sackville-street on the 7th inst. Mr. Blashill, Hon. Treasurer, in the chair. Mr. Bodger, of Peterborough, exhibited a silver penny of Offa, recently dug up in Castor Churchyard; also a styca of Canred, King of Northumbria, A.D. 868-878. He likewise exhibited some portions of tiles of elaborate pattern, with the Tudor rose, recently discovered in pulling down the Angel Hotel, Peterborough. Mr. Irvine sent for exhibition careful drawings of the leaden chalice preserved in the Chapter Library at Peterborough, and some measured drawings of the coffin lid or tombstone lately found in excavating under the diagonal buttress of the "new work" at the cathedral. A series of twenty very beautiful sepia drawings of antiquities in Boston and the neighbourhood, executed by William Brand in 1868, were also exhibited by Mr. Bodger. Mrs. Day showed some rare examples of early printed books, including a real Aldine Cicero, dated 1502. Mrs. Collier laid upon the table an interesting bronze medallion of Oliver Cromwell, and other Cromwellian memorials. The Rev. H. J. D. Astley, Honorary Editorial Secretary, exhibited on behalf of Mr. Donnelly some further graphic sketches of various objects found in the Cranmore, recently discovered near Dumbarton, showing the construction of the wet dock for the great war canoe, and the weird looking objects called totems, carved out of canal coal, &c. A paper entitled "The Ancient University of Britain" was read by the author, the Rev. W. S. Lach-Szyrna, M.A. He said the question, Which is the oldest university of Britain? is one of considerable interest. Modern criticism tends to cast doubt upon the long-accepted theory that Oxford is the oldest because it derives its origin from the age of Alfred the Great, while many Cambridge men claim that their University is the elder of the two. With that question the paper was not concerned, but with a far older institution than either of them, for even before the birth of Alfred the Great there was in Britain a university some 400 years old, which, in the time of Alfred, after a long period of usefulness, and being a centre of light to Celtic Britains, had already passed its acme, and, from political causes, was verging to decay. This was the University of Llanilid, Fawr, or Llanilid Major, as it is now called. This university was founded in the age of Theodosius II. It was burnt by Irish pirates in 440, but was restored and rebuilt by St. Ildy. For the archaeologist, Llanilid at the present day presents one of the most striking groups of British monuments—a museum, as it were, of edifices or monuments *in situ*, including a wonderful pagan British altar pillar, carved over with Celtic ornament, and with grooves for the sacrificial blood, the mention of St. Gsamson, the ancient crosses, and, in the churchyard, the pillar reared by King Howell in the ninth century, together with monastic ruins and foundations of college buildings, all grouped around the church and churchyard.

LAUNDRY, BLACKBURN WORKHOUSE.—Alderman Hoyle, J.P., opened on the 7th inst. the new laundry at the workhouse, which has recently been added to the institution at a cost of 2,519l. The building, which is of brick, faced with white stone, consists of a receiving-room, leading into a washhouse 50 ft. by 24 ft. The adjoining ironing and drying room is 50 ft. by 30 ft. A delivery room 30 ft. by 18 ft. completes the building. The machinery is driven by steam. The architect is Mr. James Aspinall, and the contractors are R. Webster, masonry and brickwork; J. Highton & Sons, joinery; P. Walsh, plumbing; Foster & Sons, Padiham, slating; and Dickenson, painting.



## Illustrations.

## THE PONTE VECCHIO. FLORENCE.

AS so much is being said at present in regard to the threatened demolition of old buildings at Florence, and of the Ponte Vecchio itself, it will be of interest to give the picturesque sketch of the old bridge made by Mr. J. Staines Babb, which shows very carefully the characteristic features of the structure.

In regard to the threat of its destruction, we observe that in a letter published in the *Times* of Thursday, from the Marchese Torrigiano, he denies that there is or was any intention to pull down or rebuild the Ponte Vecchio; and we may hope that this is true for the present, though we never know how far to trust official promises of this kind.

Mr. Babb, in the communication accompanying his sketch, has assumed that the Ponte Vecchio will probably be removed as a matter of necessity, and has made some suggestions as to the manner in which it should be replaced; and although these assumptions may be premature, Mr. Babb's remarks are of interest as those of a painter who is interested in architecture, and we therefore print them as sent.

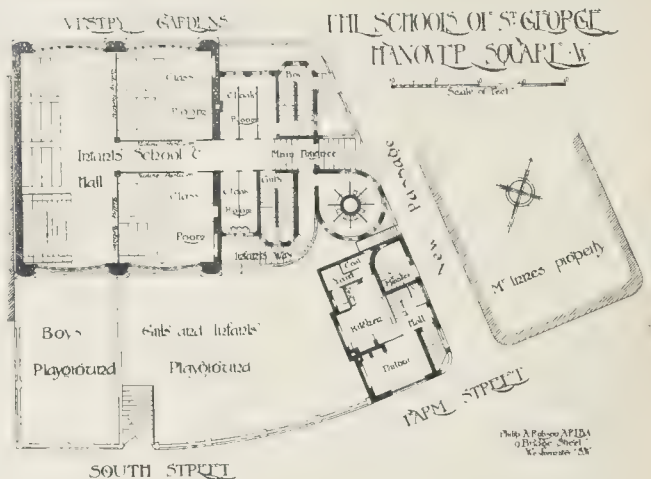
This reproduction of a traced memorandum from a water-colour drawing made by me in February, 1887, of the Ponte Vecchio, Florence, shows the main structure, with the picture gallery to the Pitti Palace, above the shops; the arched openings near the centre on the foot-way level; and the outgrowth of extra rooms hung up, and propped by bright red strut-poles above the Arno. It is offered here to show at a glance the nature of this picturesque bridge and its accidents of development, ere possible changes sweep them away.

The original drawing was made on the spot beneath the return arcade by the Uffizi; and the view of the right-hand end of the bridge was obtained by my leaning to the outer edge of the embrasure. I felt that serious alterations might be imminent, as the repairs were about to begin. The putlog holes for the scaffolding may have been temporary, but produced a very agreeable effect. Incidental to the conjecture of its probable destruction, I thought that if the demolition of the bridge were decided on, as *absolutely necessary*, by architects of practical experience and taste, because repairs sufficient for safety, and convenience of traffic had become impossible (this dictum being regretfully accepted by us artists as a duty); the next care should be that full, measured architectural drawings (plans, sections, &c., and details with any decorations shown to a larger scale), be prepared of the whole thing as it exists, no accident of development, good or bad, being omitted; for it is a matter of history, and the drawings should be attested records in respect of their veracity. The question which naturally follows this concerns the character of the new design. And here one can only feel that the best compliment a city can pay to those artists who have produced the work we admire, but cannot any longer preserve—is to adopt the leading lines of their design and treatment, set forth afresh, in conveniently expanded dimensions for traffic and health; a glorified version, we may suppose, to delight us; as the physical excellences of a man reappear more beautiful in his healthier and happier offspring. The central feature of Florence is an integral part of her romantic history, and should be recalled in suggestion by the new bridge. Economy would be unworthy where economy must dishonour the traditions of the city's highest art. Money, in this age of mighty fortunes, could hardly be wanting, when the generosity of merchant princes all the world over had been stirred by knowledge of the facts. Surely the liberal hand and warm heart are not lacking in modern days; perhaps only a little of that loving reverence for old work well done, best shown by seeing if we can do better and more carefully.

"Les chefs-d'œuvre ne sont jamais que des tentatives heureuses; console-toi de ne pas faire de chefs-d'œuvre, pourvu que tu fasses des tentatives consciencieuses," says Georges Sand, in "*François le Champ*," which may be wholesomely capped by Life's whole lesson to cities and individuals, that

"Men may rise on stepping-stones  
Of their dead selves to higher things."

One can conceive a marble bridge with an



arcade and galleries above, extending the whole length of its broad footways on each side, with a roadway between these, open to the sky; the broad, plain exterior wall band made a more characteristic feature beneath the picture-gallery windows (if this were not lighted from roof above), and a vigorous external entablature carried across; treated as a deep frieze of delicate sculpture, based on the purest Greek models; the piers, wherever placed below, massive and simple if possible, forming bases to support groups of well-balanced and dignified figures in the round; a worthy object for that Italian skill and perception which never dies, and may, any day, again make the world the better by the outbreak of the hidden fire of its genius.

J. S. B.

## DINING-ROOM AT THE PALACE, DARMSTADT.

This is a design for decorating a dining-room for the Grand Duke of Hesse's Palace at Darmstadt, by Mr. M. H. Baillie Scott, and which was exhibited at the last Royal Academy.

We have no information from the architect in regard to the work.

## WEST END OF A TOWN CHURCH.

In this study it is assumed that the site is an isolated one, at the junction of two streets. The nave towards the west terminates in a tower, and it is the west elevation of this which forms the subject of the illustration. The nave, choir, and transepts would be of a considerably lower level. Inside narrow side aisles are adopted, with galleries over, the outer wall of aisles being carried the whole height of nave.

S. K. GREENSLADE.

## A STREET FRONT.

This is a study for a new front to an old building. Entrances for the shop and private house are placed either side of the show window, which is segmental on plan and recessed behind columns. This would give would-be customers an opportunity for inspecting goods without being hustled by passing crowds on the pavement.

S. K. GREENSLADE.

## ST. GEORGE'S, HANOVER-SQUARE, HIGHER GRADE SCHOOLS.

THESE schools, situated in South-street, Grosvenor-square, W., were united with the Steuart Schools, and this year they have been rebuilt and reorganised. In 1896 a limited competition was held, and Mr. Macvicar Anderson, the assessor, placed first the plans prepared by Mr. Philip A. Robson. Owing to certain revised requirements on the part of the Duke of Westminster, who has given a considerable sum in addition to the site, these plans were not carried out, and the new scheme was designed which is here illustrated.

The plan is unique owing to peculiarities in the site, due to an amalgamation of the old and new sites, and certain concessions to improve the public ways, and cannot be elsewhere applicable. In plan and design the architect's endeavour has been not merely to convey the impression of a school building, but that of a higher grade church school.

The playgrounds are sunk and extend beneath the main building, and from the girls' playground the cookery school is approached under the teachers' houses. The principal floor is arranged for 240 infants, and the teaching rooms can easily be converted into a hall. The first floor will accommodate 180 girls, and the schoolrooms can in this case be treated as two class-rooms if desired. The second floor for boys is similar. The third floor is arranged for technical teaching. The mezzanines are utilised for teachers' rooms, committee room, book stores, general stores, &c. The sanitary tower forms an unusual feature, and is well isolated. The master's house is placed above that of the mistress, and is entirely separate from it, two floors being allotted to each. The master also obtains a way to the boys' floor across the latrines' tower.

The builders are Messrs. Dove Brothers, Islington. The fireproof flooring throughout is by Mr. C. G. Picking, Southgate, and the wood-block flooring by the Acme Flooring Company. The N. A. P. Company's windows have been used, and a special design of the architect's carried out. The sanitary work throughout is by Messrs. Adams & Co., Westminster. Messrs. Peace & Norquoy's patent swivel partitions are in use on the infants' floor. The heating is mainly by "Sunbeam" radiators (Messrs. Longden & Co.), though some "Well-fires" (Bowes' Patent) are provided in addition, and the Educational Supply Association are furnishing.

In the houses Messrs. Waygood's supply a lift, and the ranges, grates, &c., are by the Falkirk Iron Co. The hot-water supplies are by Messrs. Cannon & Sons. The door furniture in both schools and houses is supplied by Messrs. Chas. Smith & Son. The buildings are fitted throughout on Middleton's Patent Conduit System. The external walling is of a rich red brick, Portland stone, and brown glazed brick, and the roofs are covered with two colours of Broseley tiles. The cost of the buildings and furnishing is from fifteen to sixteen thousand pounds. There being no clerk of the works, Mr. Ford, the foreman, has had a responsible duty, which he well executed.

PHILIP A. ROBSON.

## BRIGHTON, HOVE, AND SUSSEX THROAT AND EAR HOSPITAL.

THIS hospital, the first portion of which has just been erected, was opened by his Grace the Duke of Norfolk on the 29th ult. The building is from the designs of Mr. Cavthorn, architect, of Brighton, and the exterior is treated with red brick and terra-cotta. The site is upon the slope of a steep hill at the upper part of Church-

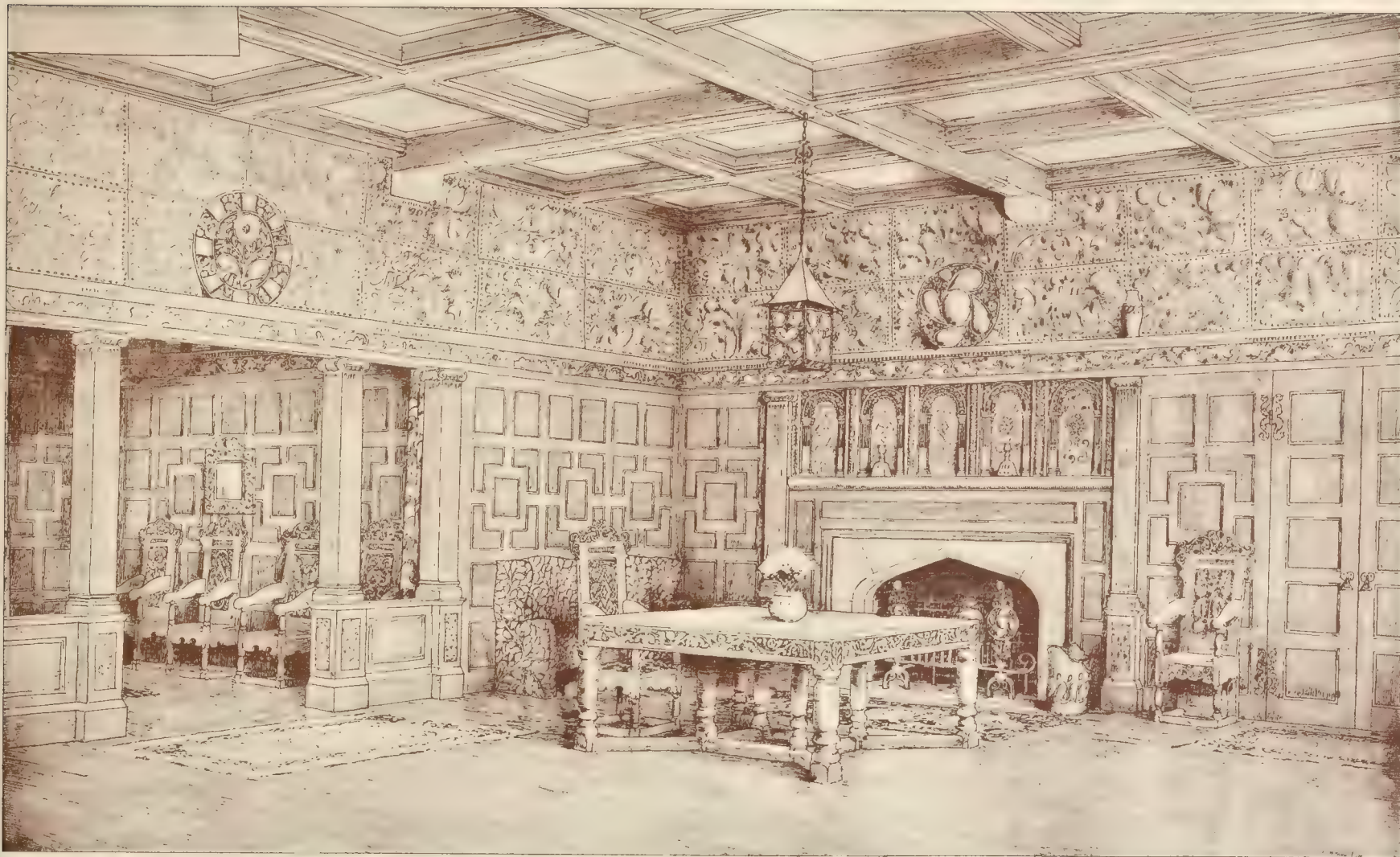




Ponte Vecchio -  
- J. Stames Doll - Firenze - 1887. -





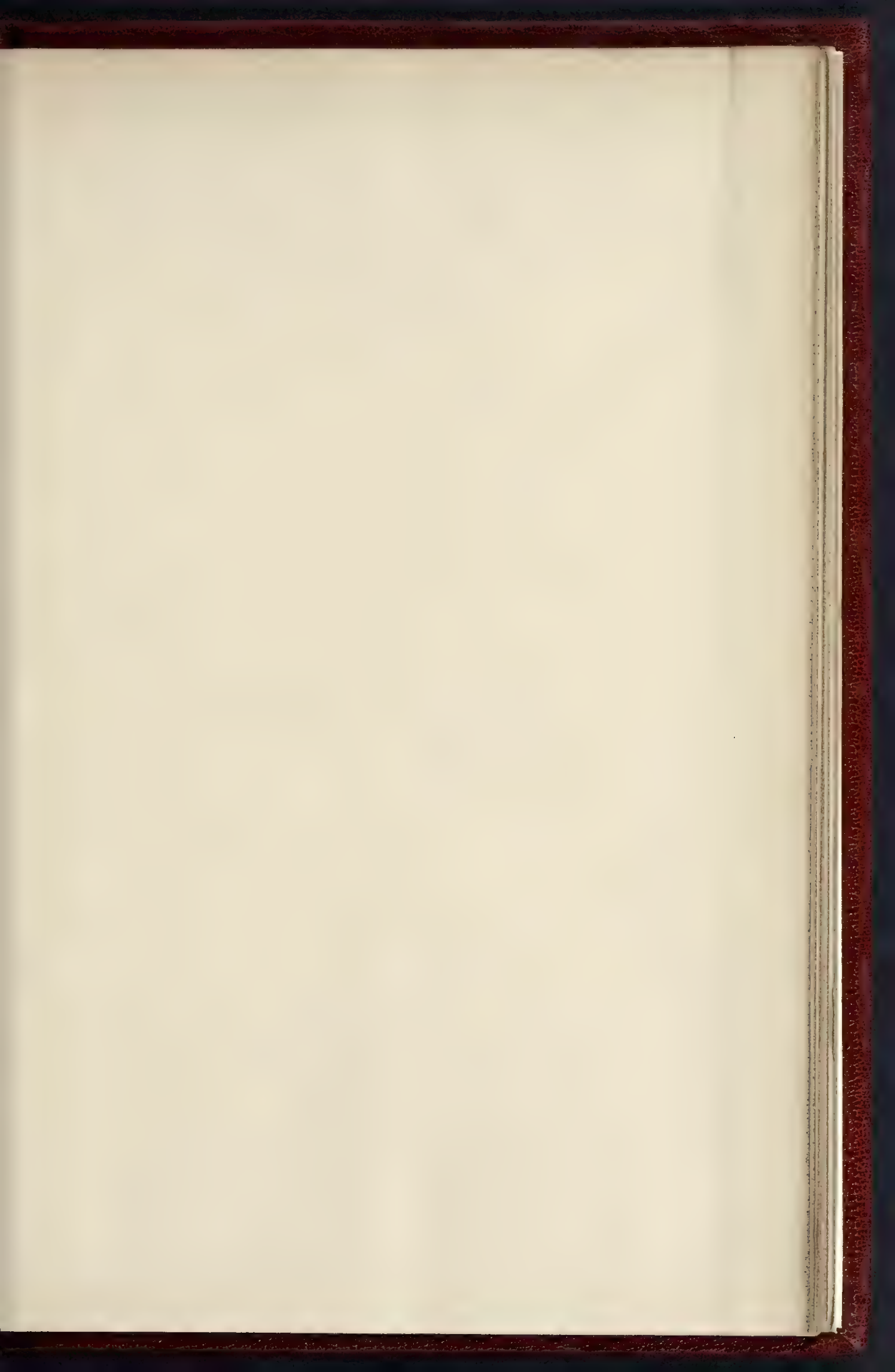


W. B. SPRAGUE ARCHT. 11 & 13 EAST HARDING STREET, NEW YORK

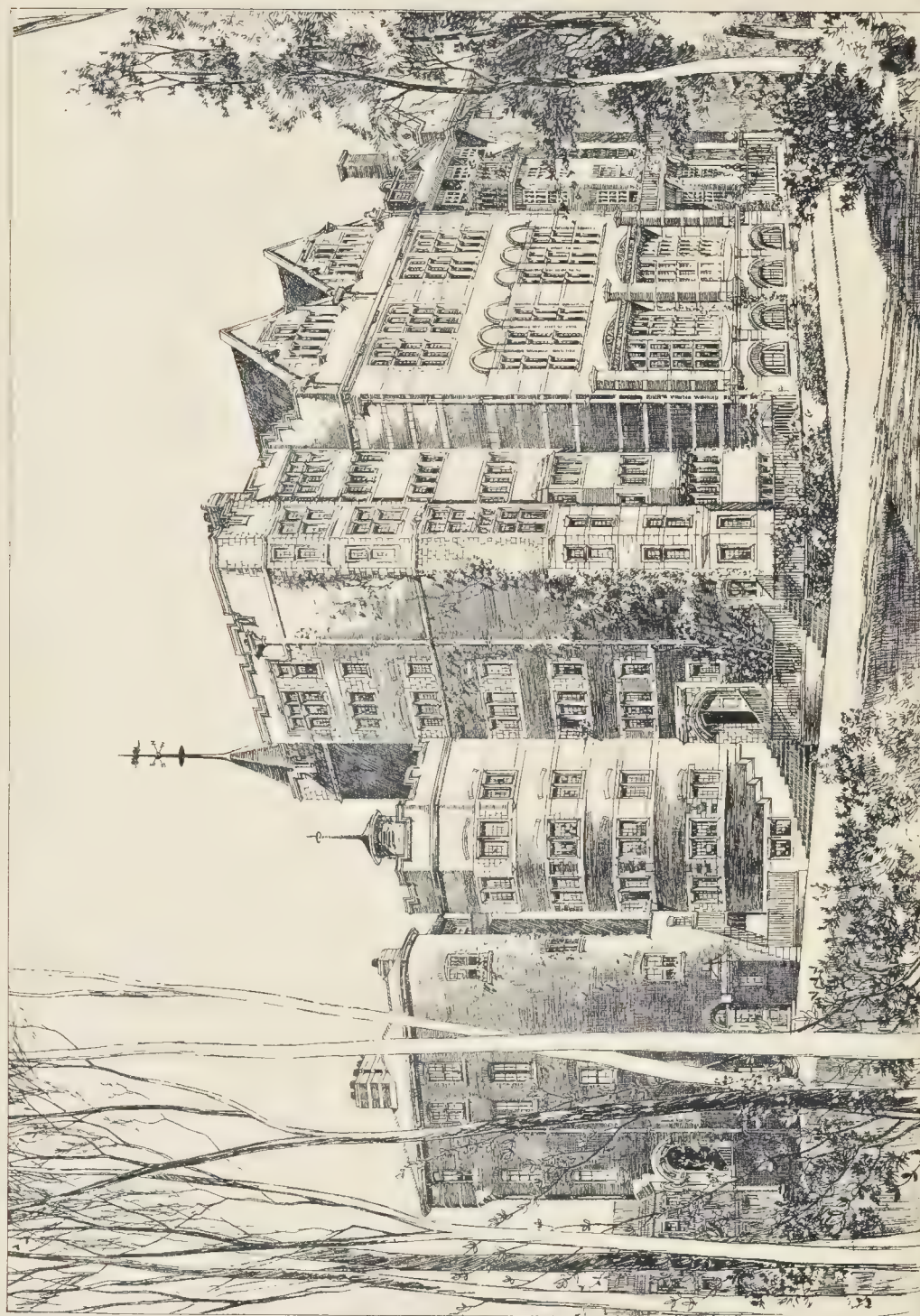
DINING ROOM AT THE PALACE, DARMSTADT, FOR H.R.H. THE GRAND DUKE OF HESSE—MR. M. H. BAILLIE SCOTT, ARCHITECT.



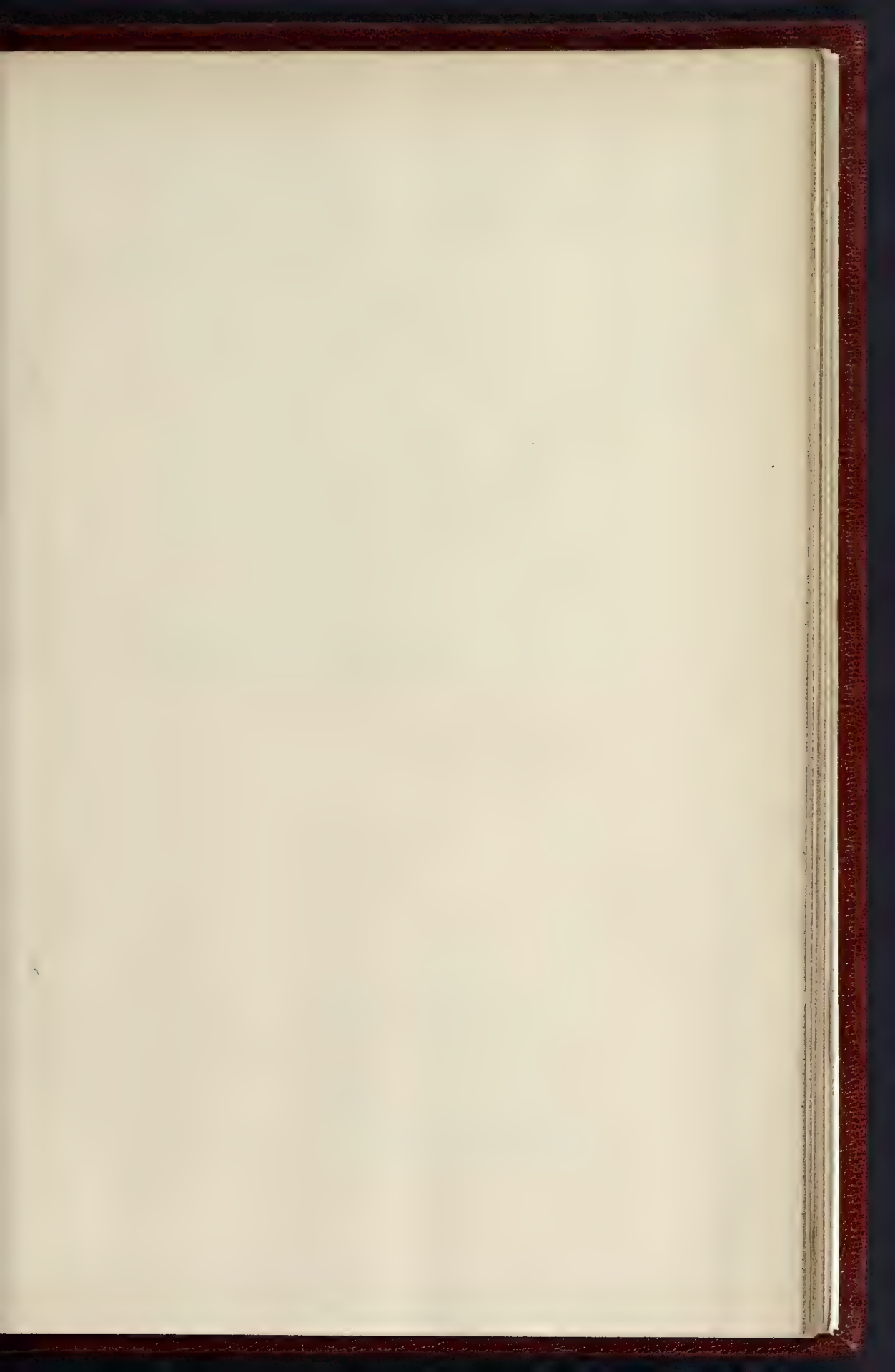




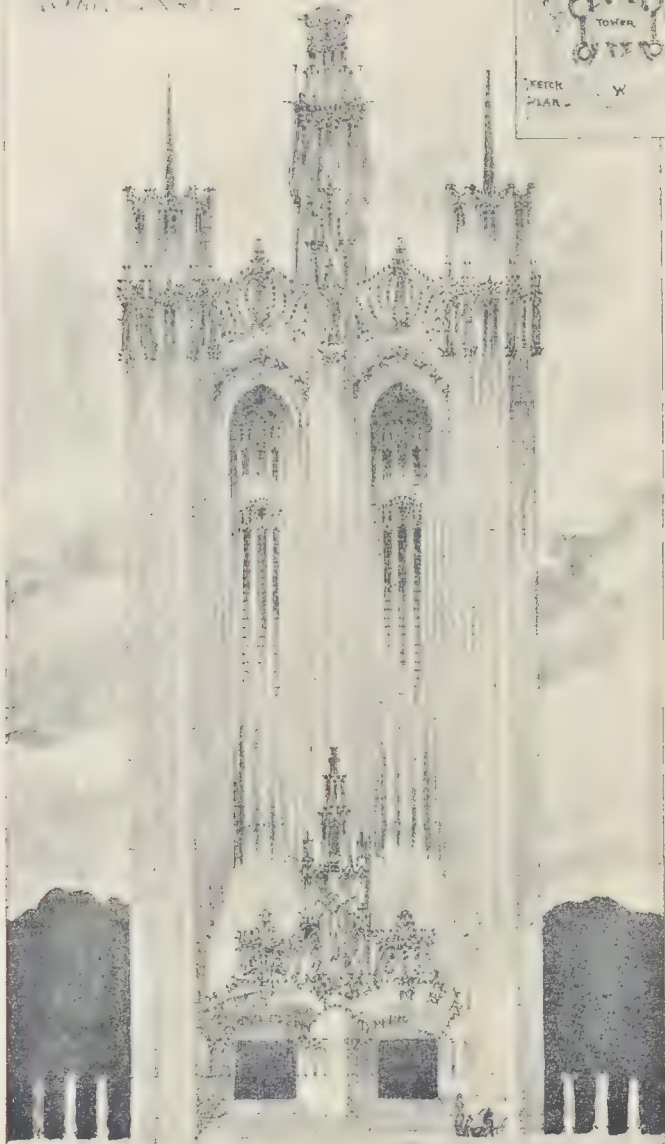
THE BUILDER, DECEMBER 17, 1898







ST. MARK'S CHURCH  
WEST ELEVATION  
WINDMILL



WEST ELEVATION

NOTE

THIS END FORMS A TOWER WITH CENTRAL  
FLECHS - THE HAVE, CROOK AND TRANSEPTS  
BRING AT A LOWER LEVEL - SEE PLAN

SIGNEY K. GREENSLADE  
ARCHITECT.











PHOTO: THE SPHAGNUS & CO. 47 & 49 EAST HARGREAVE STREET, LONDON E.C. 2.

THROAT AND EAR HOSPITAL, BRIGHTON - MESSRS SCOTT & CAWTHORN, ARCHITECTS





street, Brighton, and the building consists of five floors. The basement contains the kitchen and service portions, the ground floor, the outpatient department. At present the hall is used by these patients as a waiting-room, and there is a consulting-room, syringing-room, minor operation-room, and dispensary provided for the O.P.s. The first floor has a male ward for eight beds, and the operation theatre is on this floor, the walls being tiled and the floor of marble Terrazo paving. The female ward for eight beds is on the next floor, and there are several detached rooms to be used as separate wards, as well as nurses' rooms, &c., on each floor. The top floor receives the servants and night nurses.

THE SURVEYORS' INSTITUTION:

THE LONDON BUILDING ACT AND THE OFFICE  
SUPERVISION OF BUILDINGS.

AN ordinary general meeting of the Surveyors' Institution was held on Monday at the temporary premises of the Institution, Savoy-street, Victoria Embankment, W.C., Mr. Robert Vigers, President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. W. Weaver said a paper entitled "The London Building Act and the Official Supervision of Buildings." He was desirous, he said, of drawing attention to the London Building Act, and the manner in which it is carried out and enforced, with the view of considering the desirability of extending to London the system prevailing under the Public Health Act in the provincial towns throughout England. Recent unfortunate events in London had had the effect of directing public attention to the Building Act and the alleged shortcomings. They were aware of the many alterations made in the Bill form of the Act and the very different consideration given to it and the very different manner in which it presents in the form of an amendment might be fairly assumed that even if the same amendments were given to the amendment of the present Act, the resulting measure would still fall short of perfection, and afford ample opportunity for the exercise of legal acumen and expert skill in the interpretation of its provisions. He was of opinion that the remedy for the defects of the present official system of building supervision in the Metropolis must be sought, not so much in the direction of amendments to the Act itself as in the system of supervision adopted in enforcing it. During this thirty-nine years' official connexion with this parish, Kensington had developed from a small field and garden into one of the most important districts of the Metropolis, and very exceptional opportunities had been afforded of acquiring practical acquaintance with the subject under consideration, not only in the particular district referred to, but in the Metropolis generally. In the report of the London County Council for 1897, it was set forth that for the purposes of the Building Act the county of London was divided into sixty-four districts, each superintended by a District Surveyor, whose duty it was to see that all new buildings and all alterations and additions to buildings "are carried out in accordance with the law." This statement was not correct, for the District Surveyors exercised no supervision over the building of houses, and the appointment of the District Surveyors was governed by the report of the Council. He further stated that the standing order of the Council requires each District Surveyor to be appointed for a year, and that he should devote the whole of his time to the duties of his office, and not to engage directly or indirectly in private practice. Of the existing District Surveyors, forty-one could take private practice, twelve were precluded from private practice in their own districts, and the remaining eleven were, under the standing order above referred to, entirely precluded from private practice. The District Surveyors were remunerated by fees in accordance with schedules attached to the Building Act, and during the year covered by the Council's last report these fees amounted to the sum of £77,488. 2s. 4d. The Council had power, under Section 138 of the Act, to substitute a fixed salary in lieu of fees, abolishing the system of charging the salary out of the County Fund. Prior to the passing of the order prohibiting private practice, the office of District Surveyor was sought, not so much for the direct income attaching to it, but for the opportunities afforded for enlarging the private practice of the official. A District Surveyor

acting as architect for a building in his own district was required to give notice of the fact to the London County Council, who appointed the London Surveyor, generally from an adjoining district, to see that the building was erected in conformity with the provisions of the Building Act. After a short interval the positions were possibly reversed, and the first-mentioned District Surveyor found himself officially supervising the work of the *pro te* District Surveyor in his district. There could be no doubt that it was bad in principle for any public official to be allowed to engage in private practice in any way connected with his official work, and doubtless the London County Council acted wisely when they passed their resolution prohibiting district surveyors thereafter from being appointed to engage in private practice. It was somewhat curious, however, to observe how this restriction actually worked. When a new district surveyor was required, candidates for the position were invited to advertise, and in response applications and testimonials were sent in to the Council. Each candidate must have passed the qualifying Royal Institute of British Architects' examination; but beyond that equal gauge, the comparative merits of the candidates were assessed upon the skill and ability they had shown in the past exercise of their profession, and, in the result, an architect was appointed who had established some reputation for designing and planning buildings; and the situation did appear somewhat ironical when it was considered that the newly-appointed surveyor must no longer exercise the talents which had secured him the appointment. The man who had gained a name for designing good elevation and getting out a clever plan was forthwith to stifle his own aspirations and inspirations, and be content with looking after the height and thickness of walls, &c., and other dry provisions of the Building Act. It was to be presumed that such self-sacrifice was joyfully acquiesced in, but this castration of professional ability was for some reasons to be deplored. The training necessary for the production of a good architect was not required for and should be different from that of a building surveyor, in whose case the skill to plan and design, with no less a necessity in the architect, was so much required, and a thorough acquaintance with building materials, the knowledge of strains and thrusts and of workmanship was much more desirable than expertness in the more artistic branches of the architect's profession.

In 1885, in response to an order of his board, he presented a report embodying suggestions for improving the local public work of the Metropolis.<sup>5</sup> Most of these suggestions had subsequently been carried into effect by legislative enactment, but among the recommendations awaiting adoption was one for the transfer to the Local Authorities of the metropolis of the duties now discharged by the District Councils. He expressed the opinion that public benefit and administrative efficiency would result from the adoption of this recommendation, and he strongly urged that, in any scheme for the reform of the Local Government of the Metropolis the proposed District Councils should be entrusted with the supervision of building operations in their several districts.

The police of the proposed street had received the endorsement of the Metropolitan Vestries. As a result of two meetings convened by thirty-four metropolitan vestries and district boards, and held at the Town Hall, Chelsea, a memorial was forwarded on August 5, 1890, to the Prime Minister, stating, "that in the opinion of this conference the office and functions of the District Surveyor under the Building Acts should be in the hands of the Local Boards and their officers, with an appeal to the London County Council." On February 28, 1896, a conference took place between delegates from the London County Council and the several vestries and district boards to consider, in view of contemplated changes in the government of the metropolis, what powers should be allocated respectively to the central and district authorities, and a resolution was carried similar in effect to that set forth above. The London County Council representatives did not vote on this resolution, and the Committee of the Council subsequently reported adversely to the view adopted by the conference, and that recommendation of the Council had since been confirmed by the full Council. On March 16, 1894, in giving evidence before the Royal Commission on the amalgamation of the City and County of

London, he submitted (*inter alia*) the following statement :—

"Upon the occasion of the delegates from the Conference on the Public Health (Amendment) Bill waiting upon the Local Government Board, on June 25, 1891, the Right Hon. C. T. Ritchie stated that it was his desire and intention in the District Councils Bill, which he hoped shortly to introduce, to enlarge the scope of usefulness and responsibilities of the Local Authorities in connection with such statement it may be fitly acknowledged that more desirable and important can be cast upon any Local Authority than the responsibility of seeing that the buildings within its district are erected in a sound and substantial manner suitable for human occupation, with due regard to the risks to health risks of the general community. As urged by the Local Authorities, in all such work should be vested in the Local Authority, as is the case in provincial towns. Drawings for each new building should be deposited, the intended drainage, depth of foundation, line of frontage, open spaces, water supply, and sanitary arrangements should be submitted to the Local Authority, upon the said drawings being approved, the work should be carried out under the supervision of the Local Authority, and on satisfactory completion a certificate given, which could be affixed inside the building. Such certificate would be of great advantage, both to the owner of, and the individual contemplating residence in the house. Unauthorised alteration of the drainage, or of the building, when completed as aforesaid, should be punishable. At the present time, after a drain has been completed, tested, and passed by the vestry's officials, there is nothing to prevent the occupier or other person making, without notice, some alteration which may entirely destroy the perfection of the drain. In any change on the lines hereinbefore advocated, a variation would be to pursue, take care that no injustice should accrue to the District Surveyors, and the work of the future would have to be safeguarded by precautions being taken to ensure proper knowledge and experience on the part of the officials undertaking the transferred duties. One of the risks under this head is in the hands of the surveyors, if the work is not sufficiently extensive or responsible to warrant the appointment of a properly qualified man at a sufficient salary to give the whole of his time to his public duties. No public Surveyor should be allowed to practise privately; the defects of such a dual system are well known and need not be dilated on. It may be difficult (as in small districts) to employ a man of sufficient standing, together, so as to create districts with a population of 200,000 each. Such an enlarged district could afford to pay for the whole time of a properly qualified surveyor or engineer, who would have no difficulty in finding ample scope for the useful employment of his skill. The work of a fairly large district can be done by a man of moderate execution than that of a very small district, especially where the Local Authority performs its own work instead of executing it by the aid of contractors."

It was possible, of course, that some individual cases of hardship might occur, but to any one acquainted with the building work of London it must be apparent that the duties of district surveyor and parish surveyor should be discharged by one official, corresponding to the Borough Engineer and Surveyor in the towns throughout the rest of England. If the two offices were amalgamated the District Surveyor would in some parishes probably be the best man to discharge the duties of the combined office, and in other parishes the present engineers and surveyors would be fully equal to the task. In any rate, individual interest must not be allowed to stand in the way of public advantage, and if the latter demanded a change there would be no more difficulty in getting qualified engineers and surveyors for the London District Councils than was experienced in the large towns throughout the kingdom.

These points he strongly urged when reporting to his Board on the London Streets and Buildings Bill, as the following extract would show :—

"It is a bad system to have two district surveyors: one responsible to the Council and the other serving the local authority, and both going over the same ground, and, to a certain extent, over the same work. The two officers should be rolled into one, responsible to the local authority, and discharging the same duties as now performed by the borough surveyors throughout the kingdom. The Vestry will understand that the suggested amalgamation of offices is not proposed in the interests of the professional class of which I am a member, but is simply made in the interests of the government of the Metropolis. Many of the district surveyors are better qualified to undertake the work of the borough surveyors than the latter are to absorb the functions of the former, but whenever such assimilation of offices does take place, properly qualified men would be appointed to any local authority, and that without injustice to any present surveyor, district or local."



In support of the policy of change, he would submit the following considerations which had induced him to propose the suggested transfer of powers and amalgamation of duties under the Building Acts and Metropolis Management Acts. He was of opinion that any one desirous of developing an estate or erecting a building should be able to ascertain at the town hall of the district everything required by the public authorities relative to such building or estate. At the present time an applicant was informed on attending at the town hall that he must give the Vestry seven days' notice before commencing the excavation of foundations, and must give concurrent notice to the District Surveyor as to commencement of building operations, and submit drawings of the proposed buildings for the approval of the District Surveyor; but the Local Authority had no power to call for such drawings, the seven days' notice to them being only required in order to afford an opportunity of serving a counter notice to keep the foundations up to a certain level, so as to insure proper drainage. Should the applicant desire to develop some building land he was referred to the London County Council, to whom he must first submit (in duplicate) plans of intended roads. The County Council forward one of the copies to the Vestry, and, guided more or less by their recommendation, approve or refuse them. Having received sanction to his plan for laying out the roads, the applicant became anxious to construct sewers, and was then told to send in duplicate plans to the Vestry, who, upon approving them, forward one copy to the London County Council for their sanction. After this double reverse process, generally taking considerable time, the applicant, having succeeded in getting his plans of roads and sewers passed, proceeded to build, generally constructing the sewer first, this work being carried out under the supervision, and to the satisfaction of, the Vestry. The foundations of the buildings were then proceeded with, the Vestry surveyor attending to look after the level and frontage line. Simultaneously the District Surveyor attended to look after the foundation site with regard to the necessity for concrete and the thickness of walls and spread of footings. The attendance of the Vestry Surveyor then ceased until the house drainage work was commenced, of which seven days' notice had to be given to the Vestry, under whose supervision the whole of the work (in addition to water supply) had to be satisfactorily carried out. In alterations to buildings and in the erection of blocks of flats, building work and sanitary work would be found progressing simultaneously, and the District Surveyor might be found looking after the proper construction of a wall, while the Vestry Surveyor was seeing to the soil-pipe attached to it. Generally speaking, in the majority of buildings, the drainage work was executed after the carcass of the building was completed, and it might be found, as in past cases, that the building, though erected in accordance with plans passed by the District Surveyor under the Building Act, did not conform to the by-laws framed under the Public Health Act by the London County Council, and enforced and supervised by the Vestry. Several such cases having occurred in Kensington, the London County Council were requested to furnish the District Surveyors with copies of the by-laws under the Public Health Act with an instruction not to approve plans submitted to them under the Building Act when such plans showed intended violations of the Council's by-laws. The Council, in reply, considered it inexpedient to give such instructions to the District Surveyors, whose duties were prescribed by the Building Acts. In consequence, at present it occasionally occurred that notice had to be served by the Vestry requiring a newly-built structure to be altered and amended in order to meet the requirements of the Council's by-laws.

Further overlapping supervision and occasional clashing arose with respect to lines of building frontage and the laying out of new streets, and also in relation to arches or vaults under public ways. With regard to the former, the District Surveyor was entitled to special fees under Section 155 of the Act, and as to the latter the fees were fixed under Schedule 3, Part I. of the Act.

Concurrently with the District Surveyor's supervision of frontage lines and of the laying out of new streets, the Vestry's Surveyor was exercising similar supervision, with the additional work of setting out the levels of the new streets and their intersections. With

regard to vaults under footways, the District Surveyor's duty was limited to looking after the brickwork in relation to the span of the arch, and he had no power to disapprove any work provided it fulfilled the conditions laid down in the Building Act, but the Vestry's requirements, which their Surveyor had to enforce, might demand fifty per cent. thicker head walls set back 2 ft. from the kerb line, backed up with concrete, with 2 ft. of space for electric, gas, and water mains, &c., left between the crown of the vaults and the paving.

Again, with regard to setting back buildings to be erected on open spaces within 20 ft. of the centre of the road, both the District Surveyor and Parish Surveyor had corresponding duties, and it occasionally happened that the former, in approving building plans submitted to him, lost sight of the fact that the abutting highway was under the full width, and the Parish Surveyor had afterwards to stop the building work in progress. If the work of the proposed new District Councils for London followed the course of procedure adopted in all other towns throughout England, these difficulties and cases of overlapping jurisdiction would not occur. In Leeds, Birmingham, Manchester, &c., by attending at the borough or town surveyor's office anyone could obtain all information necessary for his guidance in carrying out any building operations, and the advantages of this simplicity of procedure should not be denied solely to the metropolitan districts, many of which at the present time exceeded in population and rateable value most of the provincial towns possessing the advantage of self-government.

Another difficulty under the present system in London arose from the District Surveyor having no knowledge of or responsibility as to the sewers. Plans for buildings at the rear of old houses were approved by him, notwithstanding the existence of sewers running under the site of the new building, which it was illegal to erect in such position, but which, unless discovered by the Vestry within six months from completion, could not be demolished. The connexion of the District Surveyor with any new building ceased on its completion and the payment of his fees; there was no subsequent periodical inspection to detect violations of the law after the completion of the building. If such inspections were made he suspected that many infringements of the Building Act would be discovered, notably the erection of sheds and buildings in back yards, with consequent increased fire risks and reduction of air space. If the Building Act was administered by the Local Authorities the drawings of each building would be lodged with them; such drawings would show the situation and construction of the building, its drainage, sanitary adjuncts, water supply and open spaces attached to the premises, and the present officers to the Local Authorities in making their regular inspections at short intervals would be able to note any recent alterations to the premises.

As before stated the District Surveyors were remunerated by fees, out of which their assistants had to be paid, and it was unreasonable to expect the surveyor to provide and pay a body of perambulating assistants, to the serious diminution of his net income. He believed he was correct in stating that most of the cases of dangerous structures were notified to the District Surveyor by the vestry surveyor, and it must be borne in mind that the District Surveyor was not entitled to charge his fee for surveying any dangerous structure until directed by the Council to make such survey, as under Section 103 of the Act the existence of the dangerous structure must be notified to the Council before an instruction for its survey was given by them. Under the present system too much was left to chance; it was nobody's duty to find out or discover dangerous structures, and the collapse of a building might be the first intimation of its dangerous condition.

He was of opinion that no fees should be charged in respect of new buildings or dangerous structures. At the present time the supervision of drainage and sanitary work, water supply, and regular sanitary inspection were undertaken by the local authority and the expense thereof borne by the rates, and he failed to see any sound reason why one principle should not apply to the whole work of supervision.

He submitted that the interests of the community would be served by casting upon any

new District Councils, to be created for the future local government of London, the duties now discharged by the District Surveyors under the London Building Acts, and that the cost of carrying out such duties should be a charge upon the general rate of each district.

Mr. Thomas Blashill, in proposing a vote of thanks to Mr. Weaver, said that that gentleman's experience was unquestioned, but he (the speaker) was not able to go far with him. Mr. Weaver thought that the Building Act was badly administered by the district surveyors, and that it would be better done by the Parish Councils; but there was an absence of clear and specific evidence in the paper in support of that view, and in place of that there was mere opinion—often interesting and valuable, but still only opinion. There was one little correction which he should like to make at once, as to the number of district surveyors who were not permitted now to carry on private practice. There were now about one-fifth who were debarred—thirteen out of sixty-five. Mr. Weaver was evidently misinformed as to the amount of private work the district surveyor carried out. There was really very little done by district surveyors in their own districts. He (the speaker) was a district surveyor for ten or eleven years, and only once or twice had he been asked to carry out a private work; and on the only occasion that he did consent he had reason to regret it, for he was put to a great deal of trouble in the matter. He was sorry that Mr. Weaver had allowed some of his views to appear in his paper, especially those as to the surveyors in adjoining districts sometimes playing into each other's hands. If Mr. Weaver meant that he thought that did happen, it was much to be regretted, and if he did not mean that, then the paragraph meant nothing. Then Mr. Weaver had something to say about district surveyors being appointed merely because of their proficiency in design. His (the speaker's) experience was that candidates based their claims to a vacant office on the strength of their knowledge of and experience in the details of construction, rather than in their proficiency in design. The idea that the training of an architect was not necessary for a district surveyor was a most fallacious one. No one but an architect could properly carry out the duties of a district surveyor and he scarcely liked to think what the parish surveyor would say if the complicated duties of the district surveyor came before him, and how that parish surveyor would shape before the Tribunal of Appeal—a body composed of three architects, one of whom was also a qualified barrister. Mr. Weaver said it was a bad system to have two district surveyors in a parish. There were not two district surveyors. There was one office of district surveyor, and one only—though it was quite true that certain Vestry surveyors called themselves district surveyors. There were two officers, but they each performed different duties, and he could not see that there had been adduced any sufficient reason why there should not be two. The statutory examination by the Institute of Architects for the office of district surveyor had been alluded to by Mr. Weaver in a rather light and airy fashion, who said, apart from that, what qualification had the district surveyor? But that was the real qualification, for it showed that he was qualified to perform his duties. One of the benefits of the present system was that the district surveyor was an independent officer, and that he need not be influenced by any one. The same could not be said of the parish surveyor, even in the large parishes, to say nothing of the smaller, and he knew of cases where the parish surveyor had been afraid to carry out his duties properly. As to dangerous structures, he had taken some trouble to look into the matter and he had come to the conclusion that the parish surveyor was not able to look after dangerous structures, while the district surveyors were qualified by experience. As to fees, he differed from Mr. Weaver there. Why should the builder not pay them? The fees were a charge upon the building. This applied particularly in the case of dangerous structures, for why should the owner of the nuisance escape scot free? If the parish surveyor had the duty of looking after dangerous structures and other matters thrown upon them, they would have a very unpleasant duty to perform, and, what was more, they would not have the consolation of the fees which the district surveyor now received.



Mr. Alex Payne, in seconding the vote of thanks, said that from first to last there was hardly a word in the paper that he agreed with. The paper seemed to be an attempt to muddle up two totally different appointments—appointments which required absolutely different training, and in which there was absolutely different work. The parish surveyor was usually a C.E., and already had most important duties to perform, and he could not see any necessity for adding to those duties. Those duties had nothing to do with the carrying out of the Building Act, which could only be properly done by an architect; and in support of that view he quoted from the Act itself, from Section 78, dealing with public buildings, and other sections. How could the absolute control of all these buildings be properly placed in the hands of anybody but an architect? If the parish surveyor had those duties put upon him, he would be almost compelled to relegate them to architectural assistants, though they were far too important to be so relegated. Then there were the legal duties. The district surveyor had to enforce the Building Act by attendance at the law courts—the London County Council furnishing legal aid where necessary. Would the parish surveyor be able to do this, and would each vestry employ a staff of legal assistants? Then public and other important buildings were generally designed by architects, and what would they say if they had to submit those designs to some one whose training had not been an architectural one? Mr. Weaver asserted, without giving any evidence of it, that the present system of supervising buildings was a bad one, though he thought it was not the fault of the law, but the way the law was carried out; but let them think of the immense amount of work that had been carried out in the metropolis under the Building Acts in the last fifty years, and how few, comparatively, had been the accidents. He quoted the opinion of Dr. Longstaff, given some time since, that serious building accidents had been almost unknown in London owing to the skill of the officers who surveyed under the Dangerous Structures clauses; and of Sir John Hutton, lately expressed at the Council, that district surveyors were above suspicion, and did their work most efficiently, and thought these opinions showed the value of the sweeping assumptions of the author to the contrary. As for the assertion that the office of district surveyor was sought after by architects in order to increase their private practice, it amounted to saying that two or three hundred men, many of some eminence, including some of the Presidents of the Royal Institute of British Architects, had taken the office under false pretences. He gave his most unqualified denial to that. How was the author to know what the motives of those who had sought this office were? District surveyors had been appointed under this system for about fifty years, and during that time, as far as he knew, there had hardly been a case of corruption, or anything of the kind, and that was saying a good deal, when it was considered how much and how important work had been supervised during that time; but he thought the temptation to partial carrying out the law would be greatly increased if they were subordinate officers under the Vestry; which is what the proposals in the paper amounted to. He himself believed it was a mistake to debar a district surveyor from private practice as an architect. He believed the condition had been made in recent appointments by the Council with the very best intentions. The author said the objection to practising architects were too well known they need not be stated; but, he asked, what were they? It had been urged that in some cases practising architects were too busy to attend to the duties, but such cases had been so few as to show the fault was in the individual and not in the system, and if it was found that a district surveyor was not giving proper attention to his duties he could always be asked to resign. The author had suggested dividing districts up by population—say of 200,000 each—doing away with fees, and paying a salary chargeable on the rates. This would be throwing part of the cost of building on the ratepayer; besides, a district with a small population, if containing building land, would often give much more work to the surveyor of buildings than a populous district, and there would be no sort of relation between the pay and the work. The author stated that his object in proposing these

changes was to raise the status of the parish officials. Was it worth while, for such an object, to throw over a system which had worked as well as the present one had for half a century, and to start a crude experiment and place important duties in the hands of men unqualified for them by training and experience?

Mr. W. Woodward said that the previous speakers had misunderstood the paper. Mr. Weaver had never proposed the substitution of the Vestry surveyor for the district surveyor, nor had he said that the work of the District surveyor had been badly done. What he did suggest was an entirely new order of things—the establishment of a central body in the body of an intelligent and skilful official.

Mr. H. H. Collins said that he differed from Mr. Weaver from beginning to end of the paper. He regretted that the paper had been written, and especially that so many innuendoes were made in it. The title of the paper was a misnomer; it should have been: the desirability of transferring the duties of district surveyors to local authorities. The paper seemed to be the outcome of the unfortunate accident at Westminster; but that really had nothing to do with the question at issue, for what that accident showed was that the District Surveyor and the County Council took an erroneous view as to their powers under the Act. He very much regretted that Mr. Weaver had made certain remarks about district surveyors, and in that connexion he would like to mention the following names of those who had held, or were holding, such office—the late Professors Donaldson and Cockerell, Professors Kerr, Banister Fletcher, Roger Smith, Mr. Alex. Peebles, late City Architect; the late E. L. Anson, Past-President of the Institute of Architects; Thomas Edward Wyatt, Charles Fowler, and Douglass Mathews. Could the innuendo in the paper possibly apply to such men? The speaker then referred to the action of the Institute of Architects, the Surveyors' Institution, the Institute of Builders, the Land Owners' Association, and the Duke of Westminster, all of whom had impressed on Parliament the necessity of upholding the present status of the District Surveyor in the public interest. Surely these were the proper people to express an opinion in this matter. Neither architects, surveyors, nor builders had made any complaints. And why should there be any alteration? He failed to see why. He thought it was desirable to adhere to the present system, which gave them men of erudition—men who understood building matters and who had a thorough appreciation of the art side too. The functions of the District Surveyor were perfectly well understood and appreciated, and he did not see what more was required. He did not think that Mr. Weaver's views would get much sympathy from them, and he desired to move the following resolution: "That this meeting of the Surveyors' Institution does not agree with the views or conclusions expressed in Mr. Weaver's paper, entitled 'The London Building Act and the Official Supervision of Buildings.'"

The Chairman said the resolution was unnecessary, as the Institution was in no way committed to Mr. Weaver's views.

Mr. Douglass Mathews then moved, and Mr. H. Lovegrove seconded, the adjournment of the discussion.

This having been agreed to, the meeting terminated.

The next meeting will be held on January 9.

#### ARCHITECTURAL SOCIETIES.

THE GLASGOW ARCHITECTURAL ASSOCIATION.—At the usual monthly meeting of this Association, held in the Rooms, 187, Pitt-street, on the 6th inst., Mr. Geo. S. Hill in the chair, Mr. John Watson contributed a paper entitled "Domestic Architecture." Mr. Watson confined himself to a general view of the types of building which went to form the suburbs of large cities. He traced the existing styles of plan to the class of material used, prejudices arising mainly from economic causes. Mr. Watson showed by a large number of illustrations how different this class of building could be made if architects were but willing to adopt the many different materials which lay to their hands. This would in turn lead to improved types of plan and style of building generally.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of this Society was held on the 13th inst., at the School of Art, Mr. K. W. Fowler, President, in the chair. It was announced that the Council had arranged a series of lectures for the New Year by Mr. Hugh Stannus. Mr. Beresford Pite gave a lecture on "Michelangelo's Architecture." He said that the accepted verdict of architectural historians and critics was that Michelangelo's influence was detrimental to architecture. He then enlarged upon the extent and reasons of Michelangelo's influence, the great architect's mastery of the arts of design in sculpture and painting, and the noble character of his intellect. The importance of St. Peter's at Rome was emphasised. Imitative followers without his powers or opportunities came after him. His practical faith in the unity of art was evidenced in his work in the three directions of sculpture, painting, and architecture. There were the Madonna in San Lorenzo, in Florence, and the Pieta in St. Peter's in sculpture, and the figures of the ceiling of the Sistine Chapel in painting, which were instanced as having a basis of constructive design, and expressing ideas of scale, grandeur, breadth, and dignity of line in composition. Those qualities also existed in Michelangelo's architectural designs. The lecture was illustrated by drawings, photographs, and engravings. A vote of thanks was given to the lecturer, on the motion of Mr. C. M. Hadfield, seconded by Mr. C. J. Innocent, and supported by Messrs. E. M. Gibbs and the Chairman.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE AND ART.—The Council of this Institute held a conference with the architectural pupils and assistants in Lamb's Hotel on the 10th inst. to discuss the advisability of forming a students' section of the Institute. Mr. Charles Soutar, as Secretary, along with a Committee consisting of Messrs. Haxton (St. Andrews), Cullen, Dakers, and Marshall, were appointed, along with the Council of the Institute, to organise the section and arrange a syllabus of excursions, design classes, and lectures.

NORTHAMPTONSHIRE ARCHITECTURAL SOCIETY.—A meeting of the Committee of the Architectural Society for the Archdeaconries of Northampton and Oakham was held on the 12th inst. at the rooms of the Society, Abington-street. Sir Henry Dryden, Bart., presided. Mr. Harold Scrivener, architect, Gayton, was elected a member of the Society; and Mr. Markham presented the Society with two books one "Chaffers' Handbook to Hall Marks on Gold and Silver Plate," and the other "Markham's Handbook to Foreign Hall Marks on Gold and Silver Plate." Subsequently the annual meeting was held. The officers were re-elected, and Mr. Markham then presented the annual report, which showed a slight decrease in the membership. During the year the Society had been consulted as to the restoration of various churches, and the Rev. A. K. Pavey had been elected joint hon. secretary with Mr. Markham. The report was adopted, as well as the report of the Rev. E. L. Tuson, the hon. treasurer. Mr. T. Shepard then read a paper on "The Heraldry of Abbey and See and Cathedral of Peterborough," while Mr. E. A. Treen read a paper on "Barby Manor and Church." Mr. Shepard and Mr. Treen were thanked for their papers.

#### COMPETITIONS.

AGECROFT CEMETERY COMPETITION.—Numerous inquiries having been made as to this competition, we are authorised to state that twenty-two sets of plans were sent in but have not been opened, pending the receipt of sanction to use the land for cemetery purposes. This has been delayed owing to the opposition raised by the local authority in whose district the site is situated. The Home Office inspection of the land was made as long ago as July 15 last.

THE REBUILDING OF THE OLD BAILEY.—The City Corporation determined on the 8th inst. to retain the services of Professor Atchison, President of the Royal Institute of British Architects, in connexion with designs for the rebuilding of the Old Bailey, at an honorarium of 400 gs. Mr. Baddeley said the advertisements for the plans for the rebuilding of the Old Bailey would, he hoped, be out early in January, and he trusted that there would be little further delay in the matter.



## THE LONDON COUNTY COUNCIL.

**THE** usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Mr. McKinnon Wood, Chairman, presiding.

**Loans.**—On the recommendation of the Finance Committee, it was agreed to lend the Hammersmith Vestry 11,000*l.* for electric lighting purposes; Newington Vestry 10,000*l.* for electric lighting purposes; the St. Giles District Board 17,160*l.* for the purchase of land; and the Wandsworth Guardians 3,000*l.* for alterations and additions to the workhouse.

**The Works Department.**—The Finance Committee submitted the half-yearly statements of works executed by the Works Department up to September 30, 1898. The Lewisham main sewer has been constructed at a cost of 22,924*l.* above the final estimate. For the total half-year's returns of works there was a balance of cost above final estimate of 21,000*l.*, and since the establishment of the Works Department a balance of 40,860*l.* above the final estimates; but the loss appears to have been incurred during the late management. The total amount of jobbing works show a balance below schedule value of 6,185*l.* The consideration of the question was adjourned.

**Locomotives Act, 1898.**—It was agreed (a) that the Highways Committee be authorised, until the Council shall make a further order on the subject, to act on behalf of the Council in relation to all matters arising under the Locomotives Act, 1898, which comes into force on January 1, 1899; (b) that the Council, in the exercise of its powers under Section 14 of the Locomotives Act, 1898, do, until further order, authorise Sir A. R. Binnie, its Chief Engineer, to deal on behalf of the Council with all applications under Sections 1 and 3 of the Act, and to give or withhold, at his discretion, the permission or consent required as regards matters specified in those sections.

**The Housing Question.**—Some discussion took place upon a report by the Housing of the Working Classes Committee, with reference to the erection of working-class dwellings on land known as the Cotton-street site, Poplar. A proposal to sell the ground for the erection of dwellings had been rejected, and the Committee found themselves unable to build on the land without incurring a charge on the rates. They now asked the Council to agree that no further action should be taken with regard to building on the site.

An amendment by Mr. Dickinson was adopted to the effect that the recommendation should be referred back to the Committee, with an instruction to see whether plans could not be prepared for erecting dwellings upon the site which should not involve any charge on the county rate.

**The Widening of Parliament-street.**—The Improvements Committee recommended, and it was agreed, that the estimate of 12,000*l.* submitted by the Finance Committee be approved, and that, in connexion with the widening of Parliament-street and Charles-street now being undertaken by H.M. Office of Works, the Council do contribute on the usual conditions the sum of 12,000*l.* in respect of the making up of those two thoroughfares.

**The Water Question.**—The Report of the Parliamentary Committee dealing with the Council's water Bills was submitted. It was sought to obtain the consent of the Council to promote the various Bills in connexion with the Council's scheme for acquiring the London Water Companies and for bringing water from Wales. The report was agreed to.

**New Theatre (Cambridge Circus).**—The Theatres Committee brought up the following paragraph, the recommendation being agreed to:—"We have considered eight drawings, dated December 3, 1898, of a theatre which it is proposed to erect on a site at Cambridge Circus with frontages to Shaftesbury Avenue, Little Earl-street, Tower-street, and West-street, with a 10 ft. passageway from Tower-street to West-street. The site does not comply with the Council's regulations, as half of the total length of the boundaries of the site does not abut upon public thoroughfares, of which none are less than 30 ft. wide. We therefore recommend that the eight drawings be not approved."

**Blackwall Tunnel Conveniences.**—The Bridges Committee brought up the following report, the recommendation being agreed to:—

"Messrs. Doulton & Co. have informed us that they desire to withdraw their tender of 1,891*l.* 15*s.*

for the Blackwall Tunnel conveniences as, owing to an error, they have under-estimated the value of the work. They state that they would be prepared to carry out the work at an increase of 15 per cent. on their tender. In consequence of this withdrawal, we asked the Works Department at what price they were prepared to carry out the work. The manager reported that his original estimate for the work was made in July last, and amounted to 1,980*l.*, but since that date the prices of certain materials have gone up, viz., bricks 4*s.* per 1,000, cement 5*s.* 9*d.* per ton, steel joists 20*s.* per ton, stonework 1*s.* 3*d.* per foot cube, and brass work 5 per cent. The total increase amounts to 96*l.*, which makes his estimate 2,076*l.*, for which sum he is prepared to do the work. Messrs. Doulton's revised price amounts to 2,175*l.* 10*s.* Under the circumstances we think that the work should be entrusted to the Works Department. We therefore recommend:—(a) That the resolution of the Council of November 20 last, accepting the tender of Messrs. Doulton & Co. for the construction of public conveniences at the northern entrance to the Blackwall Tunnel, be not acted upon; (b) That the Council do sanction an expenditure of 2,076*l.* for the construction of conveniences at the northern entrance to the Blackwall Tunnel; that the works be carried out at that estimated cost by the Council, without the intervention of a contractor, and that the drawings, specification, and bills of quantities be referred to the manager of works for that purpose."

**Legal Proceedings.**—The Building Act Committee recommended, and it was agreed, (1) "That the solicitor do take all necessary steps for upholding before the High Court the decision of the magistrate in the proceedings taken by the Council with reference to the building erected by the South Metropolitan Gas Company in their yard at Rotherhithe-street at less than the prescribed distance from the centre of that street;" (2) "That the solicitor do take all necessary steps for upholding before the High Court the decision of the magistrate in the proceedings taken by the Council with regard to the wooden structures erected by coal merchants in the Great Central Railway Company's depot, at Carlisle-street, Marylebone."

**The Tramway Manager.**—Mr. Alfred Baker, manager of the Nottingham Corporation tramways, was appointed manager of the Council's tramways in the place of Mr. Young, who declined the position.

**The Strand Improvements.**—A long discussion took place with reference to the London Improvements (Holborn to Strand, Southampton-row widening, High-street, Kensington, and other works) Bill. An amendment was moved and seconded to the recommendation providing that the interest on sums paid for purchasing properties and generally for effecting improvements should, for the first few years before the completion of the improvement, be treated as part of the expenses payable out of the money borrowed and provided accordingly. The amendment was lost and the Bill approved.

**Competitive Designs for Dust Carts.**—The Public Health Committee recommended the Council to issue an advertisement offering a premium of 25*l.* for the best design of a dust-cart and cover, and that Sir Douglas Galton be asked to adjudicate. This was agreed to. The Council adjourned soon after seven o'clock.

## APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

At the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the London Building Act, 1894. Those applications to which consent has been given are granted on certain conditions.\*

## Lines of Frontage.

**Greenwich.**—An iron and glass shelter at the entrance to the Parthenon Music Hall, on the east side of Crooms-hill, Greenwich (Mr. W. Hancock for Mr. A. A. Hurley).—Consent.

**Hampstead.**—A porch and angle turret to proposed residential flats on the north side of Sumatra-road, West Hampstead, at the corner of Samwell Crescent (Messrs. Plagrove & Co. for Mr. G. A. Clements).—Consent.

**St. George, Hanover-square.**—Inclosure of the sides and front of the portico at No. 59, Belgrave-road, Pimlico (Mr. W. H. Hewish for Miss Tennant).—Consent.

**St. Pancras, North.**—Buildings on the west side of Highgate-road, St. Pancras, between Greenwood-place and Carke's-lane, with a one-story building in front of the building next Highgate-road, and the widening of parts of Greenwood-place, Carke's-lane and Highgate-road (Messrs. Maple & Co., Limited).—Consent.

\* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

**Wandsworth.**—Houses with one-story shops on the site of The Hawthorns and grounds, on the west side of Balham High-road, at the corner of Marius-road (Mr. F. Perks for Mr. R. Simpson).—Consent.

**Woolwich.**—Two-story bay windows in front of twenty-two houses on the south-west side of Brewer-street, Woolwich (Messrs. Church, Quick, & Whincop for Mr. H. H. Church).—Consent.

**Hampstead.**—A one-story studio addition to St. André's Villa, Mortimer-road, West Hampstead (Mr. L. Littlewood).—Refused.

**Islington, East.**—A one-story shop at the side of No. 368, Essex-road, to abut upon Oakenden-road (Mr. E. A. E. Woodrow for Mr. W. Jay).—Refused.

**St. George, Hanover-square.**—Erection and construction in glass and iron of a conservatory with bath-room over, on the porch at No. 2, Upper Belgrave-street, to abut upon Chester-street (Messrs. G. H. Morton & Son for Lady O'Hagan).—Refused.

**Wandsworth.**—That the Council do make no order with reference to the application of Messrs. J. Whittaker & Co., for consent to the erection of a one-story office at Knight's Hill, coal depot, Rosendale-road, Dulwich.—Agreed.

## Width of Way.

**Bow and Bromley.**—A building on the east side of St. Leonard-street, Bromley-by-Bow (Mr. R. T. Kingham for the London General Omnibus Company, Limited).—Consent.

**Dulwich.**—A house on the western side of Underhill-road, Camberwell, to flank upon a footway leading from Underhill-road into Overhill-road (Mr. J. Watt).—Consent.

**Rotherhithe.**—Three-story stables on the east side of Stone-lane, and also on the west side of Vine-street, Rotherhithe (Messrs. Newman & Newman, for the proprietors of Hay's & Cotton's wharves).—Consent.

**St. Pancras, East.**—A two-story stable and coach-house in the garden at the rear of No. 160, Camden-road, St. Pancras, to abut upon Camden-narrow (Mr. A. Bell).—Consent.

**Woolwich.**—Buildings and forecourt boundaries in parts of Union-street and Union-buildings, Powis-street, Woolwich, at less than the prescribed distance from the centre of the road (Mr. H. P. Monckton & Messrs. Church, Quick & Whincop, for their respective clients, Captain R. A. Ogilby, the freeholder, and Mr. H. Wright, Mr. H. H. Church, Mr. S. H. Cuff, and Messrs. Sanders & Webber, the leaseholders of the property).—Consent.

**Woolwich.**—Widening of parts of Union-buildings and Union-street, Powis-street, Woolwich (Mr. H. P. Monckton & Messrs. Church, Quick, & Whincop for their respective clients, Captain R. A. Ogilby, the freeholder, and Mr. H. Wright, Mr. H. H. Church, Mr. S. H. Cuff, and Messrs. Sanders & Webber, the leaseholders of the property).—Consent.

**Chelsea.**—Stable buildings on a site between Nos. 39 and 40, Ridley-street, King's-road, Chelsea (Mr. J. J. Connelly).—Refused.

**Hampstead.**—That Mr. H. Marnham be informed that his application for a modification of the conditions attached to the Council's consent of December 20, 1897, to the erection of a two-story building on the west side of Streetley-place (formerly Brew-house-lane), Heath-street, Hampstead, so far as relates to a proposed inclosure of the land dedicated to the use of the public, having been fully considered, the Council have resolved to adhere to the decision of December 20, 1897, upon the application.—Agreed.

**Eden-place, West.**—A factory on the west side of Eden-place, Eden-grove, Holloway (Messrs. Truefit & Watson for the Star Brush Company, Limited).—Refused.

**Rotherhithe.**—A one-story building on the east side of Tulip-place, New Church-street, Bermondsey (Mr. W. Freeman for Messrs. Mackey, Mackey, & Co., Limited).—Refused.

**Woolwich.**—An addition to the Woolwich Theatre, at less than the prescribed distance from the centre of Rope-yard-rails (Mr. F. Matcham for Mr. S. Barnard).—Refused.

**Poplar.**—That the Board of Works for the Poplar District be informed, in reply to their letter protesting against the action of the Council in consenting to the erection of a dwelling-house on the west side of Cottage-street, Poplar, to abut upon Finch-lane, as shown upon the plan deposited by Mr. J. Fox, notwithstanding the fact that the Board were of opinion that the application should not be granted, that after full consideration of the representations made by the Board with respect to the subject, the Council in the exercise of its discretion saw no reason to object to the erection of the house in question, and cannot agree with the Board that a decision has been arrived at in this case to which exception could properly be taken.—Agreed.

## Open Space about Building and Widening of Street.

**St. Pancras, South.**—A modification of the provisions of the London Building Act, 1894, with regard to open spaces about buildings, so far as relates to the two houses, with shops on the ground floor, on the site of No. 27, Tottenham Court-road, and a portion of No. 13, Stephen-street; St. Pancras, without an open space at the rear of the new houses, and widening of a part of Stephen-street (Mr. P. Dollar for Viscount Gort).—Consent.



## Width of Way and Deviations from Certified Plans.

**Bermondsey.**—That the Council do, in the exercise of its powers under Section 13 of the London Building Act, 1894, consent to the position proposed to be adopted in the rebuilding of the "Royal Fort" public-house, No. 131, Grange-road, at the corner of Fort-passage, and the position proposed by the District Surveyor under Section 43 of that Act, so far as relates to the rebuilding of the premises (Mr. C. H. Flack for Mr. R. Ireland.—Consent.

## Open Spaces about Buildings.

**Islington, North.**—A variation from the plan approved on December 21, 1897, for the rebuilding of the "Boston Arms" public-house, Junction-road, at the corner of Dartmouth Park-road, with an open space at the rear (Mr. G. J. Thorpe for Mr. W. Lewis).—Consent.

## Deviation from Certified Plans.

**Holborn.**—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "William the Fourth" public-house, No. 10, Beauchamp-street, Leather-lane, Holborn (Mr. M. T. Saunders for Reid's Brewery Company, Limited).—Refused.

**Islington, East.**—Certain deviations from the plans certified by the District Surveyor under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "King's Head" public-house, No. 126, Blackstock-road, and two-story cottages on the west side of Mossell-lane, Islington, at the rear of the public-house (Mr. F. Waghorn for the Camden Brewery Company, Limited).—Refused.

## Line of Fronts and Width of Way.

**Battersea.**—A two-story building on the west side of Ford's-place, Church-road, Battersea (Mr. A. C. Forester for the Morgan Crucible Company, Limited).—Consent.

**Chelsea.**—Additions to Christ Church, Christchurch-street, to abut also upon Caversham-street (Mr. J. A. Reeve for the Vicar and churchwardens of the church).—Consent.

**Bow and Bromley.**—A building upon the site of Nos. 79, 78, and 80, Ford-street, Bow (Messrs. Holman & Goodrich for Messrs. Johnson Brothers).—Refused.

**Strand.**—An iron and glass shelter in front of the Loudoun Hotel, Surrey-street, Strand (Messrs. Ventom, Bull, & Cooper for the Loudoun Hotel, Limited).—Refused.

## Width of Way and Temporary Buildings.

**Hoxton.**—A wooden store shed erected in the brewery yard on the north side of Bacchus-walk, Hoxton, at less than the prescribed distance from the centre of the road (Mr. C. R. Winter for the Hoxton Brewery Company, Limited).—Consent.

## Formation of Streets.

**Haggerston.**—That an order be issued to Mr. B. Crewe, sanctioning the formation or laying-out of a new street, for foot traffic only, to connect Cotton's-gardens with Hudson's-court, Kingsland-road, Shoreditch (for Mr. J. Weibking). That the name Cotton's-gardens (in continuation) be approved for the new street.—Agreed.

**Fulham.**—That an order be issued to Mr. R. Groom, sanctioning the formation or laying-out of proposed new streets for carriage traffic on part of the Peterborough Estate, on the south side of New King's-road, Fulham (for Mr. A. N. Smeed). That the name Studridge-street (in continuation) Chipstead-street, Bradbourne-street, Chiddingstone-street, and Quarrendon-street be approved for the new streets.—Agreed.

**Lewisham.**—That an order be issued to Mr. A. Sykes, sanctioning the formation or laying-out of two new streets for carriage traffic, to lead out of Woolstone-road into Vancouver-road, Forest Hill (for Mr. G. Badman). That the names Kilmore-road (in continuation) and Elsinore-road (in continuation) be approved for the new streets.—Agreed.

**Greenwich.**—That an order be issued to Mr. J. Ellis, sanctioning the formation or laying out for carriage traffic of a new street to lead out of Cedar-grove into Woolwich-lower-road, Charlton. That the solicitor do continue the proceedings directed to be taken in the matter.—Agreed.

**Wandsworth.**—That an order be issued to Messrs. Tompkins & Barker refusing to sanction the formation or laying out for carriage traffic of a new street on the Woodlea estate, on the eastern side of Bedford Hill-road, Balham.—Agreed.

## Cubical Extent.

**Poplar.**—Erection at London-yard Manchester-road, Cubitt Town, Poplar, of an addition to a building of the warehouse class, such addition to exceed in extent 250,000 but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of machinery and boilers for steam vessels (Messrs. Bradshaw, Brown, & Co., for Messrs. Yarrow & Co., Limited).—Consent.

Recommendations marked † are contrary to the views of the Local Authorities.

## LONDON BUILDING ACT, 1894.

## THE TRIBUNAL OF APPEAL AND SECTION 29.

The Tribunal of Appeal under the London Building Act, 1894, sat at the Arbitration Room of the Surveyors' Institute, on Wednesday, to hear an appeal made by Messrs. William Seaman and Harry Guest (by their solicitors, Messrs. Underwood, Son, & Piper) against the certificate of the Superintending Architect of the London County Council, dated November 19, 1898 (under Section 29) by which he certified that the building specified on the plan "is situate in the street called Bravington-road, Harrow-road, which street is shown on the same plan; and that such building is also situate in the street called Mozart-street, which street is also shown on the said plan."

The members of the Tribunal sitting were Messrs. Arthur Bates (chairman), A. H. Hudson, and Penfold. Mr. G. A. Scott, barrister, appeared for the appellant, and Mr. Seager Berry, from the Building Act Department of the London County Council, for the respondent.

Mr. Scott, in opening the case for the appellant, remarked that the fact that the members of the Tribunal had personally inspected the site in question would very much simplify his task of presenting the facts to them. Mr. Seaman, he explained, entered into a contract so far back as May 26, 1886, for the development of the estate belonging to the Neal family, the present freeholder being Sir Algernon Neal. The plans attached to the contract were all passed by the Metropolitan Board of Works, then existing. It was now proposed by Mr. Seaman to complete the buildings there provided for by erecting the corner house at the junction of Bravington-road and Mozart-street. A serious question affecting the building line arose, however, and police-court proceedings ensued. The result of these was that the magistrate adjourned the summons *sine die*. Thereupon the London County Council served a notice upon the appellant to appear before the Superintending Architect under Section 29 of the Act to decide whether the site in question was situate in Bravington-road or not. The Superintending Architect was thus in the position of having to reconsider his own decision. He did this by deciding that the premises were situate in both streets and his certificate to this effect was that against which they now appealed. He (Council) had some confidence in asking the Tribunal to decide that the Superintending Architect was mistaken, in support of which he would cite the case of Barlow v. the Vestry of St. Mary Abbots, Kensington, and the remarks of Lord Herschell in his judgment in that case tried in the House of Lords. Briefly what was laid down there was that such cases should be decided on the circumstances. Although the duty of the County Council was to see that public rights were not infringed, no reasonable man could on the facts of this case believe that any individual was attempting to do so; on the contrary, he ventured the opinion that the interests of an individual citizen were being overridden by the so-called protectors of the public interests.

Mr. Seager Berry raised the question as to whether the date of the contract did not place the case outside the Act of 1894.

Mr. Scott submitted that the contract could not in the face of the Superintending Architect's certificate be taken into consideration except as a contribution to the facts.

The Chairman ruled that all they had to deal with was the certificate of the Superintending Architect.

The appellant, Mr. William Seaman, and Mr. Edward Vigers, architect to the freeholders of the estate, having briefly given evidence,

Mr. Seager Berry asked the Tribunal to uphold the Superintending Architect's certificate on the ground that the building was, under the Act, situate in both streets. The argument as to the hardships the appellant would suffer were rather more suitable to advance on an application for consent to advance on the line. For many years in London the idea existed that a corner erection was only bound by the building line in one street. Since 1886, however, when the De Vere Gardens case came before the House of Lords, it had been consistently laid down that the building was bound by the general building line in both streets. Case after case that had been decided supported this view. Among them being Gilbert v. Wandsworth District Board of Works (Law Times, N.S., vol. 60, p. 140); Warren v. Mustard (Solicitors' Journal, November 21, 1891); the London County Council v. Lawrence (Justice of the Peace, September 30, 1893); the same v. Cross (Solicitors' Journal, vol. 36, p. 474, and p. 486 in the Court of Appeal); and the same v. Fryor (Justice of the Peace, April 4, 1896, p. 215, Divisional Court). The meaning of Section 29 exactly coincided, he contended, with the view he advanced.

Mr. Scott, in reply, argued that to say that because a corner building was physically situated in two streets it was the same under the Section, was a *reductio ad absurdum* of the whole scheme of the Legislature. What he contended was that each case must be decided on its merits.

Eventually the Chairman announced that the Tribunal dismissed the appeal with costs, remarking that they felt bound to do so on the facts.

## NEW GYMNASIUM AND WORKSHOPS, BOROUGH POLYTECHNIC.

The latest addition to the Borough Polytechnic is a block of building containing upon the ground floor a gymnasium, 82 ft. by 36 ft., with a running track, 6 ft. 9 in. wide, forming a gallery round and supported upon cantilevers. The gymnasium is arranged as a public hall with the necessary exits and staircases, and a licence has been obtained from the London County Council for music, &c. The floor is laid with wood blocks in solid fireproof construction, and the hall is covered in with an open roof and lanterns in Oregon pine. Adjoining the gymnasium and gallery are the leaders' and teachers' rooms and locker rooms, all fitted with shower-baths and water-closets, &c. These rooms will be available for artists when the hall is used as a concert-room.

The basement is appropriated to four workshops and a model bakery with lavatory accommodation. The workshops are 26 ft. by 20 ft. each, 13 ft. high in the clear, and well lighted and fitted with the various appliances for the trade to be taught. The bakery is 36 ft. by 24 ft., fitted with two gas stoves, most modern appliances in ovens and bakery machinery, the necessary power being supplied by an electric motor. The walls are faced upon the inside with Fletton bricks and distempered, excepting the bakery, where the dados, &c., are formed in Opalite, as being more cleanly.

Extensive alterations and additions have also been made to the old buildings, resulting in the addition of a cookery school, a physics lecture theatre, laboratory and research rooms, with boiler and engine rooms in the basement.

The cookery school is a room 38 ft. by 23 ft., with open timber roof and lantern, with gallery and desks at one end, and is fitted with two gas stoves, kitchen for use of coal, and an ordinary hub grate such as is found in the old houses of the neighbourhood, with sinks, draining boards, dresser and plate-rack, &c.; the floor being formed with a centre of wood blocks and a margin of tiles.

The physics lecture theatre is arranged with rising galleries, with desks and lecture table with all fittings, whilst adjoining is the laboratory, 38 ft. by 20 ft., and research room, 20 ft. by 12 ft. Beneath these rooms are the refreshment and club rooms, which have been remodelled; and in the basement is a spacious boiler and engine house, now being fitted with steam boiler and condensers for heating and electric lighting, and it is proposed to lay down a full electric light and power plant here, and to devote the space to the study of electrical engineering.

The buildings have been carried out by Mr. W. Shepherd, of Bermondsey New-road, from the designs of Mr. Rowland Plumble. Mr. W. Finney has acted as clerk of works. The steam boiler is being supplied by Messrs. Daniel, Adamson, & Co.; and the warming, water, and hydrant services, &c., throughout have been executed by Mr. W. G. Cannon, of London-road. The laboratory and lecture room fittings are by Messrs. Geo. Hammer & Co.

## Correspondence.

## To the Editor of THE BUILDER.

## THE ARCHITECT'S USE OF BOOKS.

SIR,—I may point out that, although broadly concurring with your remarks on my little paper before the Architectural Association Discussion Section, I am impelled to reply on certain points, as the impression conveyed to you by the *résumé* is pardonably incorrect.

As I was addressing students I naturally laid the primary stress on (1) "the books you make your self," i.e., sketch books, measured-work portfolios, photographs, rubbings, and note-books. However rough one's own sketches may be, the fact of having jotted them down helps the memory so much that, although you may quite have forgotten, let us say, "that delightful visit to Somerset," the sight of five minutes' hasty pencil-work recalls the whole scene of fact and refreshes the imagination. After these (2) come "books of reference;" then, naturally (3), the "books with as little letterpress as possible." The works you mention come under the head of No. 3.

Nothing is more self-evident than that the absolute "crib," which you so rightly castigate, should be discouraged. Yet the ignorant cribber can actually crib, and can caricature to his heart's content in any foolish manner he may conceive from measured drawings to scale. It is only an architectural artist who can assimilate and recreate from the published photographs, *in perspective*, to be found in works like that of Gutsch. Wherein the spirit of the art is emphasised rather than the T-square of the copyist assisted. Tell he-his lies never so exquisitely, even such works as those of Penrose would, in this sense, be of far greater value to the student had they been emphasised by some endeavour to show pictorially what the final and real artistic effect would be to the eye of the beholder.

Other reasons in favour of limited letterpress are (1) that the particular impressions of the author are not so much wanted as the actual facts about the building; (2) the less the letterpress in relation to the



work the greater presence of the artist himself, in contradistinction to the editor, and the greater effect on the mind of the genuine student; (3) more care and money can probably be then expended on the illustrations.

With regard to imitative architecture, let me quote from my paper: "It must clearly be borne in mind that strive how you will, refuse to look at all modern work illustrated, ignore the Orders, affect 'originality,' you can do nothing good that is new except with a new material. *The most you can do is to make new combinations.* It is this well done that constitutes architecture, and has a freshness which will not die during its creator's life at the very least. Matters of taste are matters of knowledge."

In our struggle for the advancement of architectural art in England, we must ever distinguish between that which arises spontaneously and in harmony with national idiosyncrasies, climatic and building necessities, and any other which partakes rather of the facile imitation of the monkey. The former is the work of the thinker, the artist, the leader. The latter cannot help forward any movement of solid or permanent character.

The whole history of architecture teaches this lesson. We can never too clearly mark the dividing line between the one and the other, and must always remorselessly separate the pure wheat from the worthless chaff. In all I have advanced, I venture to insist that I have pointed out the right way to the student.

To take an illustration. St. Pancras Church, however faithfully reproduced from ancient Greek examples, can never be classed with works of creative art. Has any architect, not a fool, ever learnt any lesson from it except that which every mistake teaches? Even assuming every main feature to be "correct," the more accurately every moulding and detail has been copied, the more is it seen to be ill-adapted to the English climate and London soil, and the more we are convinced that its whole is quite wrong and unsuitable for an English church of the nineteenth century.

Similarly, in the present rage for building new theatres, the attempts to copy Spanish types fail to enable architecture, even in its simplest forms, to rise to the true expression in building, which the apparent renaissance of the English drama demands.

If we cannot learn honestly from old work, by all means let it be swept off the face of the earth. If we can, then the more honestly and completely the better.

And here let me say, not without some regret, that in a large proportion of architectural works the letterpress is the least instructive and valuable part. Hence, generally, I hold that the less individuals air their half-formed or immature opinions on old buildings, instead of giving us more of the solid facts of the buildings in the shape of drawings and details, the better for architectural education.

I cannot imagine, sir, that you could have intended to doubt the value of standard works of reference or histories, dictionaries or encyclopedias, so far as these are true, reliable, and learned. And I hope I am not so juvenile as to wish my young fellow-architects to depend alone on pantomimes or pictures.

Let me conclude, if I may, with a suggestion for your own journal. In order to make on our shelves an important row of reference books of infinitely more value to the profession, could you see your way to make and issue a complete index to 1900, and then start a new series?

PHILIP APPLEBY ROBSON.

#### Westminster.

\* \* The index question has been often before us, and has often been suggested by other correspondents. As to other points in Mr. Robson's letter, we do not consider that a single one of the books mentioned in our article of last week comes under his second head of "Books of Reference"; they are books for study. Gwilt is called an "Encyclopedia," but is a great deal more than what is usually implied in that title. The opinion that "in a large proportion of works on architecture the letterpress is the least instructive and valuable portion" is in many cases (we do not say in Mr. Robson's) due to the fact that the students never study the letterpress; they only look at the illustrations; and that is just where we think the mistake lies.—ED.

#### BOOKS RECEIVED.

SHURBRAN RELICS OF OLD LONDON. NORTH OF THE THAMES.—By T. R. Way and H. B. Wheatley, F.S.A. (George Bell & Sons.)

THE PURIFICATION OF SEWAGE.—By S. Barwise, M.D. (Crosby Lockwood & Son.)

LITHOGRAPHY AND LITHOGRAPHERS.—By Joseph Pennell and E. Robins Pennell (T. Fisher Unwin.)

EVERYBODY'S GUIDE TO CARPENTRY. By John Black (W. R. Russell & Co.)

ELECTRIC LIGHTING, ROCHDALE.—On the 7th inst. Colonel A. J. Hepper, R.E., held an inquiry at the Rochdale Town Hall with respect to an application on the part of the Rochdale Corporation to borrow 30,000*l.* for electric lighting purposes. There were present Mr. Platt, Borough Surveyor, Mr. Lacy, of London, consulting engineer, and others.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—XXIV.

HEAT: FUSION.

VERY substance begins to fuse at a certain temperature, which is invariable for each substance, if the pressure be constant. Whatever be the intensity of the source of heat, from the moment fusion begins the temperature of the body ceases to rise, and remains constant until the fusion is complete. Such are the results, epitomised by Ganot, obtained by physicists in regard to fusion. The student will hardly grasp the far-reaching applications of these two laws as applied to materials of construction derived from fused products. Let us endeavour to explain a few of them.

"If the pressure be constant," we say above, but is it ever constant in practice? Take cast iron, to begin with. The strength and the value of such a material rests almost entirely upon its molecular, and hence partly crystalline, structure. The top of a pig of such iron cools at the pressure of about 14 lbs. per square inch, the normal pressure of the atmosphere at sea level; but the bottom of the pig also, which, as we see by the above law, prevents that part from cooling at the same rate as the surface. This may not, at first sight, seem very important, but it is at the root of most of the difficulties of the maker of cast-iron articles used in building. If it were possible for the whole of the pig to cool at the same rate there would be no torsion from within, there would be no tendency for a cryptocrystalline or acicular crystalline structure to be set up in any one portion of the pig than at another, minute air cracks, forming lines of weakness akin to brittleness, could not be formed, impurities instead of being surrounded radially by a species of incipient crystallisation would be passed over and absorbed in the general well-being of the regenerated pig, and, in short, the manufacturer, instead of having to deal with a very obstinate substance, would have under his control a homogeneous material with which he could do almost anything in the way of casting.

But that is impossible by the above laws. The vast majority of the inventions in recent years, dealing not only with the manufacture of cast-iron, but with wrought-iron and steel, have for their aim (often without their inventors knowing it) the attempt to circumvent Nature in the practice of these laws. These laws are of the "Medes and Persians" type. Any attempt to ignore them must also ignore two laws of a much more inexorable type, viz.: that the molecular structure of a mass (whether of metal or any other substance) in a state of fusion depends on the rate at which the substance cools, and upon the pressure under which it cools. The two are very much bound up in one another; but there is a great difference between them.

Suppose we take a substance and melt it in a crucible in presence of great heat—not a low heat, as in melting lead and the like, though even there the two laws could be shown to apply to some extent. Well, take the molten matter in the crucible out into the open air of the foundry and let it cool. Then examine it. It is found to be practically structureless; at least, a micro-examination will show that only a very few microliths (not true crystals) have formed. They will not, in the majority of cases, give any bias to the direction into which the cooled mass may be broken or split. There will be no cleavage, but there will, generally, be much brittleness, especially when the material is of a basic character. What few crystals have formed will be of a nomadic nature and will not have power to determine the strength, absorption, or durability of the whole. The manufacturer does not very often regard the facts in this light, but knows, by practical experience, that fused substances rapidly cooled must always be regarded as inferior to those which have not been so drastically treated.

Therefore, by way of experiment, we may place the crucible and its contents again in the retort. This time reduce the heat slowly; take some days, if need be, in the operation. Examining the cooled material, we find that, in general, it is of a more crystalline nature. From this we learn that the rate at which a body cools (apart from the pressure) materially influences its molecular structure. In short, it becomes tougher, though the degree of tough-

ness will, of course, be closely connected with the actual nature of the substance operated upon.

Reverting to the law enunciated in the first sentence of this article, it will now be more readily understood that in addition to rate of cooling of a molten mass, the pressure promotes difference in crystalline structure, i.e., strength and adaptability for many constructional purposes. Again take the crucible with its contents and replace it in the retort; but, this time, place some weight upon the contents, tightly fitting within. To begin with, the point of fusion is made higher by the introduction of the increased pressure, and when the temperature in the retort is lowered, the fused mass will take longer to cool. That is followed by still more crystalline conditions within the mass, though whether allotriomorphic, cryptocrystalline, or micro-crystalline conditions will set in, depends on the chemical composition of the mass, and the amount of pressure. When metallurgists have succeeded in producing truly holocrystalline structure in artificially prepared materials we may hope for a complete revolution in the strength of girders and the like. At present the strength of girders and the like. At present they are more inclined towards varying the chemical nature of the materials of construction, than towards novel methods of manufacture, which is a retrograde movement. The real reason for this is the enormous expense attending experiments in attempting to produce holocrystalline structure. An incipient method has long been in vogue, but it can never take precedence over holocrystallisation produced from direct fusion, or from the promotion of chemical changes in molecular structure under the influences of great heat and pressure. That method is the rolling of steel or other metal, whereby an acicular structure is arranged, in a way, in the mass. The civil engineer will know what the result of this is, in the "fatigue" of metals in girders, steel rails, and what not. The architect will know of the deterioration of metallic supports owing to vibration in buildings.

It is more than probable that the masterly researches of Professor Dewar and others will indicate to us, in the near future, what may be expected from exceptional cold (artificially produced) as a method of promoting "fusion." It seems that phenomena hitherto produced by intense heating may also, to some extent, be engendered by careful treatment at very low temperatures. Two or three years ago the average metal manufacturer would have smiled at any statement to the effect that metals could be made into alloys without their being melted. Now, the difficulty is to define what we mean by "melted," and that begets the meaning, also, of the term "fusion." Many of the more important metals have already been alloyed at extremely low temperatures, and we should not be surprised if the result of these experiments, in the long run, does not succeed in producing holocrystallisation. Those who have never studied the micro-structure of metals used in construction, or who may not be aware of the molecular alteration they undergo in many cases (especially in vibration) in buildings, can hardly appreciate the benefits that may accrue from the production of that more stable condition in structure. Fusion, and what attends it, is to-day the all-absorbing topic of the metal and alloy-manufacturer. Heat, and the cheapest methods of producing it (or, rather, augmenting it artificially), comes under his every-day consideration. But we are entitled to believe that the next generation of metal-makers will pay more attention to reduction of metals by extreme cold, and that the coal bill (and even the arc-furnace) and all that appertains to it, except in a very limited way, will be things of the past. These are interesting topics to speculate upon, but it is dangerous to prophecy, and much safer to treat of fusion as we understand it in practice to-day.

Not long since—a year or two—we should have been able to give a list of refractory substances. Now we hesitate to describe any substance as being "refractory"—i.e., not to be melted. The linings of furnaces consist of materials believed until recently to be *per se* infusible. Those who have followed for some years the gradual breaking down of such materials, as higher temperatures were produced, can have but little faith in anything being infusible. Indeed, that is inconceivable from what is known concerning igneous fusion carried out by Nature, in rocks and under many conditions. Nature is a fairly safe guide in



such things, and when we were told by the advanced physicists of a few years ago that quartz was infusible, lime could not be reduced, and alumina and magnesia refused to succumb to the effects of heating, it was only necessary for the closer student of Nature to reply that she had done these things in her laboratory, and that the refractoriness remained rather with the substances treated. We are unquestionably, on the threshold of many important discoveries in this branch of physics, and it is dangerous to perpetuate past results, which are being modified every day, and materially, even since this series of articles on elementary physics was commenced.

## OBITUARY.

**PROFESSOR HAYTER LEWIS.**—We regret to record the death, at the age of eighty, of Professor Hayter Lewis, F.S.A., which took place at his house in Kensington Gardens-square on Saturday the 10th inst. Professor Lewis was an old Royal Academy student and subsequently a pupil of Sir William Tite. He afterwards spent two years in travelling on the Continent, and subsequently went into partnership with Mr. Finden, in conjunction with whom he built the Panopticon, shortly afterwards converted into the Alhambra Theatre. In 1860 he took up the duties of Hon. Secretary of the Institute of Architects, which he carried on for some time, and a few years later he was appointed Professor of Architecture at University College, a kind of position for which his special requirements eminently fitted him. He designed and carried out the southern return wing of University College, which formed the commencement of what promised to be a fine addition to or rather completion of Wilkins's building, until spoiled by the ill-judged additions subsequently made. Among Professor Lewis's other buildings were the Infant Orphan Asylum at Westcote, No. 4, Crown-court, Austin Friars; and (in conjunction with Mr. W. Slater) the first portion of the restoration of St. Bartholomew's. Among his literary works were the article on "Architecture" in the "Encyclopædia Britannica," and a small but important work on "The Holy Places of Jerusalem," the concise result of a good deal of special study. Professor Lewis had, shortly before, we should imagine from his frail appearance, rather weak health, and for the last few years of his life he was almost a confirmed invalid. He was a man of much individuality of character and attainments, and one whose opinion on disputed points either in architectural history or criticism was always held in high repute.

**MR. F. BARNES.**—The death has just taken place of Mr. Frederick Barnes, architect, of Ipswich. Mr. Barnes, who had reached his eighty-fifth year, went to Ipswich in 1843 to assist his friend John Medland Clark in his work of the new Customs House. Shortly after he was engaged by Mr. Braith, for whom he designed the station and buildings on the Eastern Union and other railways under his direction. In 1850 Mr. Barnes began a general practice, and was awarded the premium in the competition for the Ipswich Grammar School. He also won the competition for the Public Hall at Melton, and St. Mary Magdalene Church in the same town. Shortly after he designed the Congregational Chapel in Tackett-street, and the chapel in Crown-street and Museum-street, which led to the Lion-walk Chapel at Colchester, and others at Stowmarket, Halstead, Sudbury, Braintree, Nayland, and Tiptree, and several smaller chapels in neighbouring villages. In 1862 Mr. Barnes designed for a church and parsonage at Birkley Four, Kent, was selected in a limited competition with four London architects. At the same time he was engaged upon additional classrooms at Harrow School and in erecting boarding-houses for some of the Harrow masters, and a mansion for Mr. Charles Buxton, of Foxwarren, Surrey. In 1868 he designed the Ipswich Public Hall, the buildings in Westgate-street, and the improvements in the Butter Market. He also erected some dozens of schools before the operation of the School Board, and many parsonages and churches, including the New Church at Melton, and the Presbyterian Church at Ipswich, the tower of St. Lawrence Church (in conjunction with Mr. Howard Gaye) and many private houses in the eastern counties. He designed for the late Sir Richard Wallace, Bart., M.P., the Park Lodges and other ornamental buildings, including the rebuilding of Sudbourne Church, besides erecting and rearranging several farmhouses and home-stands on Sir Richard's estate at Sudbourne. It is now some years since Mr. Barnes was actively engaged in his profession.—*Eastern Daily Press.*

**CONSTITUTIONAL CLUB, NEAR EGHAM.**—A Constitutional Club for Englefield Green, Egham, was opened on the 1st inst. The premises, which are situated at Harvest Corner-road, have been built by Mr. Rowland, of Englefield Green, from designs by Mr. W. Menzies.

## GENERAL BUILDING NEWS.

**CHRIST CHURCH, NORTH BRINGTON.**—The foundation-stone of the new Christ Church, North Brington, was laid on Tuesday by Princess Christian. The architect of the church is Mr. Beresford Pite, and the building will seat 1,200 persons. A description and an illustration of the church appeared in our issue of June 27, 1896.

**PARISH CHURCH, HUTCHESONTOWN, GLASGOW.**—The memorial stone of the new Hutchesontown Parish Church, which is being erected at the north-west corner of Rose-street and Rutherglen-road, was laid on the 3rd inst. The church is to be seated for 950 people. There is also a hall alongside the church. The main entrance faces Rutherglen-road, and there are to be two side entrances. There is a tower at the west end of the main entrance, but there will be no spire. The architect is Mr. Alexander Adam, Glasgow.

**CHURCH RESTORATION, BRIGHAM.**—The reopening services in connexion with the lower parish church, at Brigham, in Berkshire, took place on the 7th inst. The restoration has been undertaken in part. The first was effected in 1868, when the chancel was built. Other portions have been executed since at a cost of about 8,000l. The present contract, by Messrs. Yeo, of Torquay, of about 800l., embraced a new nave roof. The outer part of the roof of the chancel and Organ-loft has been set on foot, and a site upon the main road has been secured. The screen and gates done away with, and the sides draped. The work has been carried out under the direction of Mr. Micklethwaite.

**PROPOSED NEW CHURCH, RETFORD.**—A scheme for the erection of a new church for the population of South Retford in Oxfordshire has been set on foot, and a site upon the main road has been secured. Mr. C. Hodgson Fowler, F.S.A., of Durham, has prepared a ground plan of a permanent church, which he estimates will cost 6,800l. This is for a church of brick with stone dressings. Another 1,000l. will probably suffice to provide a large room at the rear to be used for Sunday school purposes, parish meetings, &c.

**UNION CHAPEL, DEANSHANGER, NORTHAMPTONSHIRE.**—The newly-erected Union Chapel at Deanshanger has just been opened. The new building has been erected by Mr. A. P. Hawtin, builder, of Northampton, from designs by Mr. J. Coker, of Wolverton, and is built of red brick with white stone dressings.

**CHURCH FOR THE FREE CHURCH SECESSIONISTS, INVERNESS.**—The trustees of the Inverness congregation of the Free Presbyterian Church have purchased the plot of ground at North Church-place, in front of the old Free North Church buildings, with the view of erecting a church. The site is a central one, and the new church is designed to accommodate 700 persons. Messrs. Ross & Macbeth, architects, have been instructed to prepare plans.

**BLOOMFIELD NEW PRESBYTERIAN CHURCH, BIRMINGHAM.**—This new building, an illustration of which appeared in our issue of November 10, is situated near Bloomfield Railway Station. For various reasons only a portion of the scheme has been proceeded with at present. The buildings are of Scabro sandstone, with red Dumfries sandstone dressings. Westmoreland green slates are used for the roofing. The main entrance to the church will face the Beersbridge-road, and when completed will show an arched front to the vestibules and porches, over which will rise the main gable, with a large window with stone mullions and traceried head. A further door for exit purposes is placed under the tower and spire, which will rise to a height of 125 ft. The inside length of the present erection is 64 ft., and the width 30 ft.; this space is divided into a central area, with aisles at each side, by columns, which support the gallery front, and are further continued to support the arched wall, on which the roof principals rest. At present the church will seat 750 persons. The choir is placed on a slightly raised platform in front of the pulpit. The gallery front is of wrought iron in panels. At the rear of the church is a large vestry, minister's porch, and cloak-room. The future extensions at this end will consist of the lecture-hall. On the ground floor class-room and library accommodation will be provided, while the upper floor will be the large lecture-hall, with open timber roof. The artificial lighting of the church is by gas. The heating and ventilation arrangements have been carried out by Mr. A. Whittam, of Bloomfield. The building contract has been carried out by Mr. John Killen, from the plans and under the superintendence of Messrs. J. J. Phillips & Son, architects. The entire cost of the building will be 4,500l.

**TECHNICAL SCHOOLS, BARROW.**—At the monthly meeting of the Barrow Town Council, on the 5th inst., discussion took place with reference to the report of the Technical Instruction Committee regarding the proposal to erect new technical schools at a cost of 10,000l. The report stated that the schools of various towns had been visited, and

they recommended the carrying out of the plans of Messrs. Woodhouse & Willoughby, the building to be of Rumbon and Accrington red brick, with golden buff terra-cotta dressings.

**CATHOLIC SCHOOL, CHESTERFIELD.**—A new Catholic school has been erected at Chesterfield. The school adjoins the other school, on the ground at the rear of the church in Spencer-street. The architect was Mr. Ashmore, and the builder Mr. Wright, of Barlow.

**BANK, MORLEY.**—A bank building is now being erected in Queen-street, Morley, by Messrs. C. Murgatroyd & Sons, of Idle, in the French Renaissance style, from the designs of Mr. W. Bakewell, Leeds, for the London and Yorkshire Banking Company. It is a four and five storied building, of Aberdeen polished granite up to the window sills of the ground floor, and Morley Howley Park stone above. In the basement is the strong room; on the ground floor is the main room of the bank, 30 ft. by 22 ft., with mosaic floor, laid on concrete. On the first floor is the manager's residence, containing dining and drawing room and study, with overhanging and balcony windows, with all necessary on the second floor. There are eight offices, and the whole of the premises will be lighted by electricity, fitted with electric bells, and heated with low-pressure hot water. There are two staircases.

**MODEL LODGING-HOUSE, CARLISLE.**—The foundation-stone of the model lodging-house of Drovers-lane, built at the north-east corner of Drovers-lane by the Carlisle Lodging-house Company, was laid recently. The site originally covered an area of 745 superficial yards, ninety-five of which the Corporation have agreed to purchase to make Drovers-lane a 30-ft. street. In the basement is the caretaker's house, comprising kitchen, scullery, and two bedrooms; laundry, with all necessary washing and drying apparatus; lavatory and bath accommodation; clothes washing and drying rooms for the inmates; and a store. The ground floor, with an entrance from Drovers-lane, comprises entrance hall, retail shops and ticket office, kitchen, where the inmates will be allowed to prepare and cook their own food, and dining hall fitted with private lockers. There are also five lock-up shops with basements, fronting into Lowther-street. The first floor, approached by a stone staircase, comprises recreation-room and dormitory, with thirty-two cubicles fitted with bed and box-seat complete. There are also three sets of lavatories and two blanket stores on this floor. The second floor, approached by a stone staircase, consists of a dormitory with thirty-two cubicles, and a smaller dormitory with twenty crib beds, also three sets of lavatories and two blanket stores. Externally, the building will be faced with Cumwhinton bricks and white stone dressings, the piers to shops and the frontage to Drovers-lane being built in rusticated courses up to the first-floor level, and the whole will be relieved with pilasters, moulded brick jambs, and cornices. Internally, the walls of the entrance hall and staircase will be faced with white bricks, while the dining hall, kitchen, recreation-room, and dormitories will be faced with local red bricks. The floors over the basement and shops will be of concrete. The contractors employed to carry out the work under the supervision of the architect, Mr. H. Higginson, are:—Messrs. J. & R. Bell, builders; J. H. Reed, joiner; C. H. Bray, ironworker; W. Anderson, plumber; J. Hewison, slater; S. Ferriar & Son, plasterers; W. N. Ballantine, painter; T. Bedford & Co., laundry fittings.

**MUSIC HALL BUILDINGS, ABERDEEN.**—Various improvements have just been carried out at these buildings from designs by Mr. A. Marshall Mackenzie, A.R.S.A., architect, Aberdeen. There has been introduced a flight of Sicilian marble steps leading from the outer to the inner vestibules, and these vestibules and the main corridor have been floored with mosaic Terrazzo. The works above mentioned were executed by Messrs. James Bannochie & Sons, Aberdeen. The ball-room has also been redecorated by Mr. John Williamson, decorator, Aberdeen.

**BRANCH BANK AT SEAHAM HAIRBOW.**—The North-Eastern Banking Company have opened a branch at Seaham Harbour. A block of premises in Church-street has been transformed into bank premises, from plans prepared by Messrs. Milburn, architects, Sunderland.

**COTTAGE HOSPITAL, ELTHAM.**—On the 3rd inst. was opened the new Cottage Hospital erected by inhabitants of Eltham and Motingham, in commemoration of the Queen's recent Jubilee. The hospital, designed on the pavilion system by Mr. A. B. Hutchinson, comprises two principal wards for ten patients, two private wards, bath-room, and corridors.

**RAILWAY INSTITUTE, BANGOR.**—This institute was opened on the 7th inst. The reading-room, or large hall, is 50 ft. by 28 ft., with a platform at the end, 10 ft. wide. The reading-room is heated with hot water pipes on the high pressure system, and is ventilated by air inlets built into the walls, with one of Boyles' extractors in the roof. There is a store-room underneath. Between the library and the committee-room is a flight of steps leading to the baths, gymnasium, and refreshment-room. The gymnasium is 30 ft. long, and varies in width from 12 ft. to 18 ft. The whole of the work has been executed by the railway company's staff, from the designs and under the direction of Mr. W. Dawson, the railway company's engineer at Bangor.

\* A view of the interior was published in the *Builder* of March 15, 1894.



**TECHNICAL INSTITUTE, CONSETT.**—The foundation stones of the Technical Institute for Consett were laid on the 1st inst. The estimated cost of the buildings is about 5,000l. The architect is Mr. C. E. Oliver, and the contract has been let to Messrs. John Marshall & Son, of Hawick. The Institute will occupy a site at the north end of the town, facing Park-road and adjoining the public park. The building is set back 16 ft. from the road, and will be enclosed by a wrought-iron palisade. The general design of the structure is Renaissance. The exterior walls are faced with red pressed brick and Prudham stone dressings. The principal entrance has a deeply-recessed arched doorway, and leads through a vestibule, with stained-glass screen, into the entrance hall, from which direct access is obtained to the whole of the ground-floor rooms. Right and left of the entrance are ladies and gentlemen's retiring rooms, with lavatory accommodation. Immediately opposite is the secretary's or headmaster's room, with store room adjoining. On the left of the hall are two class rooms, each 22 ft. by 20 ft., divided by sliding glazed screens, to permit of their conversion into one large room when required; and on the right of the hall is the physics laboratory, 28 ft. by 20 ft., with class room, 16 ft. by 20 ft., adjoining. The staircase hall is lighted by a circular-headed window, fitted with tinted glass. The staircase is of polished blue Robin Hood stone, with wrought-iron balustrading and oak handrail. The corridors are of fireproof construction. The first floor consists of a chemical laboratory, 34 ft. by 20 ft. 6 in., with store room, balance room, and preparation room; lecture room, 32 ft. by 16 ft.; class room, 28 ft. by 20 ft. 6 in.; and art room, 42 ft. by 16 ft. The second floor, which has been designed with the view of being adapted for use as an art room, with store room, clerk's room, &c., in the future, will at the outset be utilised as caretaker's apartments. Detached from the main building is a room 47 ft. by 16 ft., to be devoted to the teaching of manual instruction.

**PARISH HALL, FAZELEY, STAFFORDSHIRE.**—A new Parish Hall has been erected at Fazeley. The architects are Messrs. Wright & Tomlinson, Derby. The hall is a structure of red brick, with terra-cotta dressings. It contains a library, reading and recreation room, Parish Council chamber, and committee-room; also an assembly-hall which will accommodate nearly 500 persons. The builder was Mr. R. Kershaw, Burton-on-Trent.

**Y.M.C.A. BUILDINGS, BIRKENHEAD.**—On the 9th inst. the new junior building at the Birkenhead Young Men's Christian Association was opened. The new building, which has been erected by Mr. J. H. Jackson, Birkenhead, from the plans of Mr. John Clarke, has an exterior of Ruabon brick, with stone and terra-cotta dressings. The entrance is from Oliver-street, through a hall into reading and recreation rooms, cloak-rooms, and lavatories. There is a hall on the second floor, with a platform, and various small rooms.

**HOTEL FOR BUXTON.**—Over fifty men are now employed getting out the foundations for the new hotel to be erected on a site in the Peak, Buxton, for Spiers & Pond, Limited. The land, eight and a half acres in extent, has been purchased from the Duke of Devonshire for 6,000l., and the building alone will entail an outlay of 125,000l. It is to accommodate about 300 guests, and is to be completed by the year 1900. The architects are Messrs. Bodley & Garner, of London.—*Sheffield Telegraph.*

**PROPOSED NEW LIBRARY, LIVERPOOL.**—On the 6th inst., at the Municipal Buildings, Major-General H. Darley Crozier, R.E., the inspector appointed by the Local Government Board, held an inquiry into the application of the Liverpool Corporation for consent to the appropriation of the sum of 17,500l. out of the proceeds of the sale of corporate property, in defraying the costs of the provision of a public library for the south end of Liverpool. Mr. Shelmorine, City Surveyor, explained the plans of the proposed building, which would stand upon about 1,350 square yards of land.

**WOLVERHAMPTON'S NEW WORKHOUSE.**—At the meeting of Wolverhampton Board of Guardians on the 9th inst., the New Workhouse Committee reported that they had had several interviews with the architect, Mr. Marshall, of Nottingham, as to the alterations in his plans for the new workhouse, suggested by Mr. Aldwinckle, the assessor. Mr. Marshall had altered the plans to carry out the committee's suggestions and recommendations, and the plans so altered had been approved by the committee, who recommended the Board to adopt them, and instruct the Clerk to forward them to the Local Government Board for approval. By these alterations the estimated cost of building the workhouse is reduced by 12,003l., leaving the net estimated cost at 117,670l. The committee reported that they had also considered the question as to the quantities, and recommended that Mr. Marshall be employed to take out the quantities at a fee of 1 per cent. on the total amount of the builder's or contractor's accepted tender. The Chairman gave notice that he would move the adoption of the report next week.

**PAROCHIAL HALL, NORWICH.**—The new hall in St. Stephen's-square, which has just been built to serve the purposes of St. Stephen's parish, was opened on the 9th inst. The dimensions of the hall are 60 ft. by 30 ft., and its material is brick, with stone dressings. The principal entrance is from the

square, and at the other end there is another entrance communicating with Crook's-place. The main entrance is by way of a vestibule, on the left of which is a platform which serves as a vestry. At the Crook's-place entrance there are kitchens and lavatories, and above these there is a large classroom. In the basement is a heating chamber. The architect is Mr. J. B. Pearce.

**THEATRE FOR FINSBURY PARK.**—A site has been purchased at Finsbury Park for a new theatre. Messrs. Murray & Foster, of the Adelphi, are the architects of the proposed building.

**INFIRMARY NURSES' HOME, WANDSWORTH.**—The foundation-stone of the new nurses' home in connection with the Infirmary of the Wandsworth and Clapham Union, on St. John's Hill, has just been laid. The new home for the accommodation of the nurses of the infirmary is being erected on the northern portion of the infirmary grounds. The principal approach is by means of an open covered way from the main corridor of the ground floor of the infirmary wards. Access to the building can also be obtained from the terrace at the northern end of the wards. The building will provide accommodation for seventy-five nurses in separate rooms, apartments for the assistant matron and for the principal night nurse. A large recreation room for the general use of the nurses is placed close to the entrance hall, and adjoining the same is a separate sitting-room for the accommodation of thirty sisters; adjacent to these two rooms is lavatory and cloak-room accommodation. Leading from the entrance hall is a corridor, on either side of which the bedrooms for the nurses are arranged, and a stone staircase placed centrally in the length of the building gives access to each of the respective floors (four in all), having corridors right and left of the same extending the full length of the building. Sanitary and bath-room accommodation is provided in a central portion on each floor, and there is a lift for boxes, coal, &c., running the full height of the building. Two separate external fire escape staircases are provided in convenient positions. The nurses' bedrooms, store-rooms for linen, bedding, &c., are provided. The night nurses' bedrooms are to be placed upon the top floor. The warming to the corridors and supplemental heating to the recreation-room, &c., is by means of hot-water radiators. The contractors for the building are Messrs. Gregory & Co., of Clapham Junction, and it is being carried out from the designs and under the supervision of Messrs. Lansell & Harrison, of London.

**NEW NURSES' HOME, LEEDS INFIRMARY.**—On the 12th inst. a new nurses' home was opened at the Leeds General Infirmary on the elevated ground at the rear of the hospital. The structure is of three stories, with basement and two frontages to Thoresby-street and Sunning Bank-street. The material is red brick relieved with stone dressings from the Morley quarries. Accommodation is provided in the new home for fifty-two nurses, each having a separate room. On the ground floor of the east wing, with a southern aspect, are two day-rooms—one for the sisters and the other for the nurses—and also a writing-room. On the north side is the recreation-room, 30 ft. by 25 ft., and not far off is a small visitors' room and a small kitchen. In the courtyard at the back is a bicycle shed, with stalls for thirty-two machines. The rooms and corridors are lighted at night with the electric light. The heating is effected by low-pressure hot-water pipes and radiators. All the bedrooms are cross-ventilated by means of air inlets in the outside walls, with valves under control, and hinged flaps over the doors opening upon the corridors. Fresh warmed air is also introduced. In the principal day rooms the vitiated air is extracted by automatic ventilators and extraction flues. All the sanitary fittings are of glazed ware. The architect of the building is Mr. W. H. Thorp, and the building has been erected under his supervision by Mr. J. Gould. The clerk of the works was Mr. J. Graham.

**CLERGY AND CHOIR STALLS, TWYVWELL, NORTHAMPTON.**—In memory of the Rev. Horace Waller, late Rector of Twywell, clergy and choir stalls and a tablet have been placed in Twywell Church. The work was carried out by Messrs. Hay & Hems & Sons, of Exeter, under the superintendence of Mr. J. C. Traylen, Stamford, the architect.

#### SANITARY AND ENGINEERING NEWS.

**BRIDGE, SHEFFIELD.**—A new bridge is being built over the Don at Ball-street, to take the place of the old footbridge. The bridge will also provide a means of communication between the two districts of Shalesmoor and Neepsend. The dilapidated state of the old iron footbridge was frequently brought before the notice of the City Council up to a short time ago, and the City Surveyor (Mr. C. F. Wike) on being instructed to examine it, found the ironwork being instructed to examine it, found the ironwork and advised the committee to close it. It was in three spans, and was only 10 ft. wide, and representations as to the desirability of having a wide bridge had been made for a considerable time. The Council decided to build such a bridge, and at the same time, to widen Ball-street on the Shalesmoor side. A quantity of old house property has been purchased on the side of the street opposite

Messrs. Dixon's works, and the width of the street will be increased from 21 ft. to 40 ft. Unfortunately, the whole of the street cannot be so improved. For the last 100 ft. the approach to the bridge will remain at its present breadth, but, apart from this, there will be a good road, 40 ft. wide, both on the bridge and on each side of it. The design submitted by Mr. Wike, and accepted by the Council, is for an iron bridge of an ornamental and substantial character. The river here is about 200 ft. wide, and the bridge will rest on two central piers and an abutment on each bank. There will thus be three spans, each about 70 ft. long. They will be arched, and the segments of the arches fastened with buckle plates. From each pier will rise a heavy stone pier, the top of which will be nearly 15 ft. above the water line. From the crown of the arch to the waterway the space will be 6 ft. 6 in. The balustrades will be of open iron work, running the whole length of the bridge, except where interrupted by the stone piers. The bridge will be paved with wood, and there will be a footpath on each side, with a roadway 24 ft. wide between. Messrs. Brathwaite & Co., of Leeds, are the contractors.—*Sheffield Telegraph.*

**PROPOSED NEW SEA WALL, HERNE BAY.**—A Local Government Board inquiry was held at Herne Bay on the 10th inst., on the application of the Town Council for a loan of 40,000l. required for the renewal of the sea-wall and parade, which were damaged in the gale in November of last year. It was explained by Mr. Baldwin, Latham, civil engineer, that the new sea wall would be 1,024 yds. long and 20 ft. to 25 ft. high, being so constructed that it would allow of the promenade being widened 15 ft.

**DRURY LANE THEATRE.** The application of electrical power for moving stage machinery was first advocated before the Society of Arts by Mr. Edwin O. Sachs, and further dealt with in his book on "Stage Construction." The first manager to seriously take up the matter is Mr. Arthur Collins, who, after inspecting the various hydraulic stages of the Continent, agreed that electrical power would be more practical and economic for English purposes, and had designs for a modernised stage prepared by Mr. Sachs. The difficulties as regards the supply of current were overcome by arrangement with the Charing Cross Company; whilst the contractors selected for the somewhat difficult pioneer work were the Thames Ironworks Company, who took up the matter more for the credit of the thing than for profit. The first part of the work relates to the stage floor, which is divided into six sections, some on two of which (i.e., on the two central ones). The first sections to be worked by electricity were the fifth and sixth, i.e., those most distant from the auditorium. These are the sections completed up to date. They have been principally constructed by night, or at odd moments during the run of the autumn drama. Each section measures 40 ft. by 7 ft. 6 in., and forms an independent whole. The idea is to raise the stage floor above the stage to the extent of 12 ft., or to lower below it to the extent of 8 ft., for the purposes of scenic effect, without incurring a working expenditure exceeding a shilling per performance, and at a capital outlay of not more than half of that of a hydraulic installation. The waits for building up scenery are to be avoided, the staff of unskilled labour on the stage to be reduced to a minimum. Transformations by open scenes are to be made possible without any special effort beyond the attendance of an electrician at the switch-board. By a combination of sections working at different levels the most varied effects can be obtained, and it is of course possible to couple two or more sections together for a specific purpose. Each section of the stage now takes the form of a platform resting on a lattice work "bridge," the "bridge" being suspended by wire cables, part of the weight being taken up by counterweights, whilst the difference and any load is moved by a winding gear driven by an electric motor. The weights that have to be dealt with in the form of live loads are varied from four tons to two tons; whilst the dead load necessary to obtain the stability requisite to carry galloping cavalry, four-in-hand coaches, &c., is six tons. Two-thirds of this dead load is taken up by the counterweights referred to. The power of the motor may be defined as 7½ h.p.; the maximum rate of movement on a vertical rise of 20 ft. one minute. The value of the current for any one movement of, say, 10 ft. may be taken as a penny.

#### STAINED GLASS AND DECORATION.

**WINDOW, ST. GEORGE'S CHURCH, CANNES.**—In remembrance of the late Lady Glenesk, a memorial window, which has just been completed by Messrs. James Powell & Sons, will be erected at St. George's Church, Cannes. Mr. James Powell designed and superintended the work.

**MEMORIAL BRASS, LLANDAFF.**—The memorial brass to the memory of the late Archdeacon Griffiths, to be placed in Llandaff Cathedral, has just been completed from the designs of Mr. C. B. Fowler, architect, Card. n. The design is Celtic in character, the outline being adapted from ancient manuscripts and the ornamental work from the pre-Norman crosses and memorial stones of South



Wales. The brass, which measures some 3 ft. in height and 2 ft. 6 in. in breadth, has at its head a medallion of the late child, and below are a few biographical details of his career. The work has been carried out by Mr. John Williams, Cardiff.

### FOREIGN.

**FRANCE.**—The Société Centrale des Architectes has re-arranged their official staff for the coming year. M. Alfred Normand, member of the Institute, has been elected President.—The suppression of the Paris fortifications between the Point du Jour and the Porte de Saint Ouen seems to be nearly determined on, and it is said that the State are going to sell the military zone to the City of Paris for the sum of 135,550,000 francs.—In the spring the interior works for the Salle des Séances of the Chambre des Députés will be begun, and it is expected they will be finished by the middle of 1900. The present hall will be transformed into a Salle de Conférences, and as an annex to the Bibliothèque des Députés.—A monument is to be erected to the memory of Balthus, the architect, who built the Halles Centrales and the Church of Saint Augustin.—The first cupola of the small palace of the Champs Elysées has just been finished. The second cupola is well advanced, and the side ribs are being placed in position. The Pont Alexandre II. will soon be sufficiently advanced to receive the groups destined for it.—The Mairie of Saint Mandé has just opened a competition for the building of some schools.—The "Société des Amis des Arts" of Angers are going to erect a monument in the courtyard of the museum to the memory of the painter Leneuvre. This monument, the plan of which has been designed by M. Marcel Lambert, architect, will be ornamented with a bust by M. Injalbert, and with a bas relief by M. Roty.—The Diéppe Chamber of Commerce has appropriated the sum of four million francs for the object of improving the entrance into the port, and of protecting the canal from the silting up of shingle. The works will much improve the port, and will facilitate communication with England.—A monument in honour of the brothers Joseph and Xavier de Mestre is to be erected in the Place du Château, at Chambéry, facing the Fontaine des Elephants. This monument is to be inaugurated in June.—M. Emile Bernier, architect of the Opera Comique, has been promoted "Officier" of the Legion of Honour.—The death is announced of the artist Louis Marold, author of some pretty illustrations for the works of Alphonse Daudet, of Pierre Loti, and André Theuriot.—M. Brouch, architect, Paris, has just died at the age of seventy-eight.—The death is also announced of M. Le Cardonnel, architect to the City of Paris, at the age of twenty-nine.

### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—Mr. R. Stephen Ayling, architect, has removed from Parliament Mansions, Victoria-street, to 19, Old Queen-street, Westminster.—Messrs. Sheath Bros., India-rubber and Gutta Percha manufacturers have removed to 87, City-road, E.C.—The Horsfall Furnace Syndicate, of Leeds, manufacturers of refuse destructors and forced-draught boiler furnaces, have opened a London office at 36, Great George-street, Westminster, under the charge of Mr. Somerset Butler.

**THE PAINTERS COMPANY.**—This Company is offering a Travelling Studentship of the value of 50l. for the encouragement of the study of Decoration. It is open to competition on terms which may be obtained from the Clerk to the Company.

**THE LONDON HOSPITAL.**—The governors of the hospital will promote a bill next session to enable them to acquire some leasehold interests or reversions in certain property of which they are freeholders, consisting of Nos. 13 to 23 (odd) in Oxford-street, Whitechapel, and of land forming the site of John Baker's almshouses, lying next westwards, to a garden leased by them to the Brewers' Company, in order that they may erect thereon additional buildings for the purposes of the hospital. On June 26, 1891, was opened the new block, containing an operating-theatre, a theatre for clinical instruction, nurses' rooms, store rooms, &c., after the designs of the plans of Mr. Rowland Phipps. In 1813 John Baker gave 2,500l., a cottage, and 31 acres of land at Mill Hill, Horton, and 6,000l. Reduced Three per Cent. stock, in trust to the Brewers' Company, as endowment (after deduction of certain small payments) for six almshouses, with clothing and allowances for six poor women of the parish of Christ Church, Middlesex. According to some returns made by the Company nineteen years ago the income of Baker's Trust amounted to 600l. 8s. 10d., of which 271l. was expended upon the almshouses and their inmates.

**"SIMPSON'S" CHESAPEIDE.**—The old "Queen's Arms" tavern, in Bird-in-hand-court, Chesapeake, has just been re-built as "Simpson's" from Mr. Elphick's plans and designs. It stands at the south end of the little court at No. 76, Chesapeake, referred to in our columns of October 22 and November 19, in the matter of Hobbs, Hart, & Co. v. Grover. Charles Cowden Clarke records that Keats, when a medical student, lived, in 1816-7, with his brother in

lodgings in a house over the passage leading to the "Queen's Arms"; he there wrote the greater part of his first volume of poems. The passage, Bird-in-hand-court, passes beneath the first floor of the house, No. 76, Chesapeake, which, however, was rebuilt thirty years ago.

**LONDON COUNTY COUNCIL.**—By their "General Powers" Bill for next Session the Council propose to (1) dissolve and reconstitute the River Lea Conservancy Board, and provide for the nomination of members of the new Board by the Council, the Corporations of the City and West Ham, and the County Councils of Middlesex, Essex, Bedford, and Herts; (2) purchase, for purposes of the Metropolitan Fire Brigade Acts, the following sites:—Nos. 61 to 71 (odd), Chatham-road, Battersea; Nos. 38 to 41, Pickering-place, and Nos. 7 to 10, Pickering-mews, Westbourne-grove; No. 138, Maida-vale (Kilburn Priory site); Nos. 139 to 145 (odd), Burdett-road, Mile End Old Town; Nos. 69 and 69a, Euston-square, and 174, Euston-road, with a plot of ground adjoining; and to enlarge the stations in Old Kent-road and Bethnal Green; (3) enlarge their gas-meter testing station, Westminster; and (4) take, for an open space, the Brickfield, Limehouse. The Council also propose to acquire by agreement the freehold interest in the site of Spitalfields Market; to add to Tooting Common a portion of Hyde Farm, now belonging to Emmanuel College, Cambridge, in which college they will give certain lands of Tooting Bee Common in exchange; to provide for contributions by the Brickfield, County Council, the Vestries of St. John, Hampstead, St. Pancras, Finsbury, and St. Marylebone towards the purchase of the Golders Hill Estate, Hampstead Heath; an extension of time in respect of works now in progress at Highgate Archway, Knightsbridge (widening of St. George's-place), and Hackney Marshes (purchase of the "Hick" property); and to obtain further powers to enable them to enter upon lands and buildings situated within certain "improvement areas" for the purpose of survey and valuation, to enter upon and survey and value at any time lands shown on the deposited plans, and to obtain information as to value and ownership.

The SANITARY INSTITUTE, held in London, on December 2 and 3, six candidates presented themselves. Mr. W. Ord, Hanwell, was granted a certificate in practical sanitary science. At an examination for inspectors of nuisances, held in London, on December 2 and 3, 128 candidates presented themselves, of whom seventy-four were certified, as regards their sanitary knowledge, competent to discharge the duties of inspectors of nuisances.

**THE LONDON SCHOOL BOARD AND BUILDING CONTRACTS.**—At the meeting of the London School Board on Thursday last week, a point was raised by Mr. G. C. Whiteley, chairman of the General Purposes Committee, on a claim by a certain firm for increased payment on account of a rise in wages since the completion of their contract. The rule of the Board is that where the London scale of wages should apply the contractors shall pay to the workmen employed by them the rates of wages mutually agreed upon by the Central Association of Master Builders and the representatives of the unions of the various branches of the building trades, which agreed rates of wages are invariably set out in the schedule attached to the contract. Obviously such a condition of contract cuts both ways. It appears that after the commencement of the works contracted for by this firm, a general and official rise in wages took place in the building trade by agreement between the employers and representatives of the trade unions. The Board at first refused to entertain the claim for extra payment, but the committee consented to allow the case to go to arbitration.

—Daily Chronicle.

**THE ILLUMINATING POWER OF ACETYLENE.**—Professor Vivian B. Lewes delivered his concluding Cantor lecture on "Acetylene," at the Society of Arts, on the 12th inst. This lecture was devoted to the consideration of the relative values of the various types of acetylene burner, and of the value of acetylene when mixed with other gases. The lecturer pointed out that the statement commonly made that the illuminating value of acetylene is fifteen times as great as that of coal gas is misleading; for, although it is true that under certain conditions it is possible to obtain an equivalent of nearly 240 candles per 5 cubic feet of acetylene consumed per hour, yet in practice these conditions are never obtained. He had examined a large number of burners of all varieties, and found that the average illuminating value obtained was about thirty-two candles per cubic foot of acetylene. Moreover, these comparisons are made upon the arbitrary standard of sixteen candles per five cubic feet of coal gas per hour, whereas, if the coal gas is burnt in an incandescent gas-light burner fitted with a good mantle, instead of in a standard Argand burner, it is possible to obtain a yield of over eighteen candles per cubic foot of coal gas. Referring to the gradual choking of the minute holes in acetylene burners through the deposition of carbonaceous matter, Professor Lewes said that he considered this deposition to be due to the decomposition and subsequent decomposition in the burner of small quantities of benzene. The modern forms of burner, constructed on the same principle as the Napier burner, do not become blocked so rapidly as the earlier forms of burner, but the

difficulty has not yet been entirely overcome. Professor Lewes thought that a mixture of acetylene with a cheap diluent, such as methane, which would allow the acetylene to exert its full proportional enriching value, would be extensively used in the future; and mentioned that already compressed oil gas mixed with from 20 to 25 per cent. of acetylene was largely used, especially in Germany, for the lighting of railway carriages.

**INSTITUTE OF ARCHITECTS' MEETING.**—By an error in reporting, Mr. Solomon was made to say, in our report of his speech in the discussion at the Institute in our last issue, that the flooring of certain American buildings "was mostly iron- $\frac{1}{2}$ -in. thick." It should have been "the flooring boards were mostly  $\frac{1}{2}$ -in. thick."

**BACK-TO-BACK HOUSES, LEEDS.**—A deputation from the Leeds Corporation was, according to the *Leeds Mercury*, to have had an interview on the 13th inst. with representatives of the Local Government Board, in order if possible to induce them to allow the erection of back-to-back houses in the York-street area for the accommodation of tenants who are displaced by the demolition of slum property in that locality. This subject was discussed at a recent meeting of the City Council, when a resolution was passed approving of the erection of back-to-back houses. The Corporation are bound by law to provide a certain number of dwellings for those they destroy. They would like to build through houses, but the capital cost, it is stated, would be so great that they could not let such dwellings at anything like the low rentals which the tenants about to be turned out have been in the habit of paying. Further, the majority of the members of the Corporation are strongly opposed to the erection of tenement buildings, believing such a system does not tend to the quietude, comfort, or happiness of home life. Their only solution of the question, they believe, lies in the construction of healthy back-to-back houses, which it is said can be erected at a cost that will permit of them being let at comparatively small rentals. The Corporation recognise, however, that the Local Government Board of late years have not looked with a kindly eye upon back-to-back houses—in fact, that they have passed a by-law prohibiting them. It is with a view of obtaining some relaxation of this general rule to enable the Corporation to build "modern" back-to-back houses that the deputation was appointed.

### CAPITAL AND LABOUR.

**THE SUNDERLAND SLATERS' STRIKE.**—The Sunderland slaters, who have been on strike for an advance of wages for three weeks, resumed work on the 9th inst. They sought an increase of 1d. per hour, to bring their remuneration from 9d. to 10d. per hour, but they have agreed with the masters to an advance of a halfpenny per hour, pending the further consideration of their application by the North of England branch of the Master Slaters' Association.

**WAGES IN THE BIRMINGHAM BUILDING TRADE.**—The workmen engaged in all but one of the different branches of the building trade in Birmingham made an application to the employers twelve months ago for an increase of wages. At the expiration of the six months' notice a halfpenny per hour was conceded, and the increase came into operation on April 1 last. The branch which did not participate in the increase was that of the bricklayers, but now they have applied for an advance, and it is considered probable that a concession of a halfpenny per hour will be made to them in April next. It is said, however, that some difficulty may arise as a result of the employers wishing to alter certain of the rules regulating the trade with respect to the employment of apprentices and the payment for work which is compulsorily done at night. It is doubtful whether the men will approve of the suggested alterations in the rules.—*Birmingham Post*.

### LEGAL.

**INFRINGEMENT OF ANCIENT LIGHTS AT ST. JOHN'S WOOD.**  
MANDATORY INJUNCTION GRANTED.

MR. JUSTICE KEKEWICH, in the Chancery Division, on the 7th inst., disposed of the case of Clifford v. Holt & Sons and others, which was an action by the plaintiff, the lessee and occupier of Manor Lodge, 2, Grove-end-road, St. John's Wood, for an injunction to restrain Messrs. Holt & Sons, builders, and the Duke of Buccleuch, Messrs. R. Broughton, W. Nicholson, V. E. Walker, and the Earl of Londesborough, the trustees of the Marylebone Cricket Club, from obstructing the plaintiff's ancient light, and particularly the light to his greenhouse, by the new tennis and racquet court now in course of erection on Lord's Cricket Ground. It appeared that the back of the tennis court, about 30 ft. high, was, as the plaintiff alleged, built on the party wall on one side of the garden, and had been raised to such a height as to obstruct the necessary access of light to his greenhouse. It seemed that part of the building had been erected partly on the garden of the adjoining house, 3, Grove-end, which had been purchased by the defendants. The plaintiff alleged



that he had previously enjoyed the access of plenty of light for his garden, greenhouse, and premises. The defendants contended that the light obstructed was trifling and unimportant, because there was ample light coming to the plaintiff's premises from the other points of the compass. The defendants admitted that the lights of the greenhouse were ancient lights.

Mr. Justice Kekewick held that the greenhouse was a "building" within Section 3 of the prescription Act, and that there had been a material obstruction of light by what the defendants had done. The evidence, said his Lordship, established that there had been a diminution of light of which the plaintiff was entitled to complain, as it was clear he could not get a convenient light elsewhere. He was of opinion that the plaintiff was entitled to a mandatory injunction to restrain the access of light to the greenhouse, but the injunction would be suspended for three weeks to enable the defendants to appeal within the three weeks then the injunction would be extended until the appeal was disposed of. His Lordship awarded the plaintiff the nominal sum of 5s. for the trespass and gave him the costs of the action.

Mr. Warrington, Q.C., and Mr. P. F. Wheeler, appeared for the plaintiff; and Mr. Renshaw, Q.C., and Mr. Melhuish for the defendant; Mr. A. O'Connor held a watching brief on behalf of the reversioner.

#### ACTION FOR INJURY TO A WALL AT BARKING.

THE case of Jones v. The Barking Urban District Council came before the Court of Appeal, composed of Lords Justices A. L. Smith, Rigby, and Collins, on the 8th inst., on the appeal of the plaintiff from the decision of a Divisional Court in favour of the defendants. The action in question was brought to recover damages for injury to a wall belonging to the plaintiff by the overflow from a sewer. It appeared that the plaintiff was the owner of certain houses in Loxford-road, Barking, at the bottom of which ran a brook and a sewer which was vested in the defendants, and ran along Loxford-road, having a dead end next the brook. In consequence of a heavy fall of rain which occurred in May, 1897, the storm-water filled the sewer and forced the water up a branch drain, flooded the plaintiff's land and washed away part of his wall which separated the land upon which his houses were, from the brook. In 1896 there had been a previous overflow, and the wall was damaged and complaint was then made to the defendants, and since then the defendants had put in storm-openers in their sewers. The plaintiff contended that the defendants were negligent in not keeping the sewer in a proper condition, under Sections 15 and 16 of the Public Health Act, 1875, by reason of their not having storm-openers therein. The jury, in the Romford County Court, found that the defendants were not negligent in not having sufficient sewers to carry off the sewage; that the overflow arose from an extraordinary storm, which overflow could have been relieved by ordinary care, and that the defendants should, in 1896, after the accident, have had storm-openers put in the sewer. Upon these findings the County Court Judge entered judgment for the plaintiff for the amount claimed, but the Divisional Court, on the defendants' appeal, entered judgment for the defendants. The plaintiff now appealed.

At the conclusion of the arguments of counsel their Lordships affirmed the decision of the Divisional Court and dismissed the appeal with costs.

#### THE LONDON COUNTY COUNCIL AND THE FACTORY AND WORKSHOP ACT, 1891.

DISPUTE AS TO LIABILITY UNDER COVENANTS IN A LEASE.

THE case of Arding and Others v. The Economic Printing and Publishing Company came on the 12th inst. before the Court of Appeal on the appeal of the plaintiffs from the judgment of a Divisional Court of Queen's Bench giving judgment for the defendants reversing the judgment of the Judge of the City of London Court, who gave judgment for the plaintiffs. It appeared that the plaintiffs were the statutory "owners" of a factory in Boulevard street, Fleet-street, and the defendants were their tenants under a lease bearing date October 30, 1891, for a term of twenty-one years from December 25, 1891, terminable, at the option of the lessees, at the expiration of seven or fourteen years at a rent of 700l. a year. The London County Council compelled the plaintiffs as such owners of the factory under Section 7 (2) of the Factory and Workshop Act, 1891, to provide in the factory means of escape from fire at a cost of 700l., and the present action was brought to recover that sum from the defendants under the lease, which contained covenants on the lessee's part that they would during the term bear, pay, and discharge all rates and taxes assessed or charged upon the premises, and also bear and pay a fair share of all costs and expenses which the plaintiffs during the continuance of the term might be called upon to bear or pay from any separation, pulling down, rebuilding, or raising of any party wall, party fence wall, timber partition, or party arch, or incidental thereto,

or in or about any drainage or sewerage at any time made under any Act of Parliament during the continuance of the term. The plaintiffs contended that they were entitled to recover the whole sum, under the first of these covenants, while the defendants contended that the expenses came within the second of the covenants, and that they (the defendants) were only liable for a proportion of the expenses. The Judge of the City of London Court gave judgment for the plaintiffs for the full amount under the first covenant. The Divisional Court, on appeal of the defendants, reversed this decision, and held that the words of the covenant were not sufficiently explicit to cover this exceptional charge created by a recent Act. Hence the present appeal of the plaintiffs.

At the conclusion of the arguments of counsel their Lordships affirmed the decision of the Divisional Court, and dismissed the appeal with costs.

#### THE CORPORATION OF SOUTH SHIELDS AND STREET WORKS.

THE case of Donaldson v. The South Shields Corporation came before Mr. Justice North, in the Chancery Division, on the 8th inst., on a motion by the plaintiff to restrain the defendants from proceeding with steps to take, under compulsory power, property abutting upon the intended frontage of a street the Corporation was widening under their private Act of 1895, which empowered them to make several improvements. The question to be decided was whether the defendants were entitled, in addition to the land actually required for widening a street, to take land adjoining and re-sell it at a profit, and so recoup themselves part of the expense of carrying out the authorised street works. The defendants gave the plaintiff notice to take premises belonging to her, which were delineated in the Parliamentary plans, and described in the book of reference which had been deposited, in accordance with standing orders, previously to the passing of the defendant's Act of 1895. The property in question abutted on the line of frontage of Fowler-street as intended to be widened, under the powers of the Act, but was outside the limits of deviation for the widening of the street itself.

In the result, Mr. Justice North held that on the particular words of the Act the Corporation were not entitled to take land outside the limits of deviation, and granted the injunction as asked.

#### EMPLOYERS' LIABILITY CASE.

HALL v. VEITCH.

AT the Newcastle County Court, on the 12th inst., his Honour Judge Greenwell had before him the case of Hall v. Veitch. The plaintiff, Mr. John Hall, a joiner, brought an action against Mr. Robert Veitch, builder, to recover damages under the Employers' Liability Act for injuries sustained by falling from a scaffold at the Erskine Presbyterian Church, Rye Hill, in March last, in consequence, he alleged, of the defective plant. His Honour heard the action, and found that the plant was not defective, and gave judgment for the defendant. Another action was now brought, in which the plaintiff claimed damages on the ground of negligent superintendence on the part of the defendant's servants in not having warned him, on the morning of the accident, that the scaffold was in process of demolition, and was therefore unsafe. This action was heard before a jury. Mr. Joel, instructed by Messrs. Dix, Warlow, & Hall, was for plaintiff; and Mr. Meynell, instructed by Messrs. Mather & Dickinson, was for defendants.

The plaintiff, John Milligan, Wm. Dixon, Joe Smart, Nicholas Maughan, and Mr. Farrer gave evidence, four of them repeating practically the evidence given by them in the original action, and at the conclusion

Mr. Meynell submitted there was no evidence of negligence against either of the defendant's servants.

Mr. Joel submitted that there was a case to be answered.

His Honour was inclined to the opinion held by Mr. Meynell, but he should take the opinion of the jury upon the matter, reserving to himself his right to say what should be done. If he was of opinion afterwards that there was no evidence, he should act upon that opinion.

His Honour, in summing up to the jury, said he could see no evidence to show negligence on the part of the defendant's servants, but it was for the jury to say, and they must not be satisfied with mere suspicion on their part.

The jury found for the defendant, and his Honour said he entirely agreed with the verdict.

Judgment was accordingly given for the defendant with costs.

#### MEETINGS.

FRIDAY, DECEMBER 16.

Architectural Association: Discussion Section.—Mr. S. W. Cranfield on "Buildings for Secondary and Technical Education." 7 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. Walter Daniel on "The Kentish Town Widening, Midland Railway." 8 p.m.

Crystal Palace School of Practical Engineering.—Announcement of List of Certificates awarded by the Examiners. 12 noon.

Glasgow and West of Scotland Technical College: Architectural Craftsmen's Society.—(1) Mr. H. H. Butler, on "The Number of Members in the Association shall be increased by the addition thereto of seven hundred (700) members beyond the present registered number." 8 p.m.

SATURDAY, DECEMBER 17.

Sanitary Inspectors' Association.—(1) General Meeting at 6 p.m., when a Paper will be read by Mr. W. H. Grigg. (2) An Extraordinary General Meeting at 8 p.m., when the following resolution will be submitted on behalf of the Council:—That the number of members in the Association shall be increased by the addition thereto of seven hundred (700) members beyond the present registered number.

Perth Architectural Association.—The drawings submitted in competition by the Design Class of the Association for last session will be exhibited within the lecture-room of the Natural Science Society, Tay-street. Also a collection of drawings and sketches lent by Mr. Robert J. Gildard, Edinburgh (late Vice-President of the Association), and others.

MONDAY, DECEMBER 19.

Royal Institute of British Architects.—(1) Mr. H. R. J. Burstell on "The Application of Electric Power to Practical Purposes in Buildings." (2) Mr. Bernard M. Drake on "Some Practical Hints on the Production and Use of Electricity for Lighting Country Houses." 8 p.m.

London Institution.—Mr. W. J. Russell, F.R.S., on "How to Produce a Picture on a Photographic Plate in the Dark," illustrated. 5 p.m.

Liverpool Architectural Society.—Mr. Talbot Kelly on "Saracenic Architecture," with limelight illustrations. 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. F. W. Belford on "Sienna and Baldassare Peruzzi," illustrated. 6.30 p.m.

British Society of Architects.—Business Meeting: Revision of By-laws and suggestions for generally improving the Society.

Northern Architectural Association.—Rev. D. H. S. Cranage, M.A., "A Cistercian Abbey." 7.30 p.m.

TUESDAY, DECEMBER 20.

Institution of Civil Engineers.—(1) Paper to be further discussed: "The Ventilation of Tunnels and Buildings," by Mr. Francis Fox. (2-time permitting) Mr. John Handley Dales on "High-speed Engines." 8 p.m. Special General Meeting (of Corporate Members) at 9 p.m. to consider, and, if approved, enact a Supplemental By-law.

WEDNESDAY, DECEMBER 21.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Society.—Annual business meeting. 8 p.m.

THURSDAY, DECEMBER 22.

Carpenters' Hall (London W'all).—Distribution of prizes by his Grace the Duke of Fife, K.T. 8.30 p.m.

Institution of Electrical Engineers.—The discussion on Dr. Lodge's paper on "Improvements in Magnetic Space Telegraphy," and on Mr. Evershed's paper, will be opened by Dr. Fleming and Mr. Preece, with experimental demonstrations. 8 p.m.

Edinburgh Architectural Society.—Annual dinner.

#### RECENT PATENTS:

ABSTRACTS OF ACCEPTED SPECIFICATIONS.

Open to opposition until January 23.

[1897] 23,843.—WOODEN MANTELS: J. Parker.—In development of his patent No. 12,854 of 1896 for interchangeable jambs, the inventor has arranged the upper part of the jamb-bracket with a moulding from which projects an overhanging surface bored with clearance holes, on each of the jambs is secured a bracket to carry the overhanging moulding, the brace-board is secured to the back of the jamb, and the shelf is secured by wood-screws passing through the clearance holes; by another method, for the overhanging moulding is substituted a securing piece attached within the box-jamb-bracket so as to connect the latter with the face of the securing piece slightly lower than the finished upper face of the bracket, the securing piece being provided with grooves or slinkets to be bored with clearance holes.

26,626.—DRAIN-TESTING APPARATUS: Laura Sheppard.—This consists of a tube or hollow case, from 17 in. to 20 in. long, to hold smoke cases or drain testers. The case has an air-tight cap on one end and a tapered screw cap on the other end, the latter being a continuation of a smaller tube connecting with an india-rubber or similar tube soft enough to bend through a drain trap. On pulling a wire connected with a spring cap at the end of the flexible tube, the smoke is forced into the drain, and a wire around the tube prevents it from becoming flattened when forced through the trap.

27,524.—WATER-RESISTING PASTE-GUM OR COATING: L. Bussey, H. Philippe, & P. Bussy.—The material is obtained by dissolving celluloid (say, 200 parts), or softening it with acetic acid (1,000 parts), with alcohol (400 parts), and adding a mineral or organic salts, or similar substance (400 parts).

27,566.—HIGH PRESSURE WATER COCKS: J. Whitfield.—The cock is formed by applying a leather auxiliary cone-shaped valve or wicket, similar to an inverted cup, upon the valve spindle above the ordinary valve seat. The greater the pressure of water against the valve or cup, the greater will be its expansion, and the resistance dispenses from the stuffing-box and screw threads in connexion with the valve spindle.

28,174.—ROPE TIGHTENING LEVERS: D. J. Campbell.—The claim is for a base plate having therein a segmental slot that approximately extends from a vertical line drawn to the centre on which the slot is described to a point at an angle from the line of about 90 deg., a lever working upon a fulcrum concentrically with the slot, a lug projecting from the lever into the slot, and a rope-knotter attached to the lever; the invention's object is to enable one to tie the knot in an instant and to give the rope an equally as possible by hand and the knot has been tied.

28,348.—BALL AND FLOAT VALVES: W. Obee.—The float-valve is attached to the vessel to be fed by pipes at top and bottom of the vessel, and is so placed that, rising or falling fluid, acting upon a float attached to a lever, closes



352.	By MOSS & JAMESON.	240
	Sheerness, Kent.—Mile Town, &c., f.g. rents	
	88 <i>l</i> . 1 <i>7</i> s. 2 <i>d</i> ., subject to various leases, most of	
	which are renewable on a fine of 7 yrs. g.r. for	
	each life re-stated . . . . .	3,500
	By ALFRED RICHARDS (at Tottenham).	
	Stamford Hill.—3 <i>a</i> , The Crescent, ut. 8 <i>o</i> yrs.,	
	<i>c.</i> 6 <i>l</i> . . . . .	180
	Tottenham.—7, 10, and 12, Gothic-villas, L. r.	
	<i>c.</i> 4 <i>l</i> . 5 <i>s</i> . . . . .	



[illegible]









## ILLUSTRATIONS.

New Town Hall, Colchester.—Mr. J. Belcher, F.R.I.B.A., Architect .....	Double-Page Ink-Photo.
Colchester Town Hall: Details of Tower.—Mr. J. Belcher, F.R.I.B.A., Architect .....	Double-Page Ink-Photo.
Design for Stained Glass: "Angels Appearing to the Shepherds."—By Mr. Arthur L. Duthie .....	Single-Page Ink-Photo.
Design for Mosaic in Dome, Greek Church, Bayswater.—By Mr. A. G. Walker .....	Single-Page Ink-Photo.
Three Houses, Hampstead.—Mr. Horace Field, Architect .....	Single-Page Photo-Litho.
Design for Memorial Cross and Drinking Fountain, Town's Green, Chorley.—By L. Rycroft-Oakes .....	Single-Page Photo-Litho.

## Blocks in Text.

Plan of Colston's Hall as Existing .....	Page 574	East End of Chapel, St. Stephen's Church, Devonport .....	Page 585
--	----------	---	----------

## CONTENTS.

Concert-rooms and the Colston's Hall Competition .....	573	Mosaic Decoration, Greek Church, Bayswater .....	584	Diaries, &c., for 1896 .....	586
Electricity at Home .....	575	Three Houses, Lynnhurst Gardens .....	584	The Decoration of St. Paul's .....	587
Notes .....	576	Memorial Cross on a Drinking Fountain .....	574	Clerks of Works and their Salaries .....	587
The Royal Institute of British Architects .....	578	Sanitary Inspectors' Association .....	584	The Student's Column.—Sound, Light, and Heat.—XXV.—	587
Proposed Lodge on Space Telegraphy .....	580	Contestants .....	584	XXVI. .....	588
The Architectural Association .....	580	Architectural Societies .....	584	General Building News .....	589
The Architectural Association Discussion Section .....	580	Engineering Societies .....	584	Sanitary and Engineering News .....	590
St. Stephen's Church, Devonport .....	583	Royal Institute of Architects of Ireland .....	585	Foreign .....	590
The London County Council .....	586	Metropolitan Asylums Board .....	585	Miscellaneous .....	591
New Town Hall, Colchester .....	584	Court of Common Council .....	585	Capital and Labour .....	592
The Tower, Colchester Town Hall .....	584	Huddersfield Master Builders .....	585	Legal .....	592
Design for Stained Glass .....	584	Books Received .....	586	Meetings .....	593

### Concert-rooms and the Colston's Hall Competition.



HE competition for "the restoration and improvement of Colston's Hall," Bristol, has some special interest, on account of the celebrity of the building, the unfortunate and curious fate by which it was

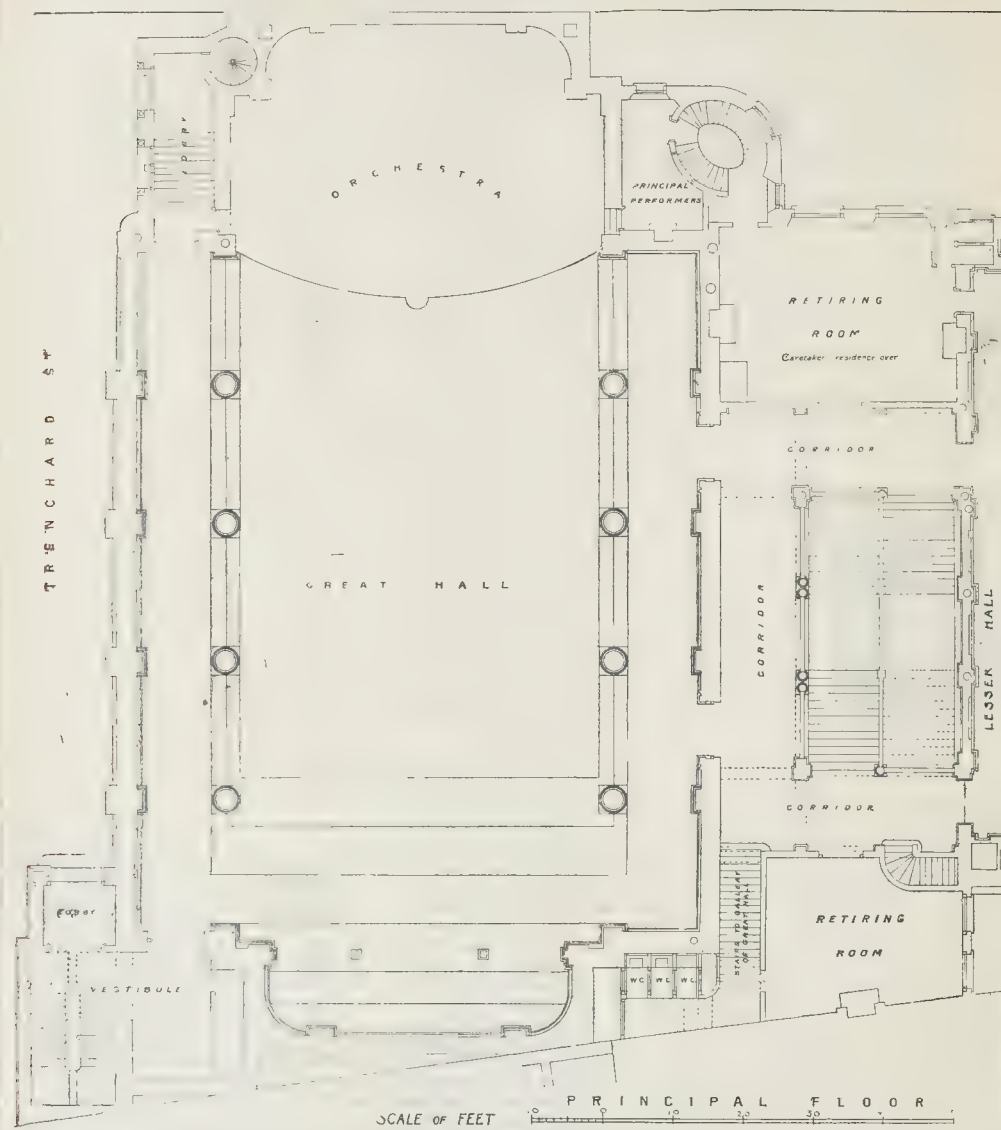
burned out in the very midst of a week's series of important meetings, and the chance which seemed to be afforded of making a considerable advance on the usual conventional planning of orchestra and organ, as the instructions to architects implied that in this respect the Colston's Hall Company were at all events ambitious. Unfortunately this latter expectation has been entirely disappointed.

It must be admitted, in the first instance, that the company set the competing architects an all but impossible task. The plan on the next page, reduced from a portion of one of the plans supplied to competitors, shows the lines of the hall as now existing. The roof, floors, orchestra, &c., were entirely burned away. The outer walls still stand, and the columns, though the latter are very much damaged—the courses twisted and the stone cracked with the heat; and it is evident that they at all events must come down. We presume that it has been ascertained by a careful survey that the outer walls are in a safe condition, as it seems to be implied that they are to be retained. The main entrance is on the east side of the hall, through a large lobby under what is called "the Lesser Hall," only the margin of which is included in the plan as here given. This portion of the building was not touched by the fire, which was confined within the walls of the large hall, and the fairly handsome main staircase remains just as it stood.

In the present day, every time a new concert-room is built, it is desired to make it larger than its principal predecessor in the town. St. James's Hall was much larger than the Hanover-square Rooms, and the Queen's Hall is again much larger than St. James's Hall. The peculiarity in the case of Colston's Hall is that the boundary walls are

there and are to be retained, and "any encroachment beyond the limitations of the site" was to disqualify a competitor. Now from the best inquiries we could make, we cannot find that the hall ever held more than about 2,300 persons in the audience when packed its fullest, but the Company now want to get within the same walls "an audience of some 3,000 or 4,000 persons," as it is vaguely put; at all events a considerably larger number than are ever known to have been in the hall before. Added to this, they want to provide for a band of 100 and a chorus of 300, which is we imagine a larger number than were ever accommodated on the old orchestra. They also wish for "a position to be reserved for a full-sized organ"; what exactly they mean by that equally vague phrase it is not easy to define, but if it means an instrument possessing all the important stops that should be found in the largest class of concert organ, they must have a very inadequate idea of the space required for such an erection, and it is obvious that most of the competitors know as little about this as the Company. Having thus invited the architects to squeeze into both the auditorium and orchestra more persons than have been accommodated there before, within the same walls, they add the further demand that space should be left, and arrangements made, by which 200 to 300 additional performers can occasionally be assembled. The hall is also to be re-roofed and entirely re-decorated, a good system of warming and ventilation established, and the retiring rooms for performers remodelled and improved in arrangement. And all this they expect to have done for 10,000*l.* To do it at all adequately would cost at least 20,000*l.*

In regard to the space for the audience, of course all the competitors gain something on the ground floor area by removing the columns, the space outside which was before rather lost ground, and continuing the seating nearly to the wall, leaving only the narrowest possible passage. The intimation that the hall is to be adapted for use for such purposes as banquets and balls, as well as for concerts, of course renders a flat floor a necessity, and puts aside the consideration of an "isacoustic curve" in the section of the seating. Messrs. Jones & Cummings (London), the authors of the first premiated design (No. 2), adopt the dimensions of the old orchestra, and one can see at a glance, almost, that they have not room for the band and chorus demanded; even allowing the chorus the close fit of 1 ft. 4 in. per seat, there is only room for 292 on the seats behind the band; and a band of 100 would occupy more than the space allotted to the band in front; there is not room there for more than seventy, or eighty at the outside. Architects, in planning orchestras, forget (or do not know) how much space is required for the manipulation of some of the instruments, and for the standing room for the instruments themselves; the string basses are very bulky instruments, and require plenty of room for their manipulation; the kettledrums alone take up the standing room of about six people, and the bass-drum (when used) of another four. There are some extra seats for chorus in a gallery on each side of the organ; whether these are meant to make up the ordinary number or to provide for the additional "200 or 300" we do not know; if the latter, they are too few; if the former, these singers would be under the greatest disadvantage in attempting to keep in with the main body of voices below them and with each other, as they are shut out from both sight and sound of each other by the organ. That is another of the mistakes constantly made in planning orchestras; people seem to think that as long as they get enough seats for a specified number of singers it is all right, and they thrust portions of them back into inlets or bays on each side of an organ; whereas part of the facility for keeping both in time and in tune depends on all the chorus being well massed together and all able to hear each other. The provision for the organ, considering that a "full-sized" one is demanded, is absurd; it is bracketted out from the wall over the heads of the chorus, and is only 28 ft. high altogether; so where is a 32-ft. pipe to come, letting alone the necessary space occupied at the lower portion by wind-chest and action? It would be interesting to know, also, whether the authors of the design have any idea of the weight to be carried in an organ even of the size they have shown, and how they propose to hang it securely to a single thickness of blank outer wall, with no opportunity of taking cantilevers back to an adequate bearing. The organist, as usual in these cases,



Plan of Colston's Hall as existing.

is placed right under the organ, where he could not hear the least what was the effect of his playing in combination with the band and chorus, and all the competitors but one have done the same; the authors of the third premiated design having actually put the organ-player *inside* the lower portion of the organ-case, with three round holes for him to hear what is going on, but where it would be impossible for him even to see the conductor. The fact that nowadays an organ key-board can be placed at any distance from the organ, by the aid of electrical action, has been so much talked about and advertised that one would think all architects ought to have heard of it; and at all events any competent conductor or organ-player could tell them that it is of the greatest consequence, particularly when an organ has to accompany a band

and chorus, to bring the player out to the front of the orchestra, so that he can really know what he is doing and how to proportion his instrument to the general effect. This is a musical rather than an architectural question, no doubt; but surely, if an architect is planning a concert room, it should be a matter of common-sense to get some information from musicians as to their requirements. We may add, by the way, that there is no indication of where the organ bellows are to go—unless the authors think they can corbel those out from the wall also.

The first premiated plans have no doubt been selected mainly on account of the good arrangement of the accessory rooms and staircases, &c., to which much thought has evidently been given. We observe, however, that the band-room, under the orchestra, is lighted by windows in the back wall where,

we were locally informed, there is either no light or no right of light. But the unfortunate band are badly treated in most of the plans, and while the superior *artistes* revel in fairly-lighted rooms, the band are left to any available hole in the basement, generally without daylight. The authors of this design have rebuilt the main stairs, placing the flights at right angles to instead of parallel to the larger axis of the hall; this is no doubt an improvement, but considering the 10,000*l.* limit, it might have seemed wiser to accept the present staircase. Warm-air ducts are shown in various places on the plan, but the drawings do not explain the system of ventilation, and the architects' Reports have not been affixed to their drawings, so that we have no information as to their intentions. Wherever there is an exhibition of competition drawings the



reports sent with each set of plans should be affixed to them; not to do so is exceedingly unfair to the authors of the designs, who are thus precluded from giving an explanation which may be necessary for the right understanding of the drawings. The design indicated in the longitudinal section is in good taste, but suggests nothing more; it is commonplace. The authors have not availed themselves of the permission to include a perspective view of the interior as proposed.

The authors of the second premiated design (No. 10), Messrs. Lanchester, Stewart, & Rickards, have on the other hand sent a beautiful interior view of the hall as they propose it, which is in fact the only first-class architectural drawing in the room. The design consists of an order of pilasters with a strongly marked cornice over it, over which is a large cove with Welsh vaults breaking into it over the semi-circular beaded windows; round the orchestra the line of the cove is carried on by a deep decorated frieze. The whole effect architecturally would be admirable. The orchestra is no larger than in the first design, the band space especially being most inadequate; and the chorus seats go back into recesses on each side of the organ (which here rises from the orchestra steps), an arrangement which, as before explained, is very unsatisfactory. The room for the organ bellows in the basement is indicated in this set of drawings. The organist is placed almost under the organ, as before. If the *artists'* corridor at the back of the orchestra (half way up) is intended to have the rooms for ladies and gentlemen opening out of it, as appears to be the case, within a few feet of each, we should hardly call that a desirable arrangement. The rooms for band and chorus below seem to be almost destitute of light; but it must be admitted that in taking the existing walls as they stand the difficulty of dealing with this portion of the plan is almost insuperable. There is a sliding out platform in front intended, we presume, to provide for extra numbers, but it would be very inadequate for what is demanded. It would appear that many of the competitors have taken the Queen's Hall orchestra as their model, no doubt regarding it as the last new concert room; but, whatever other merits the Queen's Hall has, the orchestra is one of the most inadequate and worst planned to be found in any large concert-room; larger than necessary for a band alone, too small for an adequate band and chorus combined; and architects had better be warned against taking it as a precedent. Indications are shown on the drawings of a system of mechanical ventilation, without which no large public hall can really be properly ventilated. We may add that in this design the architects appear, as far as the drawing shows, to have contemplated retaining the existing main staircase.

The third premium has been given to the set numbered 39, by Messrs. G. C. Laurence and Harold Smith. There is more attempt in this plan to provide adequate room for band and chorus; the orchestra front is brought further out into the room; the seats are arranged in a more circular form, which is better for the chorus hearing each other, but not so good for the audience hearing them. The entrances for the performers are here made by *vomitoria* in the midst of the orchestra. The principal staircase is rather

well treated; a broad straight flight first, and then two flights of half the width, going off in quadrants right and left. The chorus waiting and refreshment rooms are pretty well provided for, but there is nothing for the band save a "store-room" in the basement. The absurd position in which the organ-player is placed has been already referred to. The design, as shown in the perspective view, is sensible and suitable, though a little commonplace; the main ceiling flat and deeply coffered (which is good for breaking up echo), with a large cant at the angles; the coffered treatment is repeated on the ceiling under the gallery. The organ-case is shown sufficiently high in exterior appearance, but then the lower portion is the "cave" in which the player is placed, and the upper portion goes out of the room behind the main cove of the ceiling.


Not many among the other plans call for special notice. No. 3 has realised what space would actually be required for the band and chorus demanded, and has obtained it by pulling down the west wall of the existing orchestra bay and rebuilding it in a line with the main wall of the hall, getting a much wider orchestra with the chorus in unbroken lines across, and not cut up or divided by any obstacles. Whether this would put him out of court, as going "beyond the limitations of site," we do not quite gather from the terms of the Instructions. The plan is obviously a very expensive one, and the elliptical form of the roof is not good; it is likely to make echo. No. 16 gives room enough for the band, but the chorus goes back into caverns at each side. No. 18, in a pretty interior sketch, actually shows a colonnade between the band and the chorus. No. 25 is noticeable for the fact that, without meddling with the existing walls, he has recognised the fact that the existing orchestra bay cannot be adequate for the numbers required, and has made a wide and spacious orchestra on the east side of the hall, turning the audience round at a right angle with the long axis of the building; he gives ample room for the band, but still has not sufficient for the chorus; this however is a clever plan, and a spirited attempt to meet an almost insuperable difficulty. This competitor also is the only one who has put the organ keyboard where it ought to be—in front of the orchestra and near the conductor's desk. No. 23 is the only one who has realised what space is required for the "full-sized" organ; but this naturally does not leave him enough room for band and chorus. No. 35 has achieved a large enough orchestra by taking down both side walls of the orchestra bay and carrying on the line of the main walls of the hall; and this is the only way, in fact, in which it can be done. Retaining the present orchestra bay renders it hopeless to provide for the numbers asked for. The organ is carried across the whole width in the rear, and is wide enough, but not high enough.

In the main, however, the competition is a total failure, partly because the demands are such as cannot adequately be fulfilled, partly because scarcely any of the competitors appear to understand the placing and providing for organ, chorus, and band. On this head we may make one suggestion which, as far as we know, has never been exemplified in practice viz.: that it is very desirable to have a definite line of demarcation between chorus and band, and to arrange this so that the band, while being heard as well as

possible by the audience, should be a little veiled from the chorus. As it is, in most cases where band and chorus are crowded as close as they can be, one sees some instruments invading the chorus portion of the seats. Now it is very distracting to chorus singers to have a trombone, for instance, in full blast close to their ears, playing something quite different to what they are singing. The band ought to be placed on the lower steps with a sound-board beneath it, rising up into a fairly high partition, above the heads of the highest rank of players, behind which partition the lowest rank of the chorus would stand; and these two portions of the orchestra should have separate entrances. The sound of the band would thus be concentrated and thrown forward into the room, and at the same time a little modified to the chorus singers, who would not have the instruments right in their ears as they often have now, nor instrumentalists mixed up with them in a haphazard fashion. In fact, both band and chorus would gain by such an arrangement.\*

We should recommend the Colston's Hall Company to recognise the fact that this competition has been a failure, and could not have been otherwise, and act accordingly. We have all to pay for our experience sometimes; the Company have paid for theirs. They had better rest content with paying over the premiums to the three competitors, put the plans on one side, and then remove the ruins of the old Hall, and advertise a competition for an entirely new building of adequate dimensions and with an orchestra planned on the best principle, and such as will avoid the mistakes and absurdities seen in so many executed concert-rooms, and in most of the plans submitted in this competition.

#### ELECTRICITY AT HOME.

 THE two papers on electricity read before the Royal Institute of British Architects on Monday night, although they advance nothing very startling or novel, yet, coming as they do from electricians who have had such a wide experience in their respective spheres, are worthy of close attention by architects. Both papers are very conveniently subdivided under various headings, and will be useful for reference. The paper by Mr. Bernard Drake on "Some Practical Hints on the Production and Use of Electricity for Lighting Country Houses" mentions many points often neglected in the management of the electric lighting of a house which, when attended to, lead to greater economy and a more restful illumination. For example, when lamps are placed against walls it is better to shade them only in front, and so obtain the full advantage of the reflection of the wall. An eight-candle power lamp under these circumstances produces a better illumination than a sixteen-candle power lamp shaded all round. Mr. Drake showed a very striking experiment, proving conclusively that a frosted glow-lamp produced a better illumination than a clear lamp of the same candle power as measured by a photometer. Each of the lamps was placed in a box open at the top and covered with dark green cloth inside.

\* This arrangement was suggested, and a section given of an orchestra constructed in this manner, in a paper on the subject read before the Institute of Architects many years ago by the present Editor of this journal.

The boxes were placed side by side and the light switched on. To the eye the frosted lamp appeared much the brighter, as the light, being better diffused, did not dazzle the eye and lead to contraction of the iris, thus limiting the rays which reach the retina. Another point we were glad Mr. Drake laid stress on was the necessity of having two-way switches in passages and staircases fixed in such positions that the necessity of traversing any part of the building in the dark will be avoided. Specimens of artistic electric fittings were shown to the meeting, and we were struck by a method of lighting a dinner-table with electric candles without the necessity of piercing the table-cloth or the carpet. It was effective, although, perhaps, it reminded one a little too much of a conjuror's arrangement. Mr. Drake showed in the lantern some very interesting and instructive photographs, taken by the electric light, of rooms and picture galleries in historic mansions to illustrate his methods. In the adapting of the candle fittings already in existence he was particularly successful, as the electric candles produced almost the precise effect of wax candles. He perhaps dwelt too strongly on the advantages obtained by employing a combined shelf and picture rail, containing a row of hidden lamps for electric light, and on the effects produced by small lamps concealed in the overmantel and in china cabinets. As was pointed out in the subsequent discussion, the theatrical and unnatural effects, however clever and mysterious, sometimes produced in this way are by no means satisfactory to the architectural mind.

The second paper, by Mr. Burstall, was on "Practical Applications of Electrical Power." After dealing with the principles underlying the application of electrical power, he described a few typical apparatus, and then discussed the question of cost. The methods he gave of obviating the troubles caused by the hum of the motor and the noise of the fan in ventilating, accentuated, as these often are, by the air shaft acting as a resonator, are worth special notice. Most interest, however, was aroused by his remarks on electric heating. Many forms of electric radiators are open to the same objections as hot-water pipes. Heating a room by merely warming the air in it is a dull and tedious method. To live in a room, also, full of warm air produces an enervated feeling. The new Dowsing electric radiator shown and explained to the meeting completely gets over these objections. A group of four thick filament lamps run at a lower voltage than would be used for electric lighting are put in front of metallic reflectors, which throw a beam of heat rays out into the room. The effect produced is almost that of a cheerful coal fire, and the eye rests on it with pleasure. Each of the lamps can be turned off independently, so that the heat can be regulated. The particular radiator shown was suitable for heating a small room, and with electricity at fourpence a unit (a maximum price for electricity used for heating purposes) each lamp would cost a penny per hour. The lamps being run at a low voltage will probably last many thousand hours. The radiator is more ingenious than it appears to be at first sight, as, when we saw it a year or two ago, great difficulty was experienced in preventing the glass from

melting. This difficulty was overcome by arranging so that a current of cold air flows through the stove. Excellent toast can also be made in front of this stove. In the opinion of several of those who spoke there was a great future for electric heating, as the absolute cleanliness of electric stoves gives them a great advantage over coal fires in flats, there being no coal and ashes to carry about.

#### NOTES.

**An Employers' Parliamentary Council.** A BODY called the Employers' Parliamentary Council has, it appears, been formed for the purpose of watching over measures introduced into Parliament which affect "the interest of trade generally or of any industry in particular." This is a pretty large order, but nevertheless we think this body may do good work, not so much on the lines of working for the interests of employers as by causing both the principle and the form of Parliamentary Bills to be carefully considered. A measure good in principle may be so drafted as to have mischievous consequences—it may seem a trifling affair, and be passed through the House in the small hours of the morning, unless it has been examined and found wanting by a critical body. It is much better also that any measure which affects the interests of employers as a class should be thoroughly considered before it becomes law. A body such as that which has just now been incorporated will never stop a really sound measure from passing. It may be of use in pointing out weaknesses in principle or reform.

**A Timely Suggestion.** THE deputation from the Trade Union Congress Parliamentary Committee, who waited upon the President of the Board of Trade last week, had no reason to complain of their reception. Mr. Ritchie was as emphatic as they could desire as to the iniquity of victimising their railway members for "taking the advice of the Board of Trade" in approaching the directors for improvements in their conditions of service; and he promised that the strongest steps possible should be taken upon proof of anything of this kind having been done. But, having dealt with this and other grievances, Mr. Ritchie took the opportunity of tacking on to his reply a little wholesome caution and good advice; and of enforcing certain truths which would perhaps, be scarcely listened to in times of conflict. The deputation were reminded that this was the only great country which showed a decrease in exports upon a comparison of a number of years; and that they must not disguise from themselves, as representatives of Trades-Unions, that one of the chief reasons for this was to be found in the loss of trade directly attributable to strikes and lock-outs. Why not call an industrial conference to endeavour to secure industrial peace, asked Mr. Ritchie, with an allusion to the famous effort of the Tsar in the direction of international peace by similar means. Labour problems would be far more profitably and calmly discussed at such a Conference, than at a time when masters and men were in the throes of a bitter dispute. That the trades-unionists on their part recognise this, is evidenced by the fact that they subsequently resolved to thank Mr. Ritchie for his suggestion, and to request him to take steps to inaugurate such a conference.

**The Sinking of Venice.** THE reports about the state of the Ducal Palace are very contradictory and it seems impossible at present to get at the truth; but we should be afraid that the more unfavourable statements are the more likely to be true. It seems only too likely that a great many of the buildings of Venice, originally erected on rather unscientific piling in a foundation of very shifting material, are approaching the period when they cannot be expected to be secure much longer without extensive work being done in renewing and consolidating their foundations. Probably much of the pile foundations, if they could be examined, would be found to be rotting. One must hope for the best, but we cannot be surprised to hear of the dangerous state of this and other Venetian buildings. If this is the case, it is to be hoped something will be done before it is too late. The world would hardly seem the same if the Ducal Palace were gone.

**The Paris Exhibition.** SEVERAL important decisions have been made in regard to the pavilions which foreign Governments are to erect for their own displays at the Paris Exhibition. The Egyptian section will occupy a space of 2,500 square metres, divided into three distinct buildings. That on Rue de Magdebourg, next to the Trocadéro, is to be a reproduction of an ancient Egyptian temple. The second one is to represent an Arab bazaar; the third is to be a theatre in ancient Egyptian style. M. Marcel Dourgnon will be the architect for these buildings. The German Government has commissioned Herr Richter to design a pavilion in the German Renaissance style, with a large hall with open arcades in front. The English pavilion is to be a reproduction of Kingston House, Bradford-on-Avon; as an example, we presume of the old English residence. This will include private apartments for the use of the Prince of Wales when he is present as President of the English section. Except on those occasions, the building will be open to the public.

**Architects and Competition Committees.** WE have before referred to the unsatisfactory conditions of what was called Tavistock-road competition at Plymouth (see *Builder* July 16, page 52), for designs for a row of houses in that town. The action taken by the architects of Plymouth and the neighbourhood shows what effect may be produced if architects will act with unanimity in these matters. The architects in a body declined to compete unless a competent assessor was appointed, the premium raised, and other alterations made in the conditions. The Corporation consented to augment the premium and to appoint an assessor, but declined to modify other conditions which were objected to. They invited Mr. G. R. Crickmay to act as assessor; but he, finding some of the conditions of the competition objectionable, referred the matter to the Council of the Institute, who gave it as their opinion that he should decline to act. It is understood that the Corporation are still looking for an assessor, but it is probable that no member of the Institute will act until the conditions are altered, and the competition is thus at a deadlock. We have received this week a communication from the Bradford Society of Architects and Sur-



voyers, enclosing their letter to the Corporation of Bradford in regard to a Fire Brigade Station competition. In this case they have obtained an amendment of the terms of the competition in several important particulars, viz.: the payment for quantities over and above the 5 per cent. commission; the promise to employ the architect to whom the first premium shall be awarded; and the addition of a margin of 10 per cent. for the usual "tender from a contractor of standing" to carry out the building for the sum named in the conditions. They do not undertake to appoint an assessor, but consent to accept the nominee of the Institute of Architects if they find it necessary to do so; which is something gained. The moral of all this is that if architects will stand together in regard to the conditions of competitions they will be likely to get their own way in the end.

**Salford Cemetery Competition.** WE hear from a competitor that although designs were sent in for this competition in

August last, nothing has been heard of the result. At the end of October an inquiring competitor received the information from the Town Clerk that the drawings were still in his possession unopened, a dispute having arisen as to the suitability of the proposed site for a cemetery; and since then nothing more has been heard of them. The Corporation are bound in honour to select the best designs and pay the premiums, even if they abandon the scheme; why then do they not at least settle this point without further delay?

**Electric Trtraction at Hamburg.** THE Report of the deputation of the Salford Corporation on their visit of inspection to the Hamburg tramway system is worthy of commendation. Instead of entering into discussions and comparisons which are better left to experts, they have confined themselves to obtaining full particulars of the construction, mode of working, regulations, and financial results of this exceptionally complete and efficient tramway system. Although the Hamburg Tramway Company has to pay a tax to the State of 1/4d. for each passenger carried, as well as the usual rates on their properties, and although the fares are only at the rate of 1/4d. per mile, yet the company pays a dividend of 8 per cent. The State tax is an unpopular one, and discourages short-distance fares. All the cars have to provide 20 in. width of seat per passenger, which contrasts favourably with the 16 in. width allowed by English law. The Fire Brigade carry bridge rails for carrying cars over hose-pipe, and they are also provided with wire-cutters, rubber gloves, keys to electric cut-outs, &c. The Committee were impressed with the value of first-class car construction and polished wood finish as compared with cars finished with paint, which requires frequent costly renewal. In addition, they dwell on the importance of a good code of regulations and the value of really artistic metal work in the posts, brackets, and rosettes used for supporting the overhead wires, as compared with the shapeless and absolutely ugly structures used on some of the earlier electric tramways. We can congratulate the deputation on having made good use of their opportunities, and their Report ought to be of the greatest assistance to the Salford Corporation.

**Free Hydrated Lime in Portland Cement Mortar.** It is sometimes stated that the presence of free calcium hydroxide ( $\text{CaH}_2\text{O}_2$ ) in Portland cement mortar lessens the durability of the mortar; but in a paper recently published by Schuliatschenko it is shown that cement mortar exposed to the action of sea-water may contain much free hydrated lime and yet remain in good condition for a long period. Reference is made to the experiments of Emelianoff, who examined some samples of Portland cement concrete taken from the harbour works at Poti, after immersion for thirty years in the Black Sea, and found that the mortar was saturated with carbon dioxide on the surface only, and that the interior of the mass contained over 33 per cent. of free hydrated lime. Schuliatschenko also finds that the amount of free hydroxide in a cement mortar increases during its setting until the end of the second month, which, apparently, confirms the theory of Le Chatelier that the only silicate of lime that is capable of setting hard— $3\text{CaO} \cdot \text{SiO}_2$ —gradually decomposes under the influence of water into calcium hydroxide and monosilicate.

**Sanitary State of Bromwich.** DR. BUCHANAN'S Report to the Local Government Board, as to the recent action by the Town

Council of West Bromwich for the improvement of insanitary conditions there, shows that while there has been considerable improvement in some particulars, there has been rather a retrogression in others. He finds that since a reorganisation of the inspectorial staff at the end of 1896 inspection of premises has been carried out in more systematic fashion than formerly, and there has been more activity in dealing with houses unfit for habitation. On the other hand, there is at Mayers Green an area of nearly two acres, upon which are scattered in irregular fashion some fifty small houses, almost all of which, by reason of faulty construction, dilapidations, and bad position, are quite unfit for human habitation. The need for effecting improvement in this area has been pointed out in annual reports of the Medical Officer of Health, and the Town Council have made a beginning by purchasing one or two small properties comprised in this area. It is said, however, that their intention in the matter being known, owners are now demanding artificial prices for the remaining properties, and that for this reason purchase of further properties is unlikely. In the larger proportion of the premises dealt with by the Town Council during the period under review, owners have been required to amend faulty gutters in the yards of houses on their property, and to provide paving. The result in some cases has been satisfactory, but in a majority of premises dealt with the work appears still to be executed after a makeshift fashion, drainage being provided for by open brick channels, laid without regard to level, and with right-angled bends. In regard to the abolition of privy middens, the Town Council seem to have failed in one case to convince a magistrate that these were a nuisance, and have since followed a policy of endeavouring to avoid taking such cases into court, and the owner of a midden is offered the alternative of "improving" it. Thus it happens that against every property on which the owner has abolished privies

and provided water-closets must be set some two or three neighbouring properties upon which the privy middens have been recently "improved" at the instance of the Town Council, but which nevertheless remain almost as unwholesome as ever.

**The Physic Garden, Chelsea.** IN our "Note" of August 13 (pp. 147-8 ante) we gave a brief history of the garden, and stated that the Apothecaries' Company had applied to the Charity Commissioners for relief from their trusteeship. The Commissioners have framed a scheme for the administration of the Charity and its endowments, which consist of the garden (3½ acres) established by Sir Hans Sloane by an indenture dated February 28, 1721-2, with the curator's residence and other buildings, a yearly sum not exceeding 800*l.* for maintenance payable out of the income of the City Parochial Foundation (as set up by the Acts of 1883 and 1897) a yearly sum of not less than 150*l.* out of moneys voted by Parliament, and the subsidiary gifts of John Meeres (1726) and Mrs. Ann Rand (1757). The garden is to be maintained for promoting the study of botany with special regard to the requirements of (a) general education; (b) scientific instruction and research in systematic botany and vegetable physiology; and (c) instruction in technical pharmacology as it concerns the culture of medicinal plants; the scheme provides for the erection of new offices, lecture rooms, and a physiological laboratory, the appointments of a curator and a head gardener, the establishment of lectures upon botany, and the maintenance of collections of living plants for teaching purposes. The students and professional staff of the Royal College of Science are to be accorded free admission into the garden, with use of the collections, lecture rooms, and appliances, so long as the sum of 150*l.*, or more, shall be paid in that behalf to the Trustees of London Parochial Charities, as trustees of the re-modelled charity. The committee of management is to consist of fifteen persons, nominated by the London Parochial Charities' Trustees (eight), the Treasury, Royal Society, Society of Apothecaries, Pharmaceutical Society of Great Britain, and other public bodies (one apiece). The said trustees are empowered to contribute a sum, as yet undetermined, for equipment of the garden and for new buildings.

**A Remarkable Strike of Architects.** THE following paragraph has been sent to us by a correspondent in Siam, cut from a paper published for the English community at Bangkok:—

"The *Kobe Herald* has the following amusing version of a recent Reuter's telegram:—

**STRIKE OF ARCHITECTS IN PARIS**  
20,000 Troops Held in Readiness.

In Paris a strike of architects on a great scale has occurred. Last Saturday (8th) their number was 40,000, but to-day it has reached 60,000 perhaps."

We do not know where the *Kobe Herald* dates from. The statement evidently refers to the strike of artisans in Paris, as it became transmuted by the Eastern journalistic intellect.

**Puvis de Chavannes' Frieze for the Pantheon.** It has been announced in some of the Paris papers that the frieze by Puvis de Chavannes, which had been provisionally put up over



his paintings in the Panthéon, was to be heightened in colour and completed by some of his pupils, under the direction of M. Cazin; an announcement which caused some alarm. The scheme has however been abandoned, and the Government intend that the drawings of the frieze should be preserved in the Luxembourg in their present state.

At the Gallery of the Fine Art Society there is a collection of beautiful works, chiefly water colours, by Mr. Albert Goodwin. A large proportion of these are of more or less architectural subjects, views of cities, of Mont St. Michel, of a charming stone bridge on the Medway at Aylesford, of Notre Dame, Paris, by night, &c. Many of these views, no doubt, may be said to show the city or the building translated into a tone and effect of the artist's own, which is very delicate and charming, but a little unreal, as one must recognise when we find the prevailing tone in "Amalfi" (27), for instance, just the same as the prevailing tone in "Clovelly" (23) and other English scenes. The view of Clovelly, by the way, exaggerates the scale of the place. Among others in which architecture plays a principal part, "The Swan Pool, Wells" (53), in which the cathedral towers are seen only in reflection in the water, and "Lucerne" (58), are particularly charming. It is somewhat new, also, to find Mr. Goodwin as a sea painter, but his "Sunset over the Sea" (38) is one of the most beautiful works in the room. The large picture of "The First Christmas Dawn," first exhibited at the Royal Academy a few years ago, and seen in two or three other exhibitions since, is also here. We think it a mistake in an æsthetic sense.

Mr. CATON WOODVILLE's picture of the charge of the Lancers at Omdurman, to be seen at Mr. Maclean's Gallery in the Haymarket, has evidently been got out with all speed to catch the public feeling. It is a kind of picture which it is patriotic to go and see (and we are always patriotic); but we doubt whether either art or the illustration of war gain very much by pictures of this kind. From an artistic point of view this is not an interesting or effective work, nor does it impress one as real: battle pictures seldom do. If any photographer were cool enough to accompany a cavalry charge and take snap-shots during the height of the *mêlée*, people who do not make a business of fighting might get some notion of the realities of such a scene. We doubt if they often get it from a painting.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE APPLICATION OF ELECTRICITY TO BUILDINGS FOR LIGHTING AND OTHER PURPOSES.

The fourth general meeting for the present season of the Royal Institute of British Architects was held on Monday evening, Professor Aitchison, R.A., presiding.

The minutes of the last meeting having been taken as read.

The Hon. Secretary (Mr. W. Emerson) announced the decease of Mr. Henry Bridgford, of Manchester, elected Fellow in 1888, and of Professor Hayter Lewis, elected Associate in 1845 and Fellow in 1852. Professor Lewis was Hon. Secretary of the Institute for a period, and was afterwards elected Vice-President, serving in that office from 1865 to 1867 and from 1878 to 1882.

The Chairman said he wished to propose a vote of condolence with the relatives of Professor Hayter Lewis. They had heard that he was Hon. Secretary and Vice-President of the Institute, and in connexion with and even apart from those offices was always ready to give his counsel and advice on difficult questions. He (the President) had known the deceased Professor for many years, and could bear testimony of him that he was a most accomplished architect and a perfect friend and companion. He had the honour to be associated with him in looking over the papers and drawings of Mr. Wood, who discovered the Temple of Diana at Ephesus. Among his claims to notice was the fact that he wrote the treatise on Architecture in the Encyclopædia Britannica. He died full of years, but in the later years of his life he was very much troubled with illness. He (the Chairman) begged to propose a resolution placing on record the high appreciation of the members of the Institute of the work of Professor Hayter Lewis in furtherance of the advancement of architecture and of the services he rendered to the Institute as Honorary Secretary and Vice-President; and recording the sorrowful regret of the members at the loss they had sustained at his death and conveying to the deceased's relatives their sincerest condolences in their bereavement.

Mr. John Slater said he desired to second the resolution. One claim which entitled the late Professor to their grateful and respectful memory had not been mentioned. Many members of the Institute who, like himself, had arrived at middle age, must remember Professor Hayter Lewis when Professor of Architecture at University College—a position he held in succession to the late lamented Professor Donaldson. Although the late Professor Hayter Lewis was not an ideal lecturer, he (the speaker) could safely say that his one aim and one desire was to give as much help as possible to all the students of his classes. He was sure many members of the Institute had reasons to be grateful for the help thus given while the deceased Professor occupied his chair at University College.

The resolution was adopted. The Chairman next moved that 10l. be voted out of the funds of the Institute to the fund for raising a monument to M. Charles Garnier. The deceased gentleman was distinguished as their honorary correspondent and gold medalist. He (the Chairman) had the pleasure of knowing him slightly, and they all knew his work. He was bound to say that, in his opinion, the late M. Garnier's Opera House in Paris, which was distinctly French in its character, was one of the most extraordinarily clever pieces of architecture which had been carried out in his time. Should any member desire to subscribe to the fund he would be happy to receive and forward such subscription to Paris.

The motion was adopted.

#### Electricity for Country Houses.

Mr. Bernard M. Drake, M.Inst.C.E., then read a paper entitled "Some Practical Hints on the Production and Use of Electricity for Lighting Country Houses," of which the following is an abstract:—Mr. Drake said that to the multifarious knowledge of the architect must now be added a grasp of the "practices" of electric lighting and its attendant paraphernalia. He should confine himself to the practical points which crop up daily in an architect's office, and are searched for in vain amongst the text-books at his disposal. In lighting a country house, the first question concerns the provision to be made for the generating plant, and where it shall be put. The various developed methods at disposal are: 1, steam-engine; 2, petroleum engine; 3, gas engine; 4, water-wheel or turbine; 5, wind engine; 6, primary battery. The advantages and disadvantages of each method were fully considered by the author, whose own experience was that a combination of gas and petroleum, or turbine and steam engine, gave the best results. Each case, however, required an individual study of the local conditions and working requirements before deciding what would be best; it was not a matter which could be safely left to the decorator or hot-water engineer to diagnose. From whatever source the power is obtained, the dynamo for ordinary requirements is the same, except that it requires to be fitted with a fly-wheel for use with petroleum and slow-speed gas engines, providing the engine has to be run while the lights are used. Where only required for charging the

accumulators, this may be omitted, as it wastes power. The most important features in the dynamo for country-house lighting are: (1) Absence of sparking, which wears out both brushes and commutator; (2) perfect balance of the armature or revolving portion of machine, vibration being one of the causes of what are known as flats on the commutator; (3) strong shaft and wide bearings; (4) good automatic lubrication, the best form being a loose ring revolving in an oil bath; (5) absence of heating—undue heating of the armature and magnets causing unnecessary loss of efficiency. The accumulator is a necessity in every country house installation, and the position of the room for its accommodation requires careful consideration. For reasonable distances up to 150 yards the engine and accumulator rooms should be placed alongside each other, as the attendant can see that each cell charges up equally, which is essential to success. Where the current is brought from a distance, or where the light will always be supplied from the accumulator alone, a considerable saving can be made in the cost of cables by separating the engine and battery room. There must be no direct communication between the dynamo and cellar, or the cotton insulation will be found to rot off the dynamo after a few years. In selecting a type of accumulator, the main question is absence of attention, which can only be obtained by having the plates well apart, say half an inch, so that any detached portions fall away, instead of bridging across and exhausting the cell. The author considered that a clear space between the plates was also preferable to enclosing them in any form of celluloid bags or wrappings, which soon become clogged with oxides. The use of a registering meter is recommended in the engine room as the best check on the amount of coal, oil, or gas consumed. The engine house should be placed with due regard to prevailing wind, and not less than fifty yards from the main building. The author next considered the questions of first cost and working cost, giving data applicable to average country house installations, from which also could be determined the class of motive power to be adopted. Results were also given of a week's recent test with a modern generating plant for a large installation of 2,000 lights. In discussing the lighting of rooms, the author emphasised the necessity of having light and dark portions and, as it were, semi-tones. A room lit equally throughout gives a flat effect, and is neither artistic nor restful. A bright light causes an involuntary contraction of the pupil of the eye, and causes a tired feeling which may ultimately result in eye troubles. The ignorance of electricians concerning this simple fact is probably responsible for the complications ascribed by oculists to the electric light itself. The secret of a restful light is the illumination of a large surface with an absence of any dazzling spots of small area. In a room thus lit the pupil of the eye expands to its full limit, and the weakest eyes can read with comfort. To get this result either the rays must be diffused by transmitting them through a large shade, or reflection must be resorted to and the direct rays be projected on the walls and ceiling from some hidden source. The illuminated surface is then greater than that of even the largest shades, and the effect more restful. This treatment in the case of light-coloured walls and ceiling is capable of wide adaptation. A combined shelf and picture rail containing a row of hidden lamps for reflected light had been employed by the author, and pretty effects could also be produced with small lamps concealed in the over-mantel and in china cabinets. Coming to the question of fittings in old houses, the existing candle fittings have often to be adapted, as being in accordance with the style of the room. As regards the objection that imitation candles are inartistic, it must be remembered that the designer had the candle in view as the basis of his outline, and without it the proportions are wrong, and the drip cups and other parts meaningless. An incandescent lamp springing direct from a candle socket is a squat abortion that has nothing to commend it. In these cases every effort should be made to get the precise effect of candles without their disadvantages, and as far as possible to conceal the fact that electric light has been employed. Examples were shown of the way in which old fittings may be treated without detriment to their appearance, and attention was called to the economy of shading only the front of lamps placed against a wall, for thus



the full advantage of reflection is obtained, and an 8 candle-power lamp will take the place of a 16 candle-power if totally enclosed. There were also shown a few typical fittings made expressly for electric light. Having touched upon the fittest material for shades, the colours of which should be tested before making a selection; the objections to working the lamps into plaster-work in the ceilings instead of using metal fittings; the precautions to be taken to avoid risk of fire from the heated lamps, the author concluded with some hints on the treatment of the different rooms, passages, and staircases. In adapting candle fittings to a dining-room table the wires are distributed by a patented connector lying under the table centre, and neither the table nor the cloth is pierced. One of the best effects produced by the author was in the dining-room at Chatsworth, where powerful lamps were hidden in reflectors at the base of the pictures all round the room—thus pictures and ceiling were illuminated and the rest of the room remained in repose. In drawing-rooms, which should be brilliantly lighted, the author preferred to light principally from the walls and from standards, as a top light is unbecoming to ladies, causing dark shadows under the eyes. In picture lighting top as well as base reflectors are frequently necessary with large pictures.

#### Practical Applications of Electrical Power.

Mr. H. R. J. Burstall, M.Inst.C.E., then read a paper on the practical applications of electrical power.

In defining the scope of his paper the author said he proposed to deal with the general principles underlying the application of electrical power, to describe a few typical forms of apparatus, and to discuss the question of the cost of power under ordinary circumstances. Electrical power, as distinct from lighting, in buildings for non-manufacturing purposes, may be generally applied to, roughly, five classes of use: lifting and hoisting, ventilating, driving machinery for small trades and for domestic purposes, pumping, heating and cooking. In all except the last class electrical power is applied by means of electric motors, the type varying according to the purpose for which the motor is required. Most motors are supplied from a continuous current system, the electrical pressure varying from 100 to nearly 500 volts, 200 to 250 volts being the most usual. Describing the general type of motor and its method of working, the author showed that the regulation of speed and power in it is carried out entirely by electrical methods, no sort of governor, as in a steam or gas engine, being as a rule required. Motors used for the purposes under consideration are usually supplied at a constant electrical pressure, and generally made in three types. Where constant speed is required, a shunt-wound motor is used. Where a large turning effort is required and not a constant speed, a series motor is used. A compound type is employed in certain cases. It is sufficient to know not only the power required for a particular purpose, but also the conditions of running, before selecting the type of motor desired, and this selection can only be made from previous knowledge of the work or by experiment under working conditions. The author explained how the motors were regulated to avoid waste of energy. The speeds of electric motors, as usually supplied, range from 1,000 to 1,500 revolutions per minute for sizes from one to five horse-power; but motors running at from 200 to 500 revolutions per minute can now be had, at reasonable prices. Slow-speed motors are largely on the increase, the extra first cost being compensated for by the reduced wear and tear, and by the advantage gained through direct coupling the motors to the machines.

The special machinery and apparatus required in the application of electrical power to each of the five uses above mentioned were next discussed and described. In lifts, although the broad principle of electrically driving them is quite a simple one, the actual machinery has to be most carefully designed and arranged, special motors and switches and gear being employed to ensure efficiency and economy. In ventilation electric motors form the best driving power for operating fans, whether large fans for the ventilation of a building on some complete system, or small fans for extracting the air from particular rooms, or even for stirring up the air in any room in the manner of a punkah. Special care is required to avoid the noise of the machinery, and fan and motor should, wherever

possible, be carried not from the sides of the air trunk, but quite separately from a substantial wall. Noise is often caused by the pulsations of the air set up by the improperly-shaped blades of the fan; in this case little can be done except to alter the fan. The loss during transformations of energy from the boiler furnace at the generating station to the coils in the heating apparatus is so considerable that heating by electricity cannot compete with direct heating by means of gas or coal for any purpose where a large quantity of heat is required. As, however, ordinary heating operations in a house are carried on under conditions in which the heat utilised is but a small proportion of that generated, it is possible, by properly applying the electrical energy, to use such a large proportion of the energy as heat that competition with coal and gas is rendered possible when other considerations as to dirt, &c., are taken into account. Generally speaking, heating by electricity is applied by passing a current through coils of wire of high resistance; the wires are embedded in an insulating covering, and are heated, together with their covering, to the temperature required. Another method, in the author's opinion of great value, is to pass the current through a number of glow lamps, the lamps being proportioned so that their filaments are not completely incandesced, the room then being heated by radiation as with an ordinary fire or gas stove. The lamps are arranged in special reflectors so as to obtain a "beam" of heat rays. The apparatus is simple, easily fitted and understood, and free from risk of breakdown. The heat obtained being radiant heat, does not produce the enervating steeling produced more or less by all methods of heating by warming the air, and the effect produced is similar to that from an incandescent gas stove or bright red coal fire. The author then discussed the question of cost. Electrical energy is charged for at the rate of so much per Board of Trade unit, a unit being an amount of electricity which will keep an eight candle-power lamp alight for about thirty-five hours. This amount of energy is equivalent to 1.34 horse-power exerted for one hour. The Corporation of Edinburgh charge 1½d. a unit for power. In London the average charge is from 3d. to 4d. Private installation on a reasonably large scale, and economically worked, would cost at from 2d. to 3d. per unit. A passenger lift for carrying nine persons, running at a speed of 175 ft. per minute, will require about 600 units per journey, taking the average of the day's work. This, at 4d. per unit, will work out at about one farthing per journey. In ventilating, generally, and very approximately speaking, one horse-power is required to deal with 20,000 cubic feet per minute, which would correspond to about three-quarters of a unit per hour, and, at 4d. per unit, would cost 3d. per hour. Small machinery may be driven by electrical power for fifty-four hours per week at a cost of 48l. 6s. per actual horse-power per annum. An electrical pump, one horse-power, will require the expenditure of about 1½ unit per hour. For heating, an ordinary electrical radiator suitable for a small room costs, at 4d. per unit, from 4d. to 8d. per hour. The Dowling glow lamp radiators require about ½ unit per lamp, and a radiator of four lamps, sufficient for a small room, would cost 4d. per hour at the 4d. rate. An appendix to the paper gave a number of figures in tabular form as to the cost of cooking apparatus. In installing electrical machinery the regulations of the various fire offices as to the use of electric motors should be borne in mind so as to avoid any trouble after the apparatus is installed.

Mr. E. W. Monkhouse, in referring to Mr. Drake's paper, desired to know whether the wind engine spoken of had been in practical operation in connexion with electric lighting installations or whether it had merely been the subject of experiments. It was doubtful whether, for instance, a wind engine would have been of constant service this summer, for that he had to spend a good deal of time out at the Norc in waiting for wind, even in that spot. Nor could he imagine a wind engine being of very much use in a shooting box during a fine season. As to vibrations of dynamos, more were caused, in his opinion, by bad belting than anything else. His experience taught him that it was quite possible to get very good belts, continuous and without jointing, and with these in use there would not be

so much fear of vibration as there would be otherwise. Several of Mr. Drake's figures required explaining. In one particular was there not a small mistake as to the number of lamps that could be burnt per hour for a given number of units? Was it not seventeen?

Mr. Drake: Not according to the lamps now in use.

Mr. Monkhouse, continuing, said he was interested to hear the mention of an installation of 2,000 lights. Where was that installation—what part of the country—what was the cost of coal per ton, the number of hours it ran, and the load factor? As to the amount of light obstructed by frosted globes, Mr. Drake put it at 10 per cent, but he understood that 50 per cent. was obstructed in this way. In one case he had to deal with he had great difficulty in getting arc lamp globes which absorbed as little as 15 per cent.; that was with opaline globes, and frosted globes absorbed more than these. Then with regard to the arrangement of lights in front of dressing glasses, which was a very vexed question. Mr. Drake had presented a good idea; but it so happened that ladies wanted to see their backs, and some sort of arrangement might be devised that would move forward or backward at will. If Mr. Drake could invent something of that sort he would earn the gratitude of the ladies.

Mr. John Slater, in moving a vote of thanks to the readers of the papers, remarked that it was very striking to notice what enormous strides had been made in electric lighting during the past five years, and particularly in the use of electric energy. It was now seventeen years ago that he read a paper in that room on electric lighting, and he remembered that the difficulty then experienced in getting the light was something very considerable. Having no engine, they had to use one in a neighbouring building; an arc lamp was affixed in the top of the dome, and the late Mr. Spottiswoode lent a few incandescent lamps to show what the new illuminant was capable of doing. The development of electricity had been one of the most striking features of the latter part of the century, and how it had won its way into buildings was shown by the various glews given by Mr. Drake. As to the mode of lighting mansions and town houses, he thought that being able to hide the lights and obtain sufficient reflections to light the room, was better than any arrangement of chandeliers, electroliers, or any other kind of suspended fittings. After all, they did not want a room to be different from what it was in the day—having a perfectly diffused light. They were much interested to see the radiator spoken of by Mr. Burstall, because it suggested a way of relieving the dwellers in flats—which were rapidly increasing in London—from the inconvenience of carrying coals to the various floors, bringing down ashes, and so on. If they could get a perfect system of heating by electricity, they would ensure a great improvement in flat life in London. With regard to the development of electric motors, no one who had seen the workshops in which they had been introduced could disbelieve for one moment that, with the abolition of all the paraphernalia of steam, and the cheapening of the cost per unit of electricity, their effect would be more far-reaching than any of them could have possibly imagined.

Mr. Beresford Pite, in seconding the vote of thanks, desired to protest that the effects of the lighting arrangements depicted in some of the views were not satisfactory to the architectural mind. The decidedly ingenious and highly original method of masking lights behind carvings, and of fixing these close against walls on the edge of friezes—creating what was perhaps thought to be pretty effects by throwing violent lights upon the wall—must have an exceedingly bad effect. He had seen it introduced into some West End houses with, he must say, most distressing effect upon the pictures hanging in the rooms so lit. If their electrical engineering friends would consult painters and sculptors, they would find that there was not very much appreciation of the ingenuity which lighted up walls and radiated around pictures rather than the body of the room where light was required. His conviction was that rooms suffered by treatment in this theatrical and rather unnatural way. He would rather see chandeliers with their visible lights than those mysterious hidden fixtures. He desired also to know the prime cost of the motors that had been referred to.



Mr. E. W. Hudson said he had been struck by the great difference in the cost of supplying electricity. In Edinburgh it was mentioned the charge was only 1½d., while in London the price stood at 3d. to 4d. How was that difference brought about?

Mr. Bernard Drake, in replying, pointed out that a wind-engine had been successfully used in connection with the lighting of Cadbury's works at Birmingham. The returns showed that this useful engine had done sufficient to keep 200 or 300 lights going. In a general way the wind-engine could only be said to have supplied sufficient energy to pay interest on its purchase and erection. It was interesting to know that Mr. Stephens was about to put down a wind-engine on Salisbury Plain, and he had been going into calculations with him to ascertain whether he could get forty horse-power capacity from the engine. If so he could store sufficient electricity to be able to transmit all he wanted over his farm for farming purposes. The results obtained from the Meteorological Society showed that the energy they might expect from wind blowing at twelve miles per hour was very considerable. But, after all, the wind engine was only an auxiliary engine, and even if it paid a return upon its erection the trial was worth making. The motor supplying 2,000 lights was at the Auxiliary Army and Navy Stores, and reached, so far as he could remember, 3,000 units per week. With regard to Mr. Pile's criticism of the arrangement of the lighting, he had generally found that people preferred the lights at night to be different in their effect from that existing during the day. Moreover, the hidden lights commended themselves to many persons because they desired to see the artistic features of their room brought out more than was possible by day.

Mr. Burstall also answered several queries, mentioning, in regard to the prime cost of motors, that one capable of developing four-horse power could be obtained for 60l.; and, generally speaking, their prices were in an inverse proportion to their capacity.

The vote of thanks having been agreed to, The Chairman announced that the next meeting would be held on January 16.

#### PROFESSOR LODGE ON SPACE TELEGRAPHY.

THE paper which Professor Oliver Lodge, F.R.S., read to the Institution of Electrical Engineers a few days ago on "Improvements in Magnetic Space Telegraphy," probably marks the beginning of a new epoch in telegraphic science. The paper did not give a complete description of the new system, but was merely the first of the two or three papers Dr. Lodge intends reading at the Institution in order to fully describe it. Enough was said, however, to show that the method is the outcome of his well-known experiments, showing the resonance of a properly attuned Leyden jar circuit when another Leyden jar is discharged in its neighbourhood. Frictional electricity is not used but only ordinary alternating currents, and instead of Leyden jars large telegraphic condensers. Dr. Lodge humorously described his first experiments at Liverpool. He had arranged at his house a cable in the shape of a large loop about a quarter of a mile round and in the circuit were inserted a condenser and an Ader telephone. On this telephone he could hear all that went on in the neighbouring telephone wires, that is, he could hear the confused jumble of all the conversations going on at any one time and with a suitable microphone he could talk to all the people who had their ears at the Company's telephones. He arranged a similar loop of the cable at the college two miles away, and when this was actuated by a suitable alternator the note could be plainly heard at his house. Unfortunately it could also be heard on the telephones of the National Telephone Company for miles around, and the subscribers in the neighbourhood of the college were not only indignant but almost furious. The main point which this earliest experiment brought out was that if we have two circuits tuned to one another, then, at a distance of two miles, the inductive action between them was plainly audible. Why this effect has only been observed before on very rare occasions is because it is very rare for two circuits to be accidentally attuned to one another. Dr. Lodge, by introducing a suitable condenser in

the receiving circuit, can make it many million times more sensitive than it would be without the condenser. In some similar experiments made recently by Mr. Stevenson on two of the northernmost of the Shetland Islands, described in the proceedings of the Royal Society of Edinburgh, it is stated that "the phonopore which the North British Railway Company have on their lines kept up a nearly constant musical sound which entirely prevented observations. On getting the phonopore stopped signalling became easy." To any one who looks at the map and sees the distance between the North British Railway Company's lines and the extreme north of Shetland the importance of this experiment is obvious. With a receiving circuit like Dr. Lodge's tuned to the phonopore, communication would have been easy. One great advantage of the Lodgian system is that as the circuits are tuned to one another a receiving circuit will only take notice of radiations of the proper period of vibration. This, of course, gives this system an immense pull over the so-called wireless telegraphy with Hertz waves. Hertz waves signals also travel in straight lines and will not go round the curvature of the earth. In Lodge's system it is quite possible that a large coil of wire spread out in England and actuated by alternating currents, would transmit signals to a similar coil in New Zealand, if the coils were attuned to one another. If the electrical conductivity of the earth proved to be very high it might act as a screen, but in this case if the coils were raised to a moderate height above the surface it might still be possible. Mr. Preece, in proposing a vote of thanks to the author, mentioned that the Post Office were going to give his system a thorough trial; he also mentioned that the induction system of telegraphy, as apart from the system with Hertz waves, was the only practical one. This was a noteworthy admission for him to make.

Dr. Lodge, after his paper, showed some of his improved receivers, and transmitters. He showed an ingenious arrangement for magnifying signals by means of relays, the signal in the first receiver being practically inaudible, but after passing through three multiplying relays it made an almost deafening noise. By his sounding-board arrangement he has succeeded in really magnifying the human voice. The ordinary microphone, as is well known, is a failure as a voice magnifier, as it spoils the tone of the voice utterly, and simply makes a great roaring noise. With Dr. Lodge's arrangement, "Auld Lang Syne" sang in another room of the building was transmitted to the Lecture Theatre of the Institution and there magnified, sounding like the hearty singing of a giant.

#### THE ARCHITECTURAL ASSOCIATION: THE POSITION OF ARCHITECTURE AMONG THE FINE ARTS.

THE following is our report of the discussion on Mr. Edwin T. Hall's paper on "The Position of Architecture Among the Fine Arts," read before the Architectural Association on the 9th inst., and printed in our last issue:—

The Chairman (Mr. G. H. Fellowes Prynn), in opening the discussion, said they had all listened with pleasure to Mr. Hall's beautifully-pictured ideas on architecture. There was one feature about the paper which would greatly help them in discussion, viz., the absence from it of that gloom as to the present state of architecture which characterised the utterances of some of their friends. The chief ideas in the paper had been elevating to a great extent.

Mr. F. T. Baggallay, in proposing a vote of thanks to Mr. Hall for his paper, said that the lecturer had treated an old subject in rather a new way, and had dealt with it not, as usual, through his imagination and his sympathies, but by going to various authorities and by examining the history of architecture he had tried to find a clue to its position among the arts; though he (the speaker) did not know exactly what Mr. Hall's conclusion was. He understood, however, that Mr. Hall agreed with the old saying that architecture is the greatest of the arts and the mother of them all. The subject had often been discussed before, but he did not know that they were much better for it, and his opinion was that, though the subject was of great academic interest, the gain to architecture which would result from a settlement of the question would not be great, nor did he think it would result in any increase in popular estimation of architecture.

As to the definition of the word "art," philologists told us that it was an old Aryan root, and simply means hand skill; fine art, on the other hand, was a modern word and seemed to have been invented to give a certain distinction to painting, sculpture, and architecture, because they were supposed to be the arts to give pleasure. He thought that the term in men's minds had included for many years past a good many other arts—certainly music and poetry. He was not sure that a change had not occurred also in their ideas of the aim of fine art. Fine art was defined as having the aim of giving pleasure, but for years past there had been tacit admission that so far as its artistic value was concerned it might aim at emotions other than pleasure. It was equally fine art when it appealed to sorrow, or any other natural emotions. There was a good definition in the Dictionary of Architecture, which stated that fine art is an art with the quality of intellect and imagination, as distinct merely from hand skill. In considering architecture among the fine arts, they must remember that there was a good deal of difference between ordinary, everyday work, and purely, or mainly, monumental work—from a drinking fountain to a national memorial. They might apply any test they liked to the monumental work, and it ought to be fine art—one of the noblest of the fine arts—but the primary object of everyday work was a utilitarian one. On the other hand, the main object of such arts as painting, sculpture, and music was an æsthetic one. Painting, sculpture and music could be applied to utilitarian objects—as, for instance, in Cruikshank's picture, where he depicts the influence of drink; or martial music used to rouse the valour of soldiers; or oratory when employed to influence public opinion. They might be used for utilitarian purposes, but that purpose was always aimed at through the art and by means of the art; whereas in architects' work (setting aside monumental buildings), although they had an æsthetic end in view, their primary object was utilitarian and the æsthetic object was secondary. It was as well to bear in mind that difference when a claim was being made for placing architecture among the fine arts. In the days of Michelangelo and Raphael architecture was in every sense a fine art, but since then they had become more utilitarian in architecture, and were becoming more so every day; people thought more of the utilitarian side of architecture than they ever did, and it seemed to him that until they could separate the purely utilitarian from their monumental work architecture could never recover in popular estimation that position among the fine arts that it once held.

Mr. Thomas Blashill, in seconding the vote of thanks, said that one great merit of the paper was its healthy tone. The paper did not give a misanthropic treatment of art; there was nothing in it which attempted to teach that everything in architecture which had been done since some particular date, down to the present time, was bad; and there was nothing in it which would lead a young man to despair of the work he was engaged upon. Mr. Hall did not encourage that kind of view. Seventy or eighty years ago, in the days of Nash, and at the time of the construction of Regent-street and Trafalgar-square, most men who were "architects" spent some years on the Continent—generally in Greece—and when, on their return, they were commissioned to erect, say, a shire hall or a nobleman's mansion, they simply took the design of some temple or other they had seen and furnished it up for the occasion, leaving it to some man who had probably been brought up at the bench and who had a practical knowledge of architecture, to arrange the disposition of the building behind the façade. The result, though not satisfactory, was not surprising. We had taken a step in advance of that; but still he thought that a change had come over public taste in regard to architecture, and we had lost the love of the beautiful and were worshipping the ugly instead. To take Georgian architecture, for instance, and adapt it to our uses was to make a conception which could not be called beautiful and which he would venture to call ugly—with great deference to those who thought differently. That, in his opinion, was not very hopeful for the future, and did not lead in the right direction. There was one style of architecture which they could learn from—the style of the French Renaissance château—and yet how little had been learnt from it, and how little it had been used



in our buildings of to-day! He did not suggest copying that work, although it was adapted to quite a modern style, but there were ideas which they could take from it with advantage. He would call to mind the chateau of Azay-le-Rideau. In that house he felt he could live in comfort, for it, and others of the period, seemed to just suit modern needs. The architecture was descriptive of the nation and the people. Of course, ours should in like manner conform to our national ideas.

Mr. Banister F. Fletcher said he thought that Mr. Hall had not kept to his text, for he had not said much as to the position of architecture at the present time. Had Mr. Hall done so, they would have heard something very lugubrious, he was afraid. With regard to the Parthenon frieze, which Mr. Hall had referred to, Dr. Dörpfeld, who had had great opportunities for studying it, assured him that it could be perfectly well seen by any one standing on the ground, for the reflected light in the sunny and clear atmosphere was quite sufficient to light up the frieze; consequently there was not so much mystery as Mr. Hall seemed to think. The Sistine Chapel was, of course, a wonderful work, but it had always seemed to him that the proper place for the figure paintings now on the ceiling of the chapel was on the wall, where they could have been seen without effort. As to the site of a building, he thought that the external part of the Law Courts showed Street's skill more than the plan of the building did. The Law Courts were really a collection of buildings, and did not attempt to be a building as a whole, and great skill had been shown in the way they were disposed on the site, so as to be seen rounding the curve of the narrow street on the opposite side of the way. As to Mr. Hall's concluding remarks, that art flourished best in the decadence of a nation, he would like Mr. Hall to give an instance of any nation's architecture being greatest in the days of its decadence. Surely it was generally the reverse.

Mr. C. H. Brodie, in supporting the vote of thanks, asked why Mr. Hall should think that the accessible flat roof belonged essentially to the tropics? One of the greatest of our faults in this country in modern architecture was the absurd way we treated the roof in narrow streets, especially high-pitched roofs. They could not be seen in narrow streets, and it was a waste of money to provide them. He mentioned two or three instances of pyramidal and domical roofs in central London, which could not be seen from the streets, and were quite out of place. The Americans did better in that respect, for in their tall buildings they provided flat roofs and level skylines almost without exception, and the sooner we did the same the better for our street architecture.

Mr. Arthur S. Flower said, as to the question of architecture being a profession or an art, he was surprised some time ago to hear a not unknown painter—Mr. Holman Hunt—talk about his "profession"; and hearing that, he (the speaker) thought that an architect ought not to object to being called a professional man. The idea of the union of the arts seemed to date from that most artistic and enlightened monarch, George III. He (the speaker) did not know that there was any close connexion between the arts before the creation of the Royal Academy, and in his opinion architecture had suffered from that union very much ever since, and he thought it would be a good thing for architecture in England if the Academy would take for painting and sculpture that little room which they gave up to architecture, and let architects have a separate exhibition of their own. A young architect amongst painters and sculptors was apt to take too much of a back seat. He thought that architecture might be more independent; and that a young architect might learn more from an association with engineers or musicians than by deferentially associating himself with painters and sculptors. Architecture was not an art in the narrow sense of the fine arts. A man could suit himself up in a room and paint a picture, carve a statue, compose an oratorio, or produce art in poetry or prose; but to carry out a work of architecture a man had to go out into the world and work with men, and, to some extent, to control men. He had also to understand what had been done before. A man could compose a poem straight out of his head, so to speak, but in architecture they could not get entirely away from tradition and precedent; they might want to do it, but they could not. There were analogies between the "art" of architecture and the "art" of war. All the best

modern soldiers and sailors strongly insisted on the importance of reading what had been done before. The successful commander was he who had studied what had been the conditions and problems of the past, and who, with the faculty of imagination, used that knowledge in dealing with the problems of to-day or the future. It was much the same with architecture; that also required much preliminary hard work and study, and beyond that a faculty for rapidly grasping new conditions and meeting unforeseen difficulties as they arose. There was a great deal in actual building which put it on a different footing from the other arts, and that could not be got away from. The idea of separation from the Academy was, of course, an unpleasant one, and he did not suppose that any one would take it up in the present century; but when the Ferguson of the next century wrote his history, he hoped that that would be an accomplished fact. He was sorry to have to suggest a different reading from Mr. Hall as to the suppression of Gothic in England. He could not say with Mr. Hall that Gothic architecture was associated with oppression and licentiousness. He supposed that the greatest promoter of the Renaissance in England was Henry VIII., and it was scarcely libellous to say that that monarch was not guiltless of those vices. The next great patron of the movement was the Protector Somerset, and if ever there was a villainous oppressor it was that man, who pulled down a great many churches along the Strand in order to build his palace—Somerset House. Then there were the courtiers of the time of Charles II.—Vanbrugh and men of that kind: these were hardly the people who could be supposed to be particular about such matters. As to symmetry in building, he scarcely supposed that Mr. Hall was a disciple of that ingenious American who thought that all the pretty unsymmetrical effects in Italian Mediæval work were carefully measured and worked out of set purpose; he did not think that the architects of the past consciously did anything of the kind.

The Chairman said that Mr. Ruskin had given a definition of architecture, viz., that a building in itself was not necessarily architecture. It was very necessary to remember that in thinking of just the convenience of a building, Ruskin also said that immediately they used mouldings or ornament architecture commenced. As to the early training of students, he agreed with Mr. Flower. Although they wished they had technical classes and early training in the actual technical branches of an architect's work, yet they thought that that training should be combined with a study of the past; that Mr. Hall seemed rather inclined to put aside. Mr. Hall seemed inclined to put the study of history in the background, but he (the speaker) thought the study of history ought to be combined with their other studies; not to copy the past necessarily, or to become a stylist—for that was a fatal mistake—but to assimilate the past in the present. To ignore the past and say we must begin *de novo*, to attempt to create something out of nothing, was presumption. What was really good and best in the past should be the foundation of the present, and in trying to get originality they must be eclectic. It was only in that way that they could obtain good and scientific and artistic results. He thought that Mr. Hall would agree that Mediæval architecture was a thing of growth. They were so accustomed, in looking at their books—Fergusson or Rickman—to say, "This is Perpendicular; this is Geometrical; this is Early English;" but it was a great mistake as a principle: one style gradually glided into another, and though we thought of styles, as styles, they were the outcome of very gradual growth, and it was hard to tell where a change took place. As regards the housing of the poor, Mr. Hall had given them some really useful thoughts on the subject. The housing of the poor in Peabody and such buildings had not been a success, and the problem was one of the most difficult that London had to deal with, and Mr. Hall's suggestion of a central hall, &c., might be considered with advantage. He must join issue with Mr. Hall about the barrel-vaulted church. Where the pressure was even it was wrong not to have buttresses at intervals. He also disagreed with Mr. Hall that art was dead at the time of Elizabeth. Surely that was not so! Church architecture was, but the artists of the time were active and they evolved a style—the Elizabethan—which was a growth of thoughtful minds, and with such a

style it could not be said that art was dead. Mr. Hall also said that Westminster Abbey was scarred but not marred by the sculpture in it. He could not agree with that. He thought that much of the hideous stuff in the Abbey would be better away, for it spoke more of the glory of man than of God—though he did not ignore the historical and artistic value of much that was there. As an historical mausoleum it was a marvellous monument; but he could not but feel that the building was marred by many of the commonplace and incongruous monuments there. He fully agreed with Mr. Hall about the Sistine Chapel. The awe-inspiring genius of the artist obliterated the architect. We spoke of Michelangelo as an architect, painter, or sculptor, but the painter's art was the all-pervading influence of his life: the architecture had no chance. The chapel was built for the paintings, but, as Mr. Hall had said, the figures seemed upside down when seen from the altar. Mr. Blashill had remarked that the architecture of the French Renaissance was descriptive of the nation and the people, and that was his (the speaker's) strongest argument for not copying it. Our architecture, at least our domestic architecture, spoke of the national feeling amongst us: in France, the architecture spoke of the character of the people too. There might be many ideas which we could get from that work, but to copy the chateau would be a mistake, for it would falsify our history. As to the love of the beautiful giving place to a love of the ugly, if we studied the best in the past and did not slavishly copy it, and tried to make our work beautiful, we should not go far wrong. As to the Law Courts, he was in Mr. Street's office at the time the building was being erected, and he could speak as to the way Mr. Street was worried by the Government. The plan was ruined by the manner in which it was cut down time after time. Mr. Street did the best he could with a bad job, and we could not go past the building without admiring it; but Mr. Street was not to blame for the plan as it was cut down by every successive government. In regard to gables in English architecture, he thought that those in Holborn were sufficiently beautiful to show how beautiful our streets might be made. As to Mr. Flower's remarks about the combined arts, surely they were combined before the time of George III.,—in the time of Michelangelo, for instance. He did not see why they should not be combined, though he agreed with Mr. Flower's remarks about the Academy school of architecture. There was a warm, helpful, enthusiastic spirit in Mr. Hall's paper; he wished that that spirit could be infused into their work: it would be better for it. It was a burning enthusiasm that they wanted in their art—something behind them pushing them forward and along to the goal of all that is truthful and beautiful in art. If they could feel that in their work, that work would be a success.

The vote of thanks was then put and carried unanimously.

Mr. Hall, in reply, said in answer to Mr. Baggally that he had tried to avoid using that hackneyed phrase "architecture was the mother of the arts." What he had tried to suggest was the way architecture might be used to advance art—not seeking to compare it with any other branch of art, but rather seeking to show that architects could work cordially with other artists. The aim of his paper was to show that in their work they should seek for new architectural creations. He did not wish to deprecate the study of history in architecture, for he thought that that study was essential. A reference to his paper would show that he thought that they should study history to learn how to evolve something new—not to copy. He did not think that they should begin a young student's education by teaching him history, but that they should show him how to get at the principles of design, and then to lead him back to history—when he would appreciate it. They had all seen such houses as Mr. Blashill had referred to—where the exterior and interior had no relation to one another—and that was a result of the improper study of history. Mr. Baggally said that we nowadays had to express our art through the utilitarian—in other words, to commence from that which was necessary and from that to build up the whole. That seemed to him to be the right and proper method. We should commence on the plan. Every architect knew that the



elevation was running through his brain while working at the plan, and all went together. He agreed to a great extent with Mr. Blashill's remarks as to the French Renaissance chateau work: there was much suggestiveness in it. He was not disposed to recede from his position as to flat roofs. Flat roofs were excellent from the utilitarian point of view, but in our climate a picturesque skyline was better than a hard line in a street, always providing that it sprang naturally from the design of the building. He had often built commercial buildings and made the roof a valuable part of the floor area, but he had done that for the exigencies of trade, and not because he thought it was beautiful. He thought that Mr. Flower's remarks that an architect needed to mix with men were most useful. Social intercourse was an excellent incentive to creative thought in designing buildings. He also fully agreed with Mr. Flower as to the value to a student of reading so as to assimilate what the men of the past had to teach; but although a soldier read up old military history he would not order a modern battle on lines adopted by Hannibal, nor should we design a Town Hall on the lines of a Greek Temple. He was not defending Henry VIII. or Charles II., but he did say as a historical fact that Gothic architecture ceased at the time of the downfall of the monastic orders, and was not revived until the present century, and it was a matter of fair inference to say that the people ceased to subscribe to the building of Gothic churches because they were shocked at the licentiousness of the monasteries. No such buildings were erected even in the times of Mary, or Charles I., or James II. As to the variations from absolute symmetry in symmetrical buildings, he did not think that architects deliberately worked out trifling variations, but the point was that symmetry was not the same thing as cast-iron uniformity.

The Chairman announced that the next meeting will be held on January 6, when Mr. H. H. Statham will read a paper on "House Planning from the Aesthetic Point of View." The meeting then terminated.

#### THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

The fifth meeting of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, W., on the 16th inst., Mr. H. J. Leaning, Chairman of the Section, in the chair.

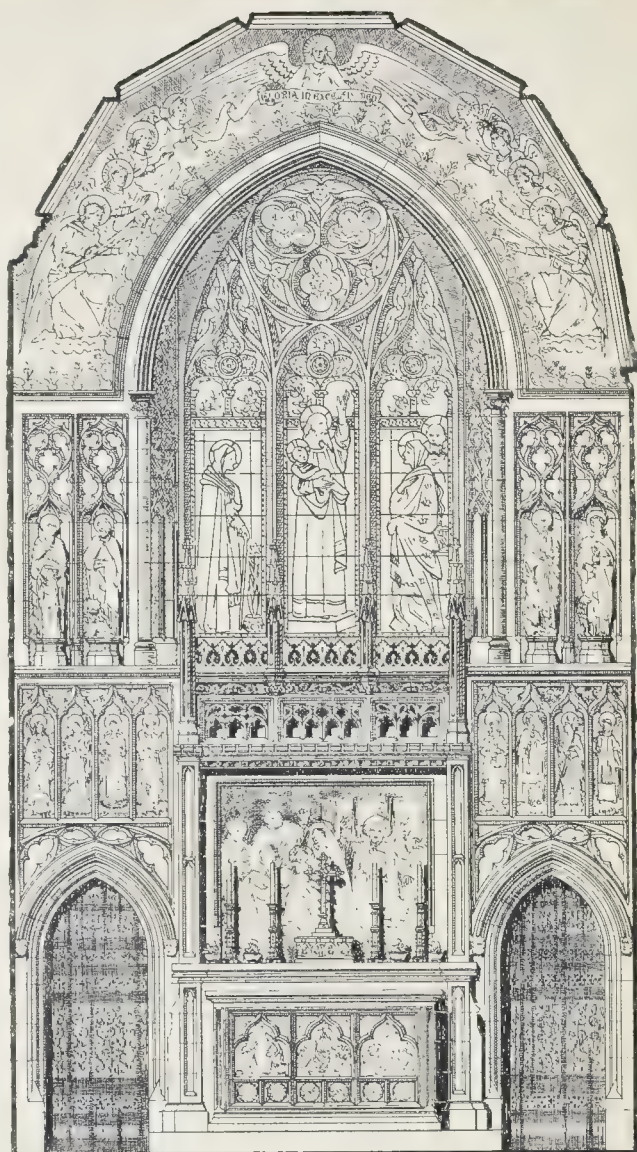
A paper entitled "Technical Institutes" was read by Mr. S. W. Cranfield, in which he described their origin, growth, and present requirements. Attention was called to the necessity for providing instruction in the trades peculiar to the districts in which the institutes would be situated. The disposal of the various class-rooms, workshops, social rooms, hall, &c., was fully commented upon, together with the cost of maintenance.

In the course of the discussion which followed, Mr. E. W. Mountford said he thought polytechnic institutes in London were becoming things of the past in consequence of the adoption of technical education by the London School Board. He referred to papers on the subject of technical institutes which had been read by Mr. Sidney Wells, the Principal of the Battersea Polytechnic, and by Mr. Hewitt, of the Liverpool Technical Institute, as being of special value to architects. He generally reviewed the special features requiring attention in planning and fitting the various rooms, hall, entrance hall, lavatories, &c.

Other members having spoken, a vote of thanks, proposed by Mr. H. A. Satchell, and seconded by Mr. E. W. Mountford, was passed with acclamation to Mr. Cranfield for his interesting paper. Mr. Cranfield replied briefly, and the meeting terminated.

The next meeting of the Section will be held on January 13, when a work upon a subject relating to architecture will be discussed.

**LECTURE ON GRANITE.**—On the 16th inst., in Aberdeen Trades Hall, Belmont-street, Mr. W. Kelly, architect, Aberdeen, delivered a lecture on "Work in Granite," to the members of the Operative Masons and Granite-cutters' Union. In the course of his remarks Mr. Kelly pointed out that the earliest buildings in the city were of freestone, the only prominent mediæval buildings of granite remaining being Old Machar Cathedral and St. Mary's Chapel.



East End of Chapel, St. Stephen's Church, Devonport. Messrs. St. Aubyn & Wadling, Architects.

#### ST. STEPHEN'S CHURCH, DEVONPORT

This drawing shows the altar, reredos, and decoration of the end of the chapel, which, with a new vestry and south aisle, giving additional accommodation for 150, have been added to complete this church, at a cost of about 3,500l. The reredos, tracery, and panels are of Corsham stone, the altar is made of ship oak with Devonshire marble top; the re-table is also of Devonshire marble. The subject picture over the altar is to be painted in oil, and it is proposed that the decorative figures in panels, &c., shall be executed in mosaic. The contractors are Messrs. Pethick Bros., of Plymouth, and the architects are Messrs. St. Aubyn & Wadling, of London.

**WINDOW, DOGMERSFIELD CHURCH, HANTS.**—A stained glass window has recently been erected in Dogmersfield Church in memory of the late Lady Mildmay. The window represents the Annunciation, and is the work of Mr. Christopher W. Whall.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held in the County Hall, Spring Gardens, on Tuesday, Mr. McKinnon Wood, Chairman, presiding.

**Loan.**—On the recommendation of the Finance Committee, it was agreed to lend the St. Olave's Guardians 50,000l. for the erection of a workhouse.

**The Superintending Architect.**—The General Purposes Committee reported as follows, the recommendation being agreed to without discussion:—

"On the 6th instant we reported that we did not see our way to bring up a recommendation with regard to any of the applications received for the appointment of superintending architect. Although we have given further consideration to the question of the steps which should now be taken for filling the appointment, we are not yet in a position to bring up



a report to the Council on the subject, and it will therefore be impossible to fill the appointment by the 31st instant, the date mentioned in the resolution of the Council of October 25, for the retirement of Mr. Blashill. In the circumstances we propose (Mr. Blashill having expressed his willingness to such an arrangement) that Mr. Blashill should continue to hold his appointment for a further period. This period should, with a view to our having opportunity for carefully considering the question of filling the appointment, be not less than three months. We accordingly recommend.—That the retirement of Mr. Blashill from his appointment as superintending architect of the Council be postponed for three months, *i.e.*, until March 31, 1899, and that the resolution of the Council of October 25 last be varied by the substitution of the words, "March 31, 1899," for the words "December 31 next."

**Science and Art Instruction.**—The Technical Education Board submitted a report recommending that the Council should notify to the Department of Science and Art its willingness to be responsible for the science and art instruction within the County of London. After some discussion, the recommendation was adopted.

**The Housing Policy.**—The Housing of the Working Classes Committee brought up a report asking that supplemental estimates of 950*l.* and 2,030*l.* in respect of the erection of Benson and Abingdon-buildings, in the Boundary-street area, be approved. The manager of the Works Department had declined to accept the original estimate, and accordingly tenders were advertised for, but not one was received, and they now recommended that the work be given to the Works Department at 2,080*l.* more than the amount of the original estimate.

Mr. Bruce, in moving the adoption of the report, said when these two blocks were completed the Council would have erected on the Boundary-street area twenty-three blocks, accommodating 5,380 persons, without any charge upon the rates. The Housing Committee during the past few weeks had come in for some very harsh criticism, which was altogether unwarranted, and he now asked Mr. Burns and Mr. Dickinson to assist in removing the conditions of contract which put the Works Department in the position of a monopoly. In this case not a single tender had been received, and the Committee were forced to go to the Works Department and to pay very much in excess of the architect's estimate. He did not believe it was ever the intention of the Council that the Works Department should become a monopoly, but that it had become a monopoly no one could deny.

Mr. Westcott was strongly opposed to the Council erecting dwellings which involved any charge upon the rates.

Mr. Bruce having explained that the sum now asked for would not impose any charge on the rates, the recommendation was adopted.

The same Committee asked the Council to approve of a supplemental estimate of 1,502*l.* 2*s.* 5*d.*, in reference to the erection of cottages comprised in the Brook-street, Limehouse, scheme. The circumstances in this case were much the same as in the last, with the exception that in this instance the enhanced cost involved a small charge upon the rates. The Committee recommended:—

(a) That, owing to the special circumstances which bring the case within standing order No. 315 (3), the operation of standing order No. 315 (2) (a) be suspended so far as it relates to the erection of cottages on Plot II. of the land comprised in the Brook-street, Limehouse, scheme.

(b) That the supplemental estimate of 1,502*l.* 2*s.* 5*d.* submitted by the Finance Committee in respect of the erection of cottages on Plot II, Brook-street, Limehouse, scheme be approved, and that the plans, specification, and quantities be referred to the manager of works in order that he may erect the cottages at the amount of 5,000*l.*

Mr. Boulnois, M.P., moved an amendment to refer the recommendation back to the Committee, with an instruction to offer the site to the Improved Dwellings Company, without any other condition than that the approval of the Home Secretary must be obtained to the plans of any buildings which might be placed upon the site.

Mr. Cohen, M.P., seconded the amendment.

Mr. Dickinson said although he held very

strongly indeed that they ought not to build at a cost to the rates, he had never suggested that there might not be cases in which it would be necessary to depart from that rule. In this case, he thought the matter ought to have been referred to the architect a second time to see whether he could not devise other plans which might be carried out without any charge being made upon the rates.

A vote was then taken on Mr. Boulnois's amendment, with a result that it was rejected. A division was taken upon the Committee's recommendation, when there voted 47 for and 56 against, and consequently it fell to the ground.

**"Ornamental" Ventilating Columns.**—The Main Drainage Committee reported that their attention had been called to offensive emanations from the northern low-level sewer along Cheyne-walk and the Chelsea Embankment, and with a view to obviating any further cause of complaint they recommended that an expenditure of 750*l.* be sanctioned for the erection of nine ornamental ventilating columns from the northern low-level sewer in Cheyne-walk and Chelsea Embankment, that the offer of Messrs. Stone & Co. to supply the columns, 30 ft. high, in accordance with the pattern, at 30*l.* 10*s.* each, be accepted, that the pattern be purchased by the Council for the sum of 60*l.*, and that the work connected with the fixing of the columns be carried out by the Works Department.

The Earl of Meath protested against one of our finest embankments being spoiled by these "ornamental" columns. What he saw before him was a representation of a stove-pipe. He believed the people of Chelsea would much rather endure the offensive emanations from the sewers than these offensive erections.

Mr. John Burns, M.P., said the Main Drainage Committee had had persistent applications from the people living on the Embankment that they should devise some method of ventilating the sewer. Chelsea seemed to be divided on the subject, one member being for stopping the bad smells, and the other took the æsthetic and artistic line. In view of representations from the vestry, the medical officer, the surveyor, and the people in front of whose houses these shafts would be, the Council had no alternative but to try the experiment.

Mr. Costelloe characterised the shaft as an atrocity, and besides he believed it would not ventilate the sewer. Whatever good or evil it might do, it would be always hideous.

Dr. White moved "That the recommendation be referred back to the Committee." He wondered why any man who had any taste could sanction such an abomination. It was surely possible for the Main Drainage Committee to find something more artistic and decorative.

Mr. Bull, in seconding the amendment, said there would be a tremendous outcry in London if the erection of these shafts were sanctioned.

After some further discussion, the recommendation of the Committee was agreed to.

**Memorial to Andrew Marvell.**—The Parks and Open Spaces Committee reported that they thought it desirable that any points of historic interest which may attach to the places under the control of the Council should, as far as possible, be made known to the general public. In furtherance of this view they suggested that a brass tablet should be fixed to the boundary wall of Waterlow Park, next Highgate-hill, to indicate the site of a cottage in which Andrew Marvell for a time resided. They recommended that the tablet should bear the following inscription:—"Four feet below this spot is the stone step, formerly the entrance to the cottage in which lived Andrew Marvell, poet, wit, and satirist; colleague with John Milton in the Foreign or Latin Secretaryship during the Commonwealth, and for about twenty years M.P. for Hull. Born at Winestead, Yorkshire, March 31, 1621; died in London, August 18, 1678, and buried in the Church of St. Giles-in-the-Fields. This memorial brass is placed here by the London County Council, December, 1898."

After discussion this was agreed to.

**Working Colony for Epileptics.**—On the recommendation of the Asylums Committee it was agreed (a) that the Council do approve the provision of a working colony for the male epileptic insane on the Horton Manor estate. (b) That the estimate of 3,000*l.* to be submitted by the Finance Committee for preliminary expenditure in preparing drawings, specifications, bills of quantities, and taking out levels for the necessary buildings for 300 patients and staff, be approved.

**Boadicea Statuary Group.**—The Highways Committee reported that the First Commissioner of Works had given his approval to the erection of this group on the site proposed at the end of the Victoria Embankment, by the corner of Westminster Bridge. The Committee also reported as follows, the recommendation being agreed to:—

"Mr. T. G. Jackson, R.A., with whom the architect has been in communication, has submitted a sketch, which we have approved, of a pedestal for the group. The height of the base of the group is shown upon this sketch as to be about 11 ft. 6 in. above the top of the embankment steps, *i.e.*, 5 ft. higher than the temporary platform upon which, in order that the general effect might be seen, a plaster model of the group was placed, and remained for some time. We have received a joint report from the engineer and the architect, suggesting that the inner portion of the pedestal should be constructed of brickwork, and the upper part faced with Portland stone, and the lower part with granite—as this mode of construction would be less expensive than the use of granite throughout—and that the cover of the pedestal, upon which the group will stand, should be of bronze. They estimate that the cost of the work, if carried out in the way suggested, would be about 1,000*l.*; and, having fully considered the matter, we think that this is a fair estimate. . . . We recommend that the Council do approve the special maintenance estimate for 1,000*l.*, submitted by the Finance Committee in respect of expenditure incurred, and to be incurred, under the resolution of the Council of March 29, 1898, authorising the Highways Committee to make the necessary alterations to the Victoria Embankment wall to enable the Boadicea statuary group, presented by Mr. J. I. Thornycroft, to be placed in the position indicated in that resolution."

**Memorial Tablet to the late Sir Joseph W. Bazalgette.**—The same Committee also recommended, and it was agreed, that the Council do approve the placing on the carriageway side of the wall of the Victoria Embankment, and close to the floating fire-brigade station near Charing Cross pier, of a memorial tablet to the late Sir Joseph Bazalgette; provided, however, that the design for such memorial tablet, and the proposed inscription therefor, be submitted to and approved by the Highways Committee, on behalf of the Council, before such tablet shall be placed in the position indicated.

**The Millbank Estate.**—Plans, specifications, quantities, and estimates were submitted in respect of the erection of two blocks of dwellings, to be called Leighton-buildings and Millais-buildings, on the Millbank Estate. The Housing Committee reported that accommodation would be provided for 240 persons in thirty two-room and twenty three-room tenements. The tenements were all self-contained, and the estimate of the cost of the two blocks of dwellings amounted to 13,024*l.* They recommended that the work should be referred to the Works Department for execution at the amount of the architect's estimate of 12,380*l.*, and that in the event of the manager of that Department refusing to accept the work on these terms, an advertisement be issued for tenders from contractors.

This was agreed to.

**Discharge of Dangerous Substances into Sewers.**—The Main Drainage Committee reported as follows, the recommendation being agreed to:—

"On November 29 we reported to the Council on the subject of an explosion which had taken place at the Abbey Mills pumping-station in consequence of the ignition of a mixture of petroleum vapour and atmospheric air, and, in accordance with the Council's resolution of the same day, the solicitor and chief officer of the Public Control Department have prepared a form of order to be served by the Council upon any person who may, in its opinion, be acting in contravention of Section 10 of the Council's General Powers Act, 1894, which provides for the prohibition of the discharge of dangerous substances into sewers. We now recommend:—(a) That the Council, in exercise of the powers conferred by Section 10 of its General Powers Act of 1894, do make and pass an order as follows:—The London County Council being of opinion that the introduction into a sewer, either directly or through any drain or channel communicating therewith, of petroleum, or of any product of or residue from petroleum, or of any liquid or substance giving off, or liable to give off inflammable vapour, involving danger or risk of injury to the health of persons entering the sewers, and is injurious to the structure or materials of the sewers and works of the Council hereby, pursuant to the provisions of Section 10 of 57 and 58 Vic. cap. 212, absolutely prohibits any petroleum or any product of or residue from petroleum, or any liquid or substance giving off, or liable to give off, inflammable vapour, being caused or



permitted to fall, flow, or enter, or to be carried into, any sewer either directly or indirectly."

*New Theatre, Harwood-road, Fulham.*—The Theatre and Music Halls Committee reported as follows:—

We have considered seven drawings, dated December 9, 1898, showing a theatre which is proposed to erect on the east side of Harwood-road, at its junction with Fashoda-place, Fulham. The site does not strictly comply with the regulations, as out of a total boundary of 441 ft., 216 ft. instead of 220½ ft. abut on public thoroughfares of the required width. To compensate for the small difference a private road is provided, 20 ft. wide on the north-west side, and 12 ft. wide for a distance of 48 ft. along the north-east side. We are therefore of opinion that the site may be regarded as satisfactory. The theatre, which is in the Council's jurisdiction for licensing purposes, will have seating accommodation for 1,455 persons. Three exits, 4 ft. 6 in. wide, are provided from the pit instead of two 5 ft. wide as required by the regulations. The plans comply with the Council's regulations in other respects except that the handrails are not recessed into the walls in all cases where possible."

They recommended that the drawings be approved on certain conditions. This was agreed to.

Having transacted other business, the Council adjourned at 8.30 until January 24.

### Illustrations.

#### NEW TOWN-HALL, COLCHESTER.

**THIS** view of the new Town-hall, of which Mr. Belcher is the architect, is the drawing which was exhibited at the last Royal Academy. We gave the plans of the proposed building, and a description, at the time of the competition. (See *Builder*, September 4, 1897.)

#### THE TOWER, COLCHESTER TOWN HALL.

MR. JOHN BELCHER'S working drawings for this tower were exhibited at the Royal Academy. In order to obtain a satisfactory silhouette on the angle as well as on the front elevation, it has been drawn from both points.

The upper part is designed for Portland stone. The four figures on the angles are proposed to represent some of the characteristics of the borough, such as its fishing, agriculture, engineering, and military occupations. The figure on the apex is that of the Empress-Saint Helena (holding the cross), who is said to have been born in Colchester.

The lower portion of the tower above the parapet will be in red brick and contain a clock whose chimes will, in due course, be fixed in the upper stage as shown. The clock face is intended to be in bronze with signs of the Zodiac and other suitable decorations.

The cost is estimated at 4,000*l.* exclusive of the clock and chimes—a moderate amount for work at its height from the ground.

This tower is the gift of the present Mayor, Mr. James Paxman, the well known engineer.

#### DESIGN FOR STAINED GLASS.

This design, by Mr. Arthur L. Duthie, was exhibited at one of the Royal Academy exhibitions some little time since. It represents, in a decorative form, the subject of "the Angels appearing to the Shepherds," and the upper portion (especially) of the design is a good example of the kind of treatment of figures that is most suitable for stained glass, the pictorial element being entirely avoided, and the figures treated in a free decorative manner in one plane. The Shepherds are a little more realistic, and do not quite harmonise with the Angels; but in the main it is a design of a character above the common-place conventionalities of stained-glass design.

#### MOSAIC DECORATION, GREEK CHURCH, BAYSWATER.

The illustration shows a portion of a cartoon for the mosaic decoration of the interior of the dome of the Greek Church at Bayswater, the shape of which, down to the sills of the twelve arched windows, is a complete hemisphere. The entire surface covered by the design is rather more than 4,000 square feet.

The centre of the design is occupied by a colossal figure of Christ seated on a rainbow with his arms extended in the attitude of bene-

diction; this figure is placed in a circle 24 ft. in diameter, which forms the inner edge of a broad band of ornament, in which are twelve cherubim with extended wings, which almost touch each other all round, whilst the lower edge is formed by twelve semi-circles which become canopies over the heads of each of the Apostles, whose figures, 10 ft. high, stand between the twelve windows, on a broad border running round the dome below the windows. In this border are inscribed, in the Greek character, the words "Holy, Holy, Holy, Lord of Sabaoth, Heaven and Earth are full of Thy Glory: Blessed is He that cometh in the name of the Lord; Hosanna in the Highest." The rest of the space down to the cornice is filled by a broad band of graduated blue mosaic.

The design is by Mr. A. G. Walker.

#### THREE HOUSES, LYNDHURST GARDENS.

THESE houses are built on a site at the corner of Lyndhurst-road and Lyndhurst-gardens, and, as may be seen from the plan, completely fill the whole available frontage. They are built in red brick with green slates and wood cornice. An existing cottage on the site has been used for the kitchen and scullery of the corner house.

The architect is Mr. Horace Field. The drawing was exhibited at the last Royal Academy.

#### MEMORIAL CROSS AND DRINKING FOUNTAIN.

THIS is a design for a memorial cross and drinking fountain proposed to be erected at Chorley.

The ecclesiastical character was a special feature, together with the large floreated cross. The material proposed is red sandstone and the figures are of white marble, the whole surmounted on three steps topped with granite. The water issues from the mouths of the lions into the large basin and thence into the smaller ones held by the figures, and then passes away.

The design is by Mr. L. Rycroft Oakes, of Manchester, and the drawing was exhibited at the last Royal Academy.

#### SANITARY INSPECTORS' ASSOCIATION.

At a general meeting of this Association, held on Saturday last at Carpenters' Hall, London Wall, a paper on "Food Adulteration" was read by Mr. W. H. Grigg (Fulham), one of the inspectors appointed under the "Sale of Food and Drugs Acts." Mr. J. T. Moss Flower (Bristol) presided. Before the lecturer was called upon, ten new members were elected, all inspectors representing provincial districts, eight in the employ of the Corporation of Belfast, one from Southend, and one from Shepton Mallet, Somersetshire.

After the customary vote of thanks and discussion of the points raised in the paper, the meeting was made extraordinary, when the following resolution, proposed on behalf of the Council by the Chairman, and seconded by Mr. G. T. Dee (ex-Chairman), was adopted:—

"That the number of members in the Association shall be increased by the addition thereto of 700 members beyond the present registered number."

#### COMPETITIONS.

**COLSTON'S HALL, BRISTOL.**—With reference to the competition for the restoration of the Colston's Hall, Bristol, the three premiated designs are as follows:—(1st, with premium of 100*l.*) Messrs. Frederick H. Jones & Erskine S. Cummings, Parliament Mansions, Victoria-street, Westminster, S.W.; (2nd and 50*l.*) Messrs. H. V. Lanchester, J. S. Stewart, & E. A. Rickards, of Bloomsbury-square, London; (3rd and 25*l.*) Messrs. George C. Lawrence & Harold Smith, General Assurance Chambers, Clare-street, Bristol. A review of the drawings appears in our first article this week.

**VAGRANT WARDS, PEWSEY WORKHOUSE, WILTS.**—The competition for vagrant wards to be erected at Pewsey Workhouse has been decided. The first premiated design is by Mr. Joshua W. Brooke, of Marlboro', and the second premiated design is by Mr. F. Whitmore, of Chelmsford.

**NEW FOUNTAINS FOR MANCHESTER PARKS.**—The Special Committee of the Manchester

Corporation appointed to arrange for the erection of the four fountains presented to the city by the late Alderman Clay have adjudicated upon the designs which had been sent in at the invitation of the committee. There were twenty-four competing architects and sculptors, and the committee selected the two designs submitted by Mr. J. W. Beaumont, architect, of St. James's-place, Manchester, and two fountains of each design will be erected. Each design consists of a canopy covering a basin of water, from the centre of which will spring a jet or jets of water, the basins for drinking purposes being placed on the outside of the base of the canopy. Small drinking troughs for dogs are also provided. The fountains will stand on three steps, and the ground round them is to be laid out for grass and flowers. In both designs the base will be of granite, in one case grey and in the other red, and the superstructure will be of red sandstone from the Corsehill quarries. It is a condition that the fountains are to be erected at a cost of 700*l.* each. They will be placed in Boggar Hole Clough, Queen's Park, Birch Fields, and Oak-road Park, Crumpsall.

#### ARCHITECTURAL SOCIETIES.

**EDINBURGH ARCHITECTURAL SOCIETY.**—On the evening of Wednesday, the 14th inst., Mr. G. Balfour read a paper on electric lighting before this Society. Mr. A. R. Scott occupied the chair.

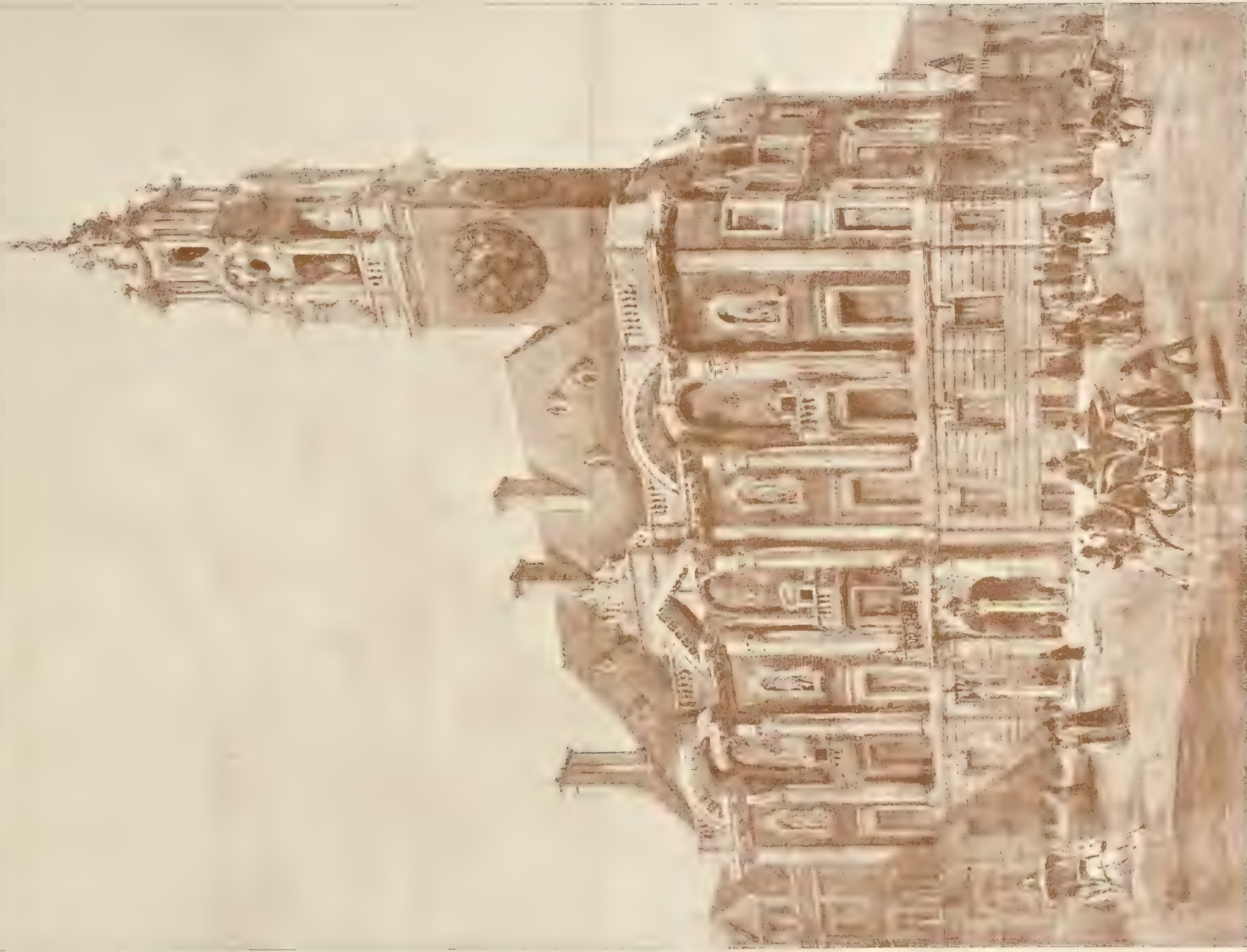
**EDINBURGH ARCHITECTURAL ASSOCIATION.**—A meeting of the Edinburgh Architectural Association was held on the 14th inst. in the Royal Institution, Princes-street, Mr. Thomas Ross, the President, occupying the chair. The Chairman referred to the death of Mr. Hamilton Beattie. Since they last met, a notable man, he said, had passed from among them. He was one of the oldest members of the Association, having joined so far back as 1861, and for many years he took an active part in its affairs. He was President for session 1866-67. He proposed that a letter of condolence should be sent to the family of Mr. Hamilton Beattie, and this was agreed to. Mr. Edwin Forbes then delivered a lecture on a year's work in Galloway in connexion with the School of Applied Art Studentship. After stating that it was scarcely possible to over-estimate the boon which the School of Applied Art was to those who had chosen architecture as their life work, he proceeded to describe Dundrennan Abbey, Glenluce Abbey, Lincluden College, Sweetheart Abbey, and Caerlaverock Castle, giving the history, traditions, and dates in connexion with each of these buildings. The lecture was illustrated with limelight views.

**LEEDS ARCHITECTURAL SOCIETY.**—At a meeting of the Leeds and Yorkshire Architectural Society, held in the Society's Rooms, Park-street, Leeds, on the 19th inst., a paper was read by Mr. Francis W. Bedford, entitled "Siena and Baldassare Peruzzi." The lecturer gave a description of Siena and of the country round. Its population, he pointed out, was only a quarter of what it was in the Mediaeval days. It was full of old palaces more or less in ruins. Its cathedral was in marble, inlaid with mosaics, and had statues by Michelangelo, Donatello, and paintings by Raphael and Pinturicchio. Its choir stalls were amongst the finest in the world. Mr. Bedford gave an account of the life and work of Baldassare Peruzzi, who, besides being an architect, was a skilled painter. The lecture was illustrated with lantern slides.

#### ENGINEERING SOCIETIES.

**THE INSTITUTION OF JUNIOR ENGINEERS.**—A meeting of this Institution was held at the Westminster Palace Hotel on December 9, Mr. Kenneth Gray presiding in the absence of the Chairman, Mr. B. H. Joy. The paper read was on "British Cable Tramways and their Construction," by Mr. E. A. Heath. For towns in hilly districts requiring tramway communication the author claimed that cable haulage had no rival. Being independent of rail adhesion, the steepest gradient could be ascended or descended with absolute safety, provided that for descending an emergency brake were employed which would grip the slot rails. A brake of this description was fitted to the cars on the Douglas tramway of a gradient of 1 in 10, and on those of the Matlock line, with a gradient of 1 in 4½. The system of constructing the track and cable-tube was described in detail. A very good fish-joint for track rails was



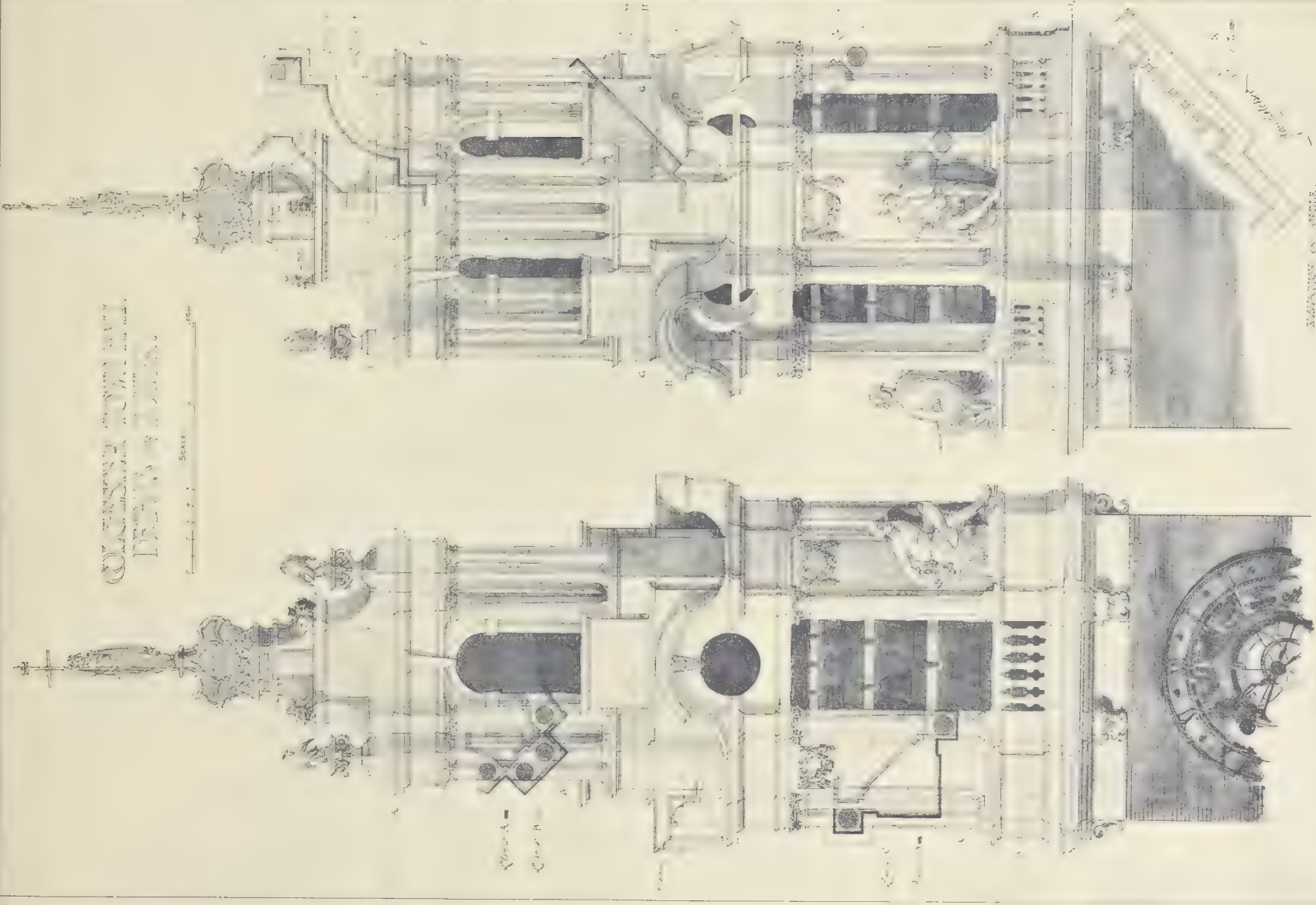


NEW TOWN HALL, COLCHESTER. MR. J. LEPPERS. J. R. L. A. ARCHT.





SECTION ON STAIR.

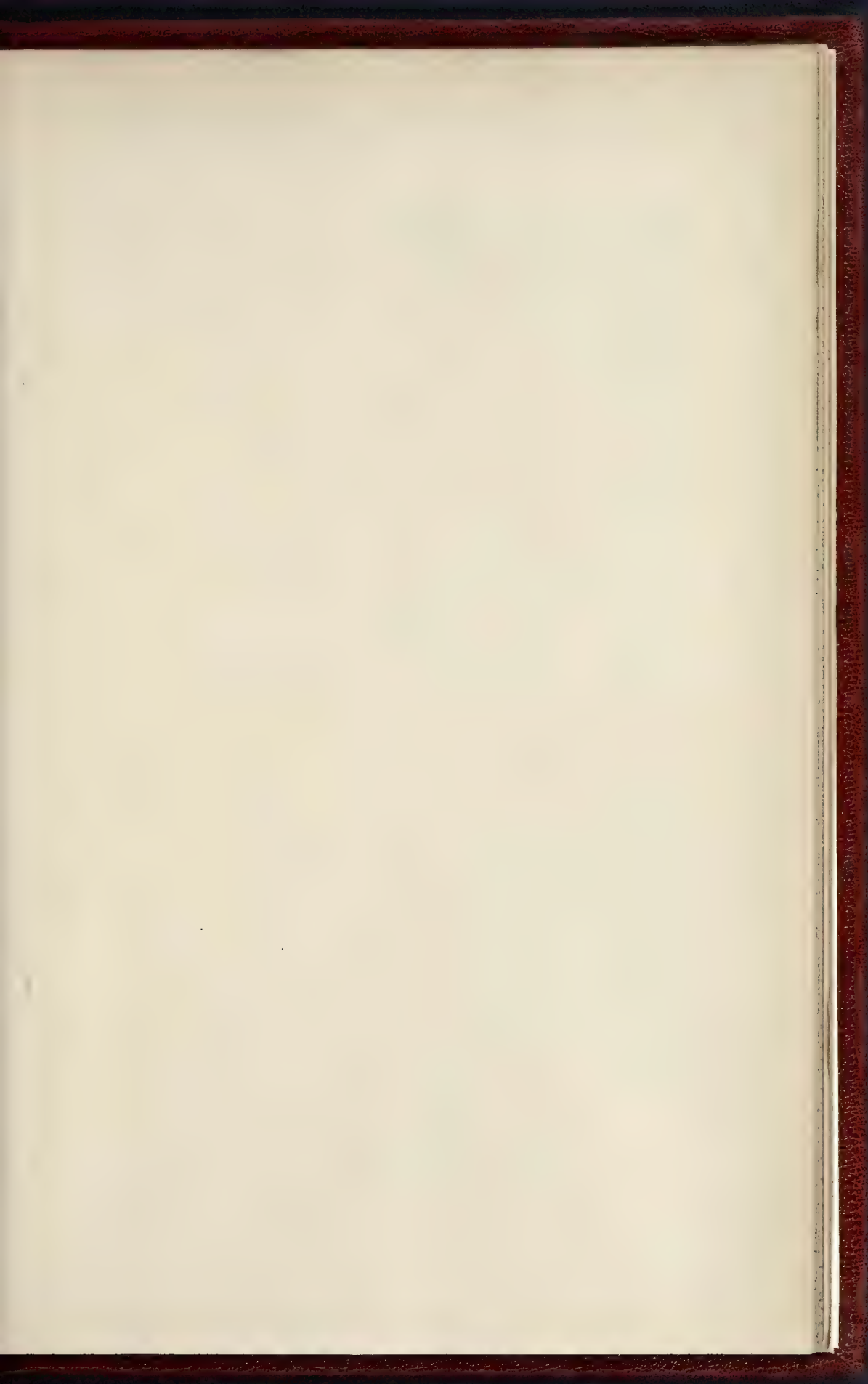


SECTION ON STAIR

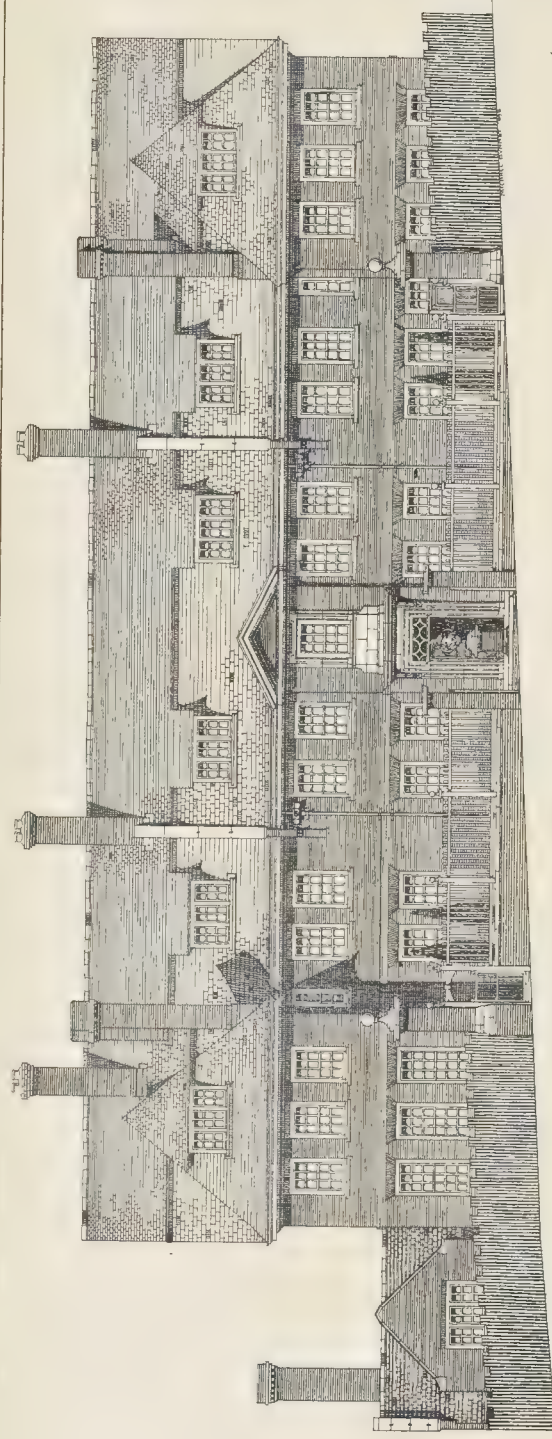
SCALE



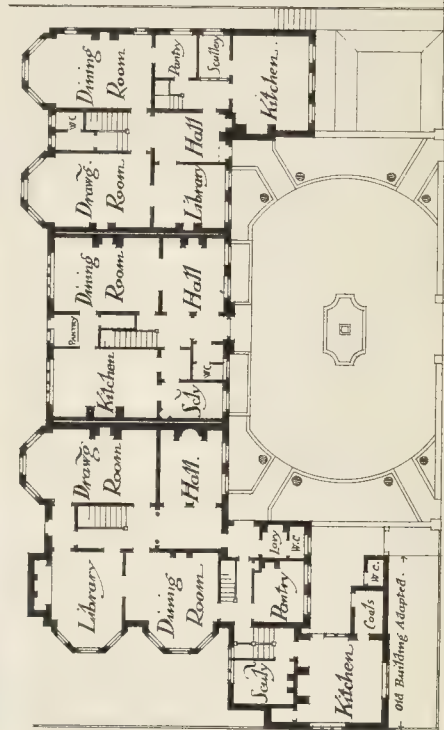




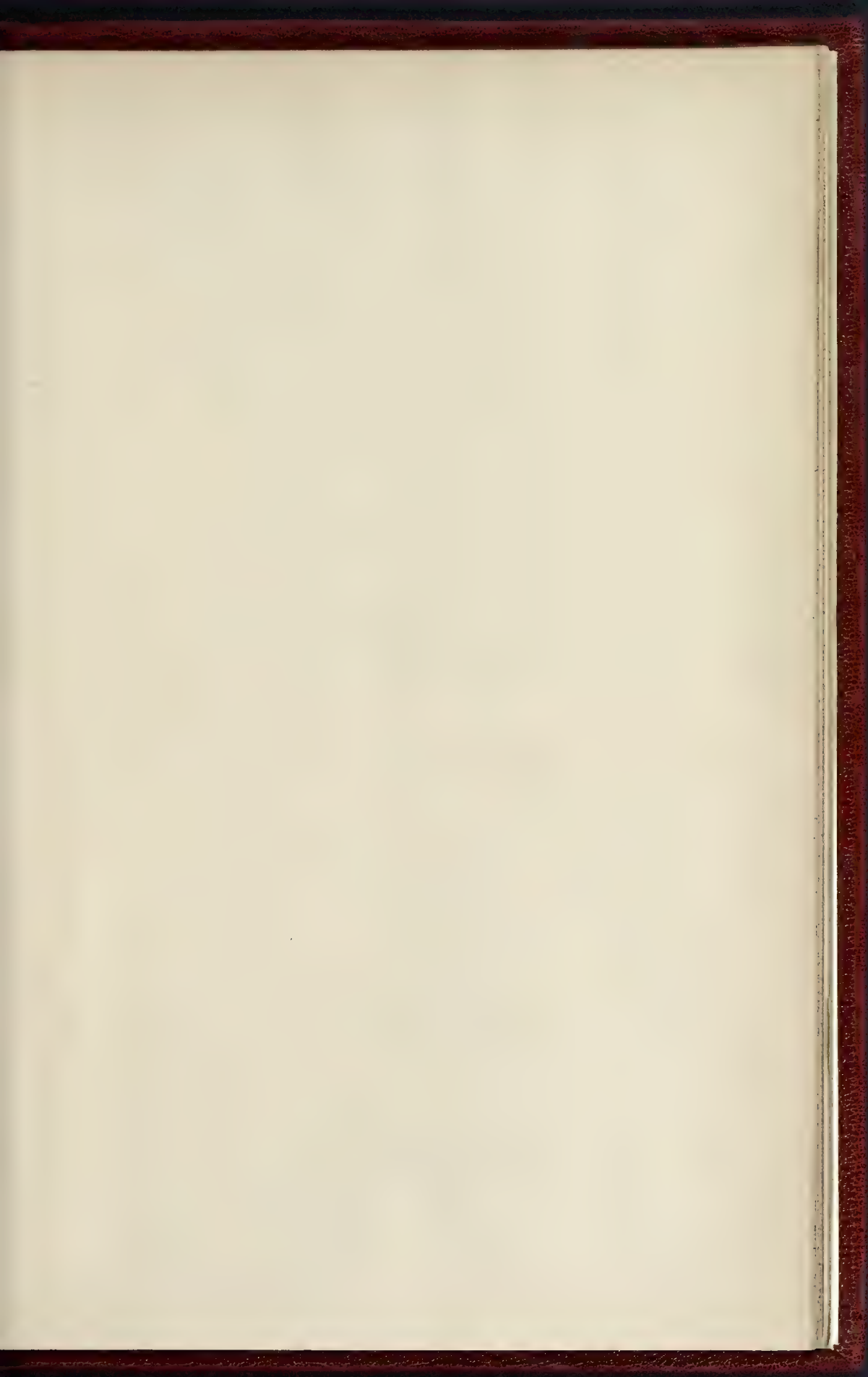
THE BUILDER, DECEMBER 24, 1898.



*An Elevation and a Plan of  
Three Houses at Hampstead  
for Russell Scott and Russell  
Rea Esquires: Horace Field  
Architect. 1898.*









DESIGN FOR STAINED GLASS ANGELS APPEARING TO THE SHEPHERDS —By MR ARTHUR L DUTHIE

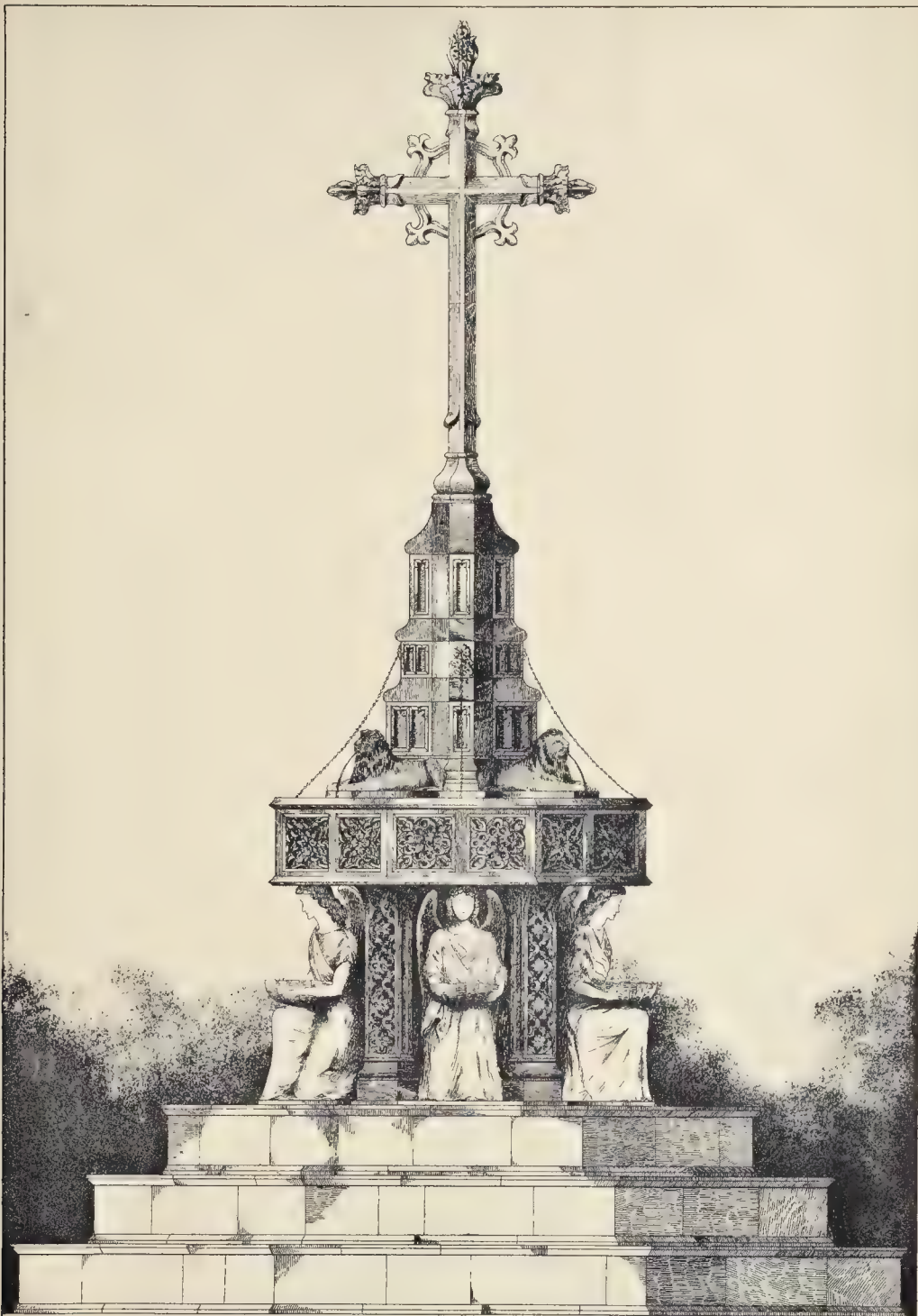




DESIGN FOR MOSAIC IN DOME, GREEK CHURCH, BAYSWATER—BY MR. A. G. WALKER







Design for a *Myerhoff & Co's*  
**Memorial Cross and Drinking Fountain**  
 Town's Green *Chorley*

*Scale of feet*





shown which formed practically a continuous running surface for the car-wheels. Approximate figures were given for calculating the horse power required to haul the cable; to arrive at anything approaching the actual figure mature experience had to be applied of the various conditions under which the tramway was to be operated. The special features in the construction of Highgate tramway, Streatham, Douglas, Matlock, and others were reviewed, particulars being furnished. In the discussion which ensued, Messrs. Julian R. Marshall, T. Meacock, Gentry, C. Lean, W. J. Hunter, H. B. Vorler, H. Durnall, R. Krall, A. P. Macalister, E. A. Barry, J. Pearson, L. H. Rugg, and W. J. Tennant took part. The proceedings concluded with the announcement of the meeting on January 27, when Professor J. A. Ewing will deliver a lecture on "Measurements of Elasticity."

#### ROYAL INSTITUTE OF ARCHITECTS OF IRELAND:

##### ANNUAL GENERAL MEETING.

On the 15th inst. the annual general meeting of the Royal Institute of Architects of Ireland was held at the offices of the Institute, 20, Lincoln-place. The President, Mr. Thomas Drew, R.H.A., occupied the chair.

Mr. Albert E. Murray, Fellow, hon. sec., read the annual report, which stated that the roll call now consists of twenty-seven Fellows, fifty-seven members, and six probationers, making ninety, all told. "We are glad to say," the report proceeded, "that our experience during the past year as one of the allied societies of the British Institute has been very satisfactory, and that our relations have been perfectly harmonious throughout. A concession has recently been made to provincial architects by the British Institute, and mainly at the suggestion of this Institute, to the effect that any member of the profession unanimously recommended by the council of an allied society will be practically approved a Fellow of the British Institute. We consider this a wise and liberal policy on the part of the central body. . . . We wish to draw attention to the fact that while both in England and Scotland a large number of allied societies, each having its centre and well-defined boundaries, have been established, Ireland shows on the map of the British Institute as a single province, with its centre in Dublin. The Council feel that this state of things is not creditable to the professional spirit of Irish architects, and trust that a movement may soon be initiated to establish local allied societies in Ireland, with spheres of influence and with other centres than Dublin, while fully maintaining their connexion with this Institute." . . .

On the motion of Mr. W. K. Parry, seconded by Mr. C. Geoghegan, the report was adopted.

The President then delivered an address, in the course of which he said that for fifteen years the Institute had existed, mainly as an elective council or standing committee, which had through that time assiduously watched the general interests of the profession, defending and asserting its position, and advising members in cases of professional difficulties and responsibilities, and, not least, once a year promoting by an annual dinner social intercourse and personal friendships. It seemed but the other day that the great body, organised and chartered as the Royal Institute of British Architects, was, through conservatism, falling out of touch with the vast body of architects that had grown up in the cities of the Empire at home and abroad since its early foundation. An executive localised in London, though composed of foremost and earnest men in the profession, had to realise that the membership and influence of the Institute was not extending as it ought, and some appeal was made to the *esprit de corps* of architects in the provinces as to their apathy towards the Institute. It was now a tribute to the fair-mindedness of the London Executive that it had by its acts in a marked degree adopted the views of the non-conforming provincial architects. He enumerated the advantages to provincial architects brought about by that course. The Council of the Institute had recently provided for members at 9, Conduit-street, London, a tea and smoking room, with writing materials and periodicals, and had invited country members visiting London to use such apartment for appointments and interviews with clients and others with whom they may have business; and it was their desire to

hold out some of the minor conveniences of a club. He expressed his opinion that it was now a desirable thing and a distinction, and a practically advantageous thing, for an architect to be on the roll of the central society. He trusted that more of their members, realising this, would offer themselves for election, and so increase their weight and influence. Continuing, he said he desired to suggest the appointment of a Standing Art Committee of the Dublin Institute, whose concern should be with public and civic improvements or disfigurements, architecture threatened with demolition, or degradation, or neglected, and to direct public attention to them with authoritative opinion. Outrages on the dignity and beauty of the streets, which were the common inheritance of all citizens, were too often perpetrated by the ignorance or selfishness of individuals or the density of official bad taste. Improvements which were possible and patent to the expert eye of the architect were dormant and unnoticed. Such an institution did good service in London in the form of a Standing Art Committee of the Royal Institute of British Architects. It took its stand as representative of the public Guild of Architects, which had a right to opinion in such matters. It had, he believed, extended its purview to Irish affairs, and had memorialised the Provost and Board of Trinity College that the fine work of Sir William Chambers should not be degraded by incongruous association in juxtaposition with brick building of the utilitarian artisans' dwellings type. To the cathedrals of Dublin it had given some intelligent interest. Surely there was a work to be done in this way in Dublin, and he believed it would be received well by the municipal rulers, who in Dublin at least were on kindly terms with its architects. For instance, he noted a casual reference at a late meeting of the Corporation to a scheme for providing office accommodation by, in some manner, dividing or utilising the grand circle under the dome of the City Hall, the work of Cooley, of which they were so proud. Looking down the Liffey to the western sunset from O'Connell bridge to one of the most exquisite pictures of Dublin landscape, they saw it marred, disgraced, and outraged by giant invitations to try somebody's bread or some one's aperient pills, or, until lately, an infallible epileptic remedy. He believed it might not be in the immediate power of the Corporation to abate this eyesore, but he believed public opinion directed to it would bring home to individuals who perpetrated such things, in ignorance, perhaps, that they give grave offence and disgust to a community far more widely than they estimate. Recently skeleton-sky signs began to appear in the best architectural streets of the city. Tramways and trolleys, posts and cantilevers, overhead wires were past praying against. The Juggernaut of Progress passed by, and sorrowing architects should bow; but much of the beauties of cities, in Dublin, and very noticeably in newer Belfast, might have been saved to them if such a public body as a society of architects had watched over them. There just existed now, in a last stage of degradation and neglect, the last surviving hall of the twenty-four guilds of which the Corporation of Dublin was constituted fifty-six years ago—the Weavers' Hall in the Coombe. It was an interesting and fine old Queen Anne or Early Georgian hall, which it is a disgrace to the city to allow to disappear. If architects do not find it out and direct public notice to it, who will do it? When he touched on the up-river disfigurement some visitors might have wondered that a down-river disfigurement which freshly shocks their sense—the notorious Loop Line outrage—was not alluded to. It was because it was for Dublin architects ancient and painful history. It was a memory of that needless outrage of the beauty of a beautiful city, of the obstinate engineering doggedness which forced its way through public thoroughfare to the west instead of the east of the Custom House, of the irresponsible tyranny of wire-pulling in such projects. The architects of Dublin, appealed to by the Press, took their part at the time in leading a protest against what seemed a proceeding almost incredible in its extent and ill-design. It pointed the moral of the necessity of some volunteered censorship to defend the rights of citizens in their own city. To no architect can that ill-starred blot upon the city of Dublin be ever anything but a distress—with its ragged-ended rusty girders above, and its manifestly sham and inadequate pieces of foolish architectural pretensions below, its five specimens of abso-

lutely differing and incongruous pieces of bridge-building going to make up one quarter of a mile of a continuous viaduct. It could only be said, in language not unfamiliar in the annals of crime, "No one was brought to the bar of justice in connexion with that shocking crime. The real perpetrators may be still alive and walking in our midst, but in all human probability will never be discovered." In conclusion, he said he now vacated the chair with a sense of the friendship, and loyalty, and unselfish co-operation of colleagues through a long term of years, such as he believed had never been accorded to any President of a like society to theirs.

Mr. Walter G. Doolin thought that the best thanks of the meeting were due to the retiring President for his address.

This having been heartily agreed to, Mr. J. Rawson Carroll moved the appointment of a Standing Art Committee, as outlined by the chairman.

Mr. William M. Mitchell seconded the resolution, which was carried.

The result of the election of officers was made known as follows:—Mr. Thomas Drew was re-elected as President; Mr. A. E. Murray was re-elected as secretary and treasurer. The following were elected to the council:—Messrs. Mitchell, Carroll, Penland, Ashlin, O'Callaghan, Geoghegan, Parry, Doolin, Orr, and Bachelar. The proceedings soon afterwards terminated.

#### METROPOLITAN ASYLUMS BOARD.

SIR EDWIN GALSWORTHY presided on Saturday last at the fortnightly meeting of this Board, held at the County Hall, Spring Gardens.

*A Claim by Contractors.*—A City firm of solicitors wrote on behalf of Messrs. Kirk & Randall, contractors, making a claim of 34,445*l.* on account of delays in the erection by them of the Grove Hospital, resulting from the supply of drawings, the supply of imperfect drawings, and delay in the supply of drawings by the Board's architect. The letter intimated that the variation account was being prepared as rapidly as possible, and that further claims would be sent in when it was complete.—Mr. A. C. Scovell moved and Captain Andrew seconded, that the matter should be referred to the Works Committee, with instructions to take the advice of the Board's solicitors. Mr. Brass considered that before going to law they ought to have a report on the subject from the architect. Mr. Edward White pointed out that as the Board did not meet again for a month, the matter might become more serious if no action were taken. After further discussion it was agreed that the committee should have "power" to take legal advice.

*An Obsolete Hospital.*—The Local Government Board having written asking how it was that the cost of maintenance of the South Western Hospital was 86*l.* per bed per annum, against 65*l.* at the "Fountain" Hospital, the Finance Committee submitted a report embodying a statement on the subject by Dr. Caiger, the medical officer. While the Fountain Hospital, said the doctor, was a modern building on a comprehensive plan, with central administrative buildings arranged for economy and convenience, the South Western was planned nearly thirty years ago, as two institutions, each with its administrative centre. Its offices and departments were unduly extensive, numerous and scattered, causing a great increase of work. Its wide, covered-in corridors needed a little army of scrubbers and window-cleaners (while the modern covered way with asphalt path only needed the weekly application of the hose and squeegee). Most of its wards were for thirteen beds, needing a minimum staff of four nurses, while at the Fountain six could deal with twenty-six beds. For the same reason more than double the number of ward servants were needed to do the same work. Duplicate laundries caused unnecessary engineering labour, and the comparatively small number of beds increased the cost per bed of the salaries of the medical and general staff. The South Western Hospital Committee pointed out that if the Board had adopted the scheme of reconstruction presented to them in 1894 much of the excessive cost of maintenance would have been saved.—The Finance Committee made a proposal, the consideration of which was adjourned, that an official should be appointed to advise on administrative control, and a medical officer to advise on medical



matters, with a view to the construction of buildings with a "maximum efficiency of working."

**Appointment.**—Messrs. A. & C. Harston were instructed to prepare plans and specifications for a new laundry and boiler and engine-house at the North Eastern Hospital at a cost roughly estimated at 12,000l.

#### COURT OF COMMON COUNCIL.

A MEETING of the Corporation of London was held at the Guildhall on the 15th inst. The Lord Mayor presided.

Mr. Edward Lee presented a petition from the Charing-cross and Strand Electricity Supply Corporation (Limited) stating that they were desirous of supplying electrical energy within the whole of the City and its liberties, and duly made application for the assent of the Corporation to such powers being granted. They pointed out (1) that monopoly of supply by any one company was adverse to the interests of the ratepayers and the public; (2) that the rate charged for the supply of electric energy by the petitioners was very considerably less than that charged within the City by the present supplying company; (3) that their service was steadier, more economical, and efficient; (4) that the low tension distributing system was safer for many reasons—among others, the avoidance of fire-proof transformer rooms or apparatus on the premises supplied with energy; and (5) that the low tension current system appeared *inter alia* to be the best adapted for arc lighting and motive power purposes. The memorial was signed by over 5,000 persons carrying on business in the City, including twenty-nine bankers, eighty-one insurance companies, and eighty-two newspaper proprietors. The petitioners had been informed that the Corporation found themselves unable to assent, but they asked that, notwithstanding such inability, the Corporation should cause the memorial to be put upon their records. Replying to questions by members, the petitioners said they would not be able to supply the public lamps cheaper than 2½d. per unit, the present rate. They desired to enter the City for the purpose of giving light to the signatories to the memorial and others. The desire to make a profit for their shareholders out of City lighting incidentally entered into their calculations, as they did not claim to be philanthropists. Being asked if they knew that 7,000 consumers now obtained their electric light from the existing monopoly, they said there would be 30,000 consumers if a healthy competition were permitted. They hoped to charge a maximum of from 4d. to 5d. per unit for private electric lighting, and from 2d. to 3d. for motive power. The memorialists and others were dissatisfied with the present price, and if the company were permitted to undertake business in the City they would accept any reasonable conditions which might be imposed on them.

On the motion of Mr. Lee, seconded by Mr. A. C. Morton, it was agreed that the memorial should be referred to the Streets Committee for consideration and report.

The Improvements and Finance Committee submitted for adoption an arrangement for setting back the premises in Lothbury between Old Jewry and Prince's-street for 36,586l., to include all interests, the vaults being constructed at the expense of the Corporation. This was agreed to.

At the instance of the Library Committee it was decided to print and publish a catalogue of the museum at the Guildhall at a cost of 400l.

After the transaction of some other business the Court adjourned.

#### HUDDERSFIELD MASTER BUILDERS.

ON the 10th inst., the annual gathering in connexion with the Huddersfield and District General Builders' Association took place at the Town Hall. At 5.30 the members met in the Council Chamber to transact the annual business. The chair was occupied by the Mayor (Alderman W. H. Jessop, J.P.). The fifth annual report, which was read by the Secretary (Mr. Walter Jury), was adopted, on the motion of Mr. Alfred Crowther, seconded by Mr. J. H. Taylor. It stated that during the past year six employers had joined the Association, making the membership into a total of sixty-nine. Early in the year complaints were made to the committee that the working hours for the winter portion of the year for the operative masons and labourers were anything but satisfactory, and the committee de-

cided to invite the operatives' representatives to a conference with a view to an adjustment of the hours for the present winter on a more satisfactory basis. The committee regretted that the operatives declined the invitation on the ground that any alteration of rules must be subject to the "six months' notice." The carpenters and joiners had given notice of a demand for an advance of wages from 7½d. to 8½d. per hour, and the matter would have to be dealt with by the employers of the branch concerned. With respect to the other branches of the building trade, the relationship between operatives and employers seemed to be of a cordial aspect. Mention was made in the report of the formation of an exchange for the use of members of every department of the building trade, including merchants and dealers in building materials, iron merchant, &c. At the opening in September last there were 160 members, and the roll had been increased in a most surprising manner to nearly 300. The committee had no doubt that the existence of such an institution would tend to the advancement generally of the building trades. The balance-sheet, submitted by the treasurer (Mr. T. B. Tunncliffe), was also adopted, and the following were elected as officers for the ensuing year:—President, Mr. John Dawson (of the firm of Messrs. Dawson & Jones, contractors); hon. Vice-Presidents, Alderman W. H. Jessop and Mr. Abraham Graham; Vice-Presidents, Messrs. Alf. Crowther and Lewis Radcliffe (Messrs. J. W. Radcliffe & Sons); Treasurer, Mr. T. B. Tunncliffe; Secretary, Mr. W. Jury; Auditors, Messrs. A. H. Huddersfield and J. E. Kaye; Committee, Messrs. J. W. Mallinson, A. Schofield, Abraham Graham, jun., W. Hirst, W. Blakeley, D. Light, E. Boul, A. W. Garside, G. H. Day, S. Kendall, W. B. Evans, John Cooke, F. Milan, J. Brown, and J. W. Longbottom. Alderman Kendall moved, and Mr. J. H. Taylor seconded, a vote of thanks to the retiring officers, which was carried, and Messrs. J. W. Mallinson, T. B. Tunncliffe, and L. Radcliffe were appointed representatives on the Yorkshire Federation of Master Builders. At the conclusion of the meeting the members adjourned to the Mayor's reception room, where dinner was provided. The company numbered seventy-five. The proceedings were presided over by the Mayor. Mr. J. H. Stutter proposed "Success to the Town and Trade of Huddersfield," and Alderman J. Lee Walker replied. Mr. Alfred Crowther made a few supplementary remarks. Mr. J. H. Taylor next proposed "Success to the Yorkshire Federation." He remarked upon the great value of the Yorkshire Federation of Master Builders' Associations, and said that the organisation was not for offensive but for defensive purposes. They were not desirous at all of trying to lay down any arbitrary rules against the workmen, but what they insisted upon was that they should have a fair field and no favour, and that all matters should be equitably dealt with from both the employers' and employees' sides. The Federation had done a great deal of good on behalf of those interested in it, and it was to be hoped that through its influence controversial matters affecting the trade would be dealt with and settled in an amicable way. Mr. G. W. Mallinson, in acknowledging the toast, observed that the Federation was yet in its infancy, but it had already made rapid strides, and nearly every town and village in Yorkshire was now embraced by it. Mr. John Dawson also replied. He appealed to all associated with the local trade to join the Association, so that it might be given increased strength to resist that which was unjust and to yield to that which was right. Mr. H. Waddington gave the toast of "Success to the Huddersfield Employers' Accident Assurance Company." He was glad to hear that their company was going on successfully, and he understood that they had something like 2,000l. in the bank ready for emergencies. The Workmen's Compensation Act was, after all, probably not going to be such a very dangerous and fatal thing for the building trade as was at first surmised. He believed that the premiums in regard to insurance against claims for compensation would be considerably modified in the near future so far as the building trade was concerned, and he believed that if the members of the Huddersfield Association continued to work closely together they would find that the balance to the credit of their assurance scheme would continue to increase. Mr. C. Wheawill (secretary on behalf of the insurance scheme) responded, and endorsed the remarks of Mr. Waddington concerning the probability of the Compensation Act not being so serious a thing as was originally thought, and the idea of a reduction of insurance premiums. There was, he added, every probability that before long there would be legislation to cover the defects of the Workmen's Compensation Act, so that it was perhaps advisable that a move should not be made from the present rates of insurance, but that things should continue as they are for a time, and until it was more easy to decide what should be done. Mr. C. Stones next submitted "Success to the Huddersfield Builders' Exchange." It was something marvellous that there were now 280 members of the Exchange which was opened only on September 1st last. Not only was it a financial success, but he learned that contractors and others found it was a very great boon to them in many ways. He hoped it would continue to prosper, and that at the next meeting there would be a membership of 400

announced. Mr. John Pyrah, in reply, emphasised the remarks as to the success of the Exchange, and said that the more the representatives of the various branches of the building trade came in contact with each other the better would they understand each other's interests and the better would it be for trade at large. Other toasts followed.

#### BOOKS RECEIVED.

OBSERVATIONS ON VITRUVIUS.—By Professor T. Ussing. Translated from the Danish and revised by the author (Published by the Royal Institute of British Architects).

THE EFFECT OF FIRE: a report on the Howe Building Fire, Pittsburg. (British Fire Prevention Committee).

SMALL ACCUMULATORS: How Made and Used. (Dawbarn & Ward).

#### DIARIES, &c., FOR 1899.

MESSRS. HUDSON & KEARNS (83, Southwarke-street, S.E.) have sent us some specimens of their excellent and justly appreciated diaries and blotting-pads. The many merits of these publications, and their special value to architects, builders, and others, are so well known that it seems unnecessary to refer to the works in detail; we may, however, remark that the diaries are, generally speaking, well up to their usual standard of excellence, while the blotting-pads are as good as ever. The diaries again contain a list of cases decided in the superior Courts of Justice during the legal year (from November, 1897, to August, 1898) collected by Mr. J. Shearwood, Barrister-at-Law; a complete list of metropolitan surveyors and districts, with official and private addresses; revised regulations under the London Building Act; and other matters of interest to the profession, as well as the usual postal, &c., information contained in a diary. The section entitled "Architecture and Archaeology," containing the names of officials of architectural and other professional societies, still needs some revision: for instance, the 1897-98 list of officers of the Architectural Association appears, and one or two provincial societies are not mentioned at all. "The Architects' Diary" is again issued in two sizes, Nos. 12 and 13 (one and two pages to a day respectively), and the "Builders' Diary," No. 11, contains useful tables, &c., for builders. The date-indicating blotting-pads are very well got up, and leave little to be desired.

"Sprague's Pocket Diary and Architects' and Surveyors' Memorandum Book" for 1899 (Sprague & Co., East Harding-street, Fetter-lane) is the annual re-issue of a useful and neat little pocket diary. It has sufficient space for short memoranda for each day in the year, and, in addition, there are a good many pages of architects' tables, &c.

Messrs. Waterlow Bros. & Layton, Limited (Birch-lane, E.C.), have sent us the 1899 edition of their "Architects', Surveyors', and Auctioneers' Diary and Almanac." The publication contains a great deal of useful information to architects, surveyors, and others, including lists of Fellows and Associates of the Royal Institute of British Architects, Surveyors' Institution, Institution of Civil Engineers, Auctioneers' Institute (not "Institution," as it appears in the diary), District Surveyors, &c.; a digest of the principal Acts relating to buildings, &c.; London County Council By-Laws, London Building Act, 1894; and other information useful to professional men. The diary is a very useful one, and is, generally speaking, up to date and reliable.

"The Mechanical World" Pocket Diary and Year Book for 1899 (Eumott & Co., Limited, New Bridge-street) is the twelfth year of publication of a handy little diary. It is cheap, well printed and arranged, and contains a great deal of information of special use to mechanical engineers.

"The Indian and Eastern Engineer" Diary (Calcutta, and 50, Fenchurch-street, London) we have favourably noticed in previous years. The diary contains information of particular usefulness to professional men in India.

"The Railway Diary and Official Directory for 1899" (London: McCorquodale & Co., Limited) has again been sent us. The publication contains all the useful features of past issues.

"The Gloucester" Diary and Directors' Calendar for 1899 (F. J. Brooke, Gloucester, for the Gloucester Railway Carriage and Wagon Company, Limited), is the fourth year of issue of a very handy little publication.



'Messrs. Bemrose & Sons, Limited' (23, Old Bailey, E.C.), have sent us the Poetical Calendar, the Shakespearean Easel Calendar, and the Monthly Diary for 1899—each published at 1s.

The Rugby Portland Cement Company have issued a date indicator showing views of their works, &c.

## Correspondence.

To the Editor of THE BUILDER.

### THE DECORATION OF ST. PAUL'S.

SIR,—Is it too late to raise a word of protest against the decorations now being executed under the dome of St. Paul's?

This work is so well praised, both by its author and by the journalist, that one almost fears the sound of one's own voice in protest against what I believe to be the wanton desecration of the art of Wren.

It may safely be admitted that the colour of the stonework of this noble building is beautiful in itself, yet every available square inch of this stonework, where not already covered by mosaic decoration, is overlaid with red painted ornament, giving to the stonework a dirty red appearance and robbing the whole building of its dignity of structure. Moreover, new panels are being cut in the stonework and paterae, and other ornaments are being planted on. Metal letters have also been fixed on the faces of the arches supporting the walls beneath the dome.

Surely Sir Wm. Richmond should be content with the inestimable privilege conferred upon him of decorating our great cathedral, a boon previously denied to many far greater artists than himself, and should leave alone that which he cannot improve but which he may easily destroy—the structural beauty of St. Paul's. ARCHITECT.

### CLERKS OF WORKS AND THEIR SALARIES.

SIR,—Having become aware of the apparent tendency there is to lower the salaries of clerks of works, I shall deem it a kindness if you will allow me space to put forward in your valuable paper a few reasons why such men should be paid at a somewhat higher rate than they are at the present moment.

In the first place, a clerk of works' knowledge and experience should be such that he is able to read a set of plans at once, and have that keen perception which enables him to grasp the whole situation of any undertaking and his architect's requirements in the shortest possible time. He should be in the eyes of the architect and building owner likened unto Caesar's wife, "above suspicion." He is held responsible for the practical and sometimes theoretical good results of the work carried out, therefore he must of necessity be an all-round and reliable man and a thorough master of his work, whose opinion should be indisputable.

Glancing at this, one might be apt to say that this does not warrant a clerk of works being paid at a higher rate than he is at the present time; but let us go into the matter a little further. Take a new structure which is to cost 100,000l. or 80,000l., and the erection of which will take longer than twelve months. A clerk of works for such a work receives the princely wage of, say, from three guineas to four guineas per week, and is considered by many to be well off. Five guineas nowadays appears to be an exceptionally high wage on large works. I know of a large building which is just completed, the cost of which was something over 250,000l., where the clerk of works only received 4l. 4s. per week.

Now, the fact that a clerk of works on works of such magnitude practically has to pass work to the value of 100,000l. or more per annum, and be answerable for many sins which could mainly be ascribed to the architect, is sufficient alone to warrant his being paid thoroughly well for his labours. During the construction he feels the keen sense of his responsibilities; he is at the beck and call of all on any part of the works for an *authentic* opinion and advice regarding the various work being executed; he has to know at a glance if the mechanics are doing their work in a correct manner and carrying out details according to specification. Now, when one considers the wages taken by mechanics and finds the average clerk of works does not draw a wage even equal to two of such men (who, during ordinary working hours for the week, each draws his 2l. 8s. 6d., to say nothing of his overtime), one is led to suppose that a clerk of works' duties and responsibilities are not worth more than two mechanics at the outside. Such mechanics have little or no difficulty in obtaining employment when they go from works to works, but a clerk of works may probably have to stand still for some time before he can hope to obtain another berth after the completion of a building, and even before he does get another he has to satisfy the architect that he is in every way capable and trustworthy. I think this is a point which should be strongly considered, as he should at least

be in a position to put away a little for such unavoidable occasions. Overtime is not in all cases recognised for a clerk of works, although he is supposed to remain on the works during the time any men may be working; and if he is fortunate enough to get a small gratuity upon the completion of the works, which is entirely at the option of the architect or building owner, and is a rare occurrence, it is rarely equal to the amount of overtime worked in order to try and bring the whole work out satisfactorily.

I must say that I do not think it is always the fault of architects or building owners that the present low wage is paid; it is more often the fault of clerks of works themselves, who will take a berth at a far lower rate than another, who, in order to keep up as far as possible the clerk of works' standing, will willingly stand out for what he considers right and just.

Sow an act and you reap a habit.

Sow a habit and you reap a character.

Sow a character and you reap your destiny, which in this case means utter insignificance.

Take one instance; on one occasion I was selected by an architect to occupy the position of a clerk of works, at a salary of four guineas a week, on a certain building, the cost of which was 80,000l. Everything was practically settled providing the committee agreed to appoint me, when, to my surprise, in a few days time, I heard from the architect that my services would not be required, as he had obtained another man (who, by the way, was then a member of the Clerks of Works Association), who was willing to take up the duties at a salary of three guineas per week.

This, I am sorry to say, has been to my knowledge frequently the experience of other clerks of works.

Therefore, I consider the responsibilities of a clerk of works should be realised more fully, and their salaries should be more on the lines of percentage according to the magnitude of the works to be carried out, and a minimum wage paid.

A CLERK OF WORKS.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—XXV.

HEAT: FUSION (continued).

IT is not always easy to determine the exact moment when a substance fuses. Iron, for instance, does not pass suddenly from the solid to the liquid state, but first softens, and, whilst the temperature increases, yields very slowly. With such materials it becomes a question as to whether the final point of yielding is to be regarded as the melting-point, or whether that ought not to be fixed at the first indication of softening. The latter is the method adopted in this country, but it ought not to be defended from a scientific standpoint. For, although we are accustomed to speak of the melting-point as a fixed quantity, determined by a sudden change, that change is in reality gradual, though its outward manifestation may be sudden. Softening, in this sense, is merely a change, not of a relative character, but is an alteration in position of the molecules of the mass. The molecules lose some of their cohesion and are gradually, by increase of temperature, made to realise that they may have to part company, but that action is not consummated until the truly liquid form is attained. Arguing from analogy of similar substances in which that consummation takes place more rapidly, we should say that the true melting point is at that stage when the last vestige of solidity has disappeared, when the molecules have really been divorced from each other. This is not the view generally adopted by physicists, but it seems more in accordance with the definition of fusion in regard to the majority of other substances. Glass is another of those materials which soften before finally passing into the liquid state.

The student may think that such a matter is not of much practical importance, but from a manufacturing standpoint it is very essential. The question as to whether a certain alloy is to be tough or brittle, as the case may be, frequently hinges on the correct determination of a point like this. The identity of many chemical compounds is very often fixed by the same process.

It is a remarkable circumstance that alloys are generally more fusible than any of the metals of which they are made. Certain metals will only make an efficient alloy when mixed together in definite proportions, whilst others, especially those having low melting points, will combine in all proportions. Thus, tin and bismuth, possessing low melting points, combine in any proportions, a very small proportion of bismuth imparting to the tin more

hardness, sonorosity, lustre, and fusibility. Alloys of tin, bismuth, and lead are more fusible than those containing only two of them. The special advantages of these alloys are their employment in ascertaining a given temperature; for making easily melted plastic metals, in order to obtain casts of delicate objects which may be damaged by too high a temperature; for making very fusible soft solders; and, lastly, as a matter of precaution, for such apparatus as is liable to be instantaneously destroyed by a sudden and excessive increase of temperature; in this connexion may be mentioned the fusible safety plugs of boilers, which were formerly very extensively used.\* When cadmium is added to any of these alloys they melt at a still lower temperature. It is difficult to obtain these alloys in a perfectly homogeneous state, as they have a tendency to become decomposed whilst solidifying from a state of fusion, the lead tending to become deposited.

Cadmium also possesses a general property, of a most valuable character, in lowering the melting point of several other alloys. Indeed, some of them are readily fusible in boiling water. Contrasting this metal with bismuth, it may be noted that cadmium does not render the alloys so crystalline and brittle as bismuth. The chief use of cadmium is in readily fusible alloys, such as are used for soldering purposes. Mercury added will make the melting point of such alloys still lower. But we will not pursue this subject further, as it will trespass on the domain of metallurgy.

### Solidification.

This term implies the passage of a body from the liquid to the solid state. The two laws regulating this phenomenon, in the words of Ganot, are:—

I. Every body, under the same pressure, solidifies at a fixed temperature, which is the same as that of fusion.

II. From the commencement to the end of the solidification the temperature of a liquid remains constant.

There are exceptions to these laws, especially in regard to fatty substances, some of which seem to undergo a molecular change, which alters their melting point. The second law depends on the fact that the latent heat absorbed during fusion becomes free at the moment of solidification. Generally speaking, bodies which pass slowly from the liquid to the solid state assume regular forms. Some physicists allude to these forms as "geometrical forms"; those who know anything about mineralogy are aware that this is not true. For the vast majority of crystals (for these are the forms implied) have not even plane surfaces, some being curved, others pitted, or with minute projections; solid edges bevelled not by multiple faces but really and truly bevelled off, or true geometrical forms may be caricatured almost beyond recognition. It is ridiculous for people to imagine, as chemists and physicists so frequently do, that a crystal is necessarily a geometrical form, bounded by plane surfaces, and a definite quantity. Nature will have none of these things, and absolutely refuses to be bound by a simple series of geometrical laws. There are more exceptions with minerals to crystallise in the six systems ordained by the up-to-date mineralogist, than there are to the methods of conjugation of even such erudite things as German and Russian verbs.

When crystals are formed from a body in fusion, the crystallisation is said to take place by the "dry way." When a solution saturated at a higher temperature is allowed to cool slowly, or when the solution of a salt is evaporated slowly, and crystallisation takes place, it is said to be done by the "moist way." The point of solidification in a substance can be retarded by several processes. With water, for instance, the freezing point may be diminished by several degrees if the water be previously boiled, which frees it from air, and then kept in a perfectly still place. Atkinson records that it may be cooled even to—15 deg. Cent, and lower, without freezing, under such circumstances.

Again, rapid agitation frequently has the effect of retarding the point of solidification both in melting and freezing processes. Despretz lowered the temperature of water in fine capillary tubes to—20 deg. Cent. without its solidifying. This shows, as Ganot remarks, why many plants are able to survive severe cold without their sap becoming frozen, as the

\* "Mixed Metals." By A. H. Hiorns, 1890, p. 267.



sap is contained in very fine capillary vessels. If water contains salts or other foreign substances its freezing point is nearly always lowered.

#### Change of Volume.

In our preliminary observations on heat we observed that bodies expanded on being heated; but in such cases contraction takes place almost to the same extent, and the volume of the body after having undergone the operation remains, practically, the same size. Now, we have to note that under certain circumstances, especially when material chemical change takes place owing to heating in conjunction with hydration, the mass never contracts to its original size. This phenomenon may be exemplified by change taking place in a basic substance, whereby the constituents of great density become separated from those of less density, and the volume of the aggregate mass is thereby increased. The rate of expansion of bodies generally increases as they approach their melting points, and it is, in the majority of cases, followed by a further expansion at the moment of liquefaction, so that the liquid occupies a greater volume than the solid from which it is formed.

Again, chemical change, whether under the influence of great heat, or under ordinary temperatures, is promoted by the nature of the substance operated upon, and the net result of the alteration is nearly always a permanent increase in volume. Thus, if an iron railing becomes rusty (or further oxidised), and is allowed to keep on, its diameter in the end will be much greater than it was at the commencement.

#### SOUND, LIGHT, AND HEAT.—XXVI.

HEAT: CHANGE OF VOLUME IN SOLIDS AND LIQUIDS.

**T**HE laws of crystallisation were sketched in the last article, and certain means, principally pressure, of retarding the point of solidification were discussed. Now we will deal more particularly with the change in volume which takes place in solids and liquids in their passing from the solid to the liquid state, and *vice versa*.

Water expands at the moment of solidification, and contracts on melting, by about 10 per cent.

It is from this cause that leaden water-pipes are so frequently burst during frost. But the phenomena attending that are not as commonly supposed. The pipe is burst in this way. The first cools the water in the pipe to below its normal freezing point. The reason ice does not form is that there is no room in the pipe for it to do so, and the water is really kept below the freezing-point by the pressure due to its attempt to solidify, combined with its imprisonment in the inflexible pipe. As the temperature becomes still lower from without, the hydraulic pressure within the pipe is increased, and eventually has the effect of bursting the pipe, at which moment ice is formed in the breach, and acting as a plug effectually prevents any escape of water through the crack until thaw sets in, and usually has the effect also of stopping up the pipe itself.

Bombshells and cannon filled with water, and hermetically sealed, have been burst in strong frosts by the expansion of the freezing water within them. Ice forming at even two or three degrees below freezing point exerts an enormous disruptive force. The formation of ice at and near the surface of porous building stones is the prime cause of the decay of many of them. The stones are made to exfoliate, whereby the surfaces peel off, baring other surfaces which are similarly attacked in turn. The water in the pores of the stone, on turning into ice, expands, and loosens the cohesion of the particles which in the aggregate make up the stone. When thaw sets in, the particles do not come together again, their divorce being permanent, and thus become an easy prey to various other agents of denudation.

Metals, such as cast iron, bismuth, and antimony expand on solidifying, in the same way as water; but gold, silver, and copper contract.

Freezing mixtures are made by mixing together bodies which have an affinity for each other, and of which one at least is solid; such as water and a salt, ice and a salt, or an acid and a salt. The fusion or union of these bodies is materially promoted by their chemical affinity, and the artificial cold results from the absorption of heat in their passage from the solid to the liquid state.

#### Vapour.

The term "vaporisation" is defined by Ganot as the passage of a liquid into the gaseous state; whilst "evaporation" refers especially to the slow production of vapour at the free surface of a liquid; and "boiling" implies the rapid formation of vapour in the liquid itself. Under the same pressure, boiling takes place at a definite temperature; that is not the case with evaporation, which occurs even with the same substance at very different temperatures. In reference to the formation of vapour in a vacuum the following two laws are recognised—viz.: I. In a vacuum all volatile liquids are instantaneously converted into vapour; and II. At the same temperature the vapours of different liquids have different pressures. It has also been ascertained that when two vessels containing the same liquid, but at different temperatures, are connected, the pressure is identical in both vessels, and is the same as that corresponding to the lower temperature.

The last-mentioned author, in discussing the causes which accelerate evaporation of a liquid, divides them into four categories. These causes are—I., the temperature; II., the quantity of the same vapour in the surrounding atmosphere; III., the renewal of this atmosphere; and IV., the extent of the surface of evaporation. The "laws of ebullition" as determined experimentally are laid down as follows.—I. The temperature of ebullition, or the boiling point, increases with the pressure. II. For a given pressure ebullition begins at a certain temperature, which varies in different liquids, but which for equal pressures is always the same in the same liquid. III. Whatever be the intensity of the source of heat, as soon as ebullition begins the temperature of the liquid remains stationary. Again, Ganot remarks that the ebullition of a liquid is more retarded the greater the quantity of any substance it may contain in solution, provided that the substance be not volatile, or, at all events, be less volatile than the liquid itself. Water, which boils at 100 deg. Cent. when pure, boils at the following temperatures when saturated with different salts:—

Water saturated with common salt boils at 102 deg. Cent.; water saturated with nitrate of potassium boils at 116 deg. Cent.; water saturated with carbonate of potassium boils at 135 deg. Cent.; water saturated with chloride of calcium boils at 179 deg. Cent. And acids in solution present analogous results; whilst substances that are merely suspended in the water have no material influence on its boiling point.

Dalton's laws relating to the mixture of gases and vapours, as defined by Atkinson, are:—I. The pressure, and consequently the quantity, of vapour which saturates a given space are the same for the same temperature, whether this space contains a gas or is a vacuum. II. The pressure of the mixture of a gas and a vapour is equal to the sum of the pressures which each would possess if it occupied the same space alone. Regnault found that the pressure in air is slightly less than it is in a vacuum.

#### Hygrometry.

Hygrometry is the determination of the amount of water present in the air in a vaporous form. The air is never completely dry, and this circumstance, largely due to phenomena connected with the science of heat, has led to the establishment of more or less elaborate apparatus to assist in that determination. We can only note a few of them here and discuss the subject briefly and generally.

The "degree of saturation" is estimated on the knowledge that the air is never completely saturated; the ratio of the quantity of aqueous vapour actually present in the atmosphere to that which it would contain if it were saturated, the temperature remaining the same, is that "degree," and is often called the "hygrometric state." The instruments used for determining this state are known as hygrometers, which are broadly of three kinds.

The first of these, called direct hygrometers, depends upon the principle that the moment the temperature of any object falls below the temperature corresponding to the maximum tension of the vapour present in the atmosphere at the time, there will be a deposition of moisture upon it, which will at once be visible if the surface be of polished metal or of glass. The temperature at which this deposition takes place is called the "dew-point." A simple experiment, familiar to almost everybody, which illustrates this law, is that if a glass of cold

water be brought into a warm room, drops of water appear on the outside of the glass. This experiment is most successful in summer time; but it will be obvious that we cannot by that means satisfactorily arrive at the degree of moisture, as required by hygrometry in stating the dew-point. If we could, by a modification of this, include it in an apparatus, which could act as a measurer, all requirements would be satisfied; and that is what is done, practically, in the instrument devised by Daniell. That consists\* of two bulbs connected by a tube bent twice at right angles. One bulb is of black glass, the other is of ordinary glass, but is coated with linen. A thermometer is enclosed in the instrument, with its reservoir in the black bulb, of which it, therefore, shows the temperature. A certain quantity of ether is contained in the instrument. The mode of using the apparatus is to drop a little ether on the linen coating of the clear bulb. This, by its evaporation, causes the temperature of that bulb to fall, and makes the ether inside the instrument distil over from the black bulb, which in its turn falls in temperature, owing to the evaporation of the contained ether, and eventually becomes coated with moisture. The instant at which the moisture first appears on the surface of the black bulb is that at which the temperature of the enclosed thermometer should be read. That record of temperature is the dew-point. This experiment rarely fails, and is easy of demonstration. Another instrument, known as Dines' hygrometer, useful in rooms in which the dampness of the air must be very carefully regulated, is described by Scott as follows:—It consists of a vase fitted with a pipe at the bottom, which pipe is conducted close under a plate of black glass, where it envelops the bulb of a thermometer. A cock is fitted at the base of the vase. Very cold water, or ice and water, is put into the vase and the cock is opened; the glass speedily becomes dulled, and the thermometer is read. The cock is then closed again, the water in the tube soon rises in temperature, and the cloud disappears, the moment of its disappearance being that when the dew-point is again reached. The operation may be repeated as long as the water in the vase remains at a temperature below the dew-point.

The second kind or class of hygrometers, called "indirect," may be separated into two groups—the organic and the inorganic. Organic hygrometers depend on the well-known property of organic bodies to alter their molecular arrangement, or their appearance, according to their hygrometrical condition. Saussure's hair hygrometer consists of a long human hair, not fractured in any way, and which must be in a perfect state of preservation. Being kept fixed at one end, the other end is passed round a drum bearing an index, which records on a dial any elongation or contraction the hair may be subject under the influence of varying hygrometrical conditions. Catgut is often used in toys, illustrating the same phenomena. Of the inorganic indirect hygrometers we may only mention that devised by Sir John Leslie, improved by subsequent inventors, which is largely in use at the present day. This consists of two thermometers, of which one has its bulb coated with muslin kept moistened with water. The principle of the instrument, as explained by Scott, is that as long as the atmosphere is not saturated with moisture, evaporation will take place from any damp surface exposed to it, such as the moist coating of the wet bulb. If the air be saturated, no evaporation is possible, and the two thermometers will read alike; but if it be not saturated the temperature of the coated bulb will fall until it reaches a certain point intermediate between the temperature of the dry-bulb thermometer and of the dew-point. Once that limit is reached, if the supply of water be kept constant, the wet bulb will not change its indication unless the actual amount of moisture in the air varies. The facility with which this instrument may be used is not the least point in its favour; but, as will readily be understood, this type of hygrometer cannot be satisfactorily used out of doors in frosty weather.

The third kind, the chemical hygrometer, as described by Atkinson, consists, in principle, in passing a known volume of air over a substance which readily absorbs moisture—

\* Consult Scott's "Elementary Meteorology," 1883, p. 103; Ganot's "Physics," 1893, p. 377, and similar works.



chloride of calcium, for instance. The substance having been weighed before the passage of the air, and then afterwards, the increase in weight represents the amount of aqueous vapour in the air. This, and hygrometers of a similar kind, are very useful for demonstration purposes, but require too much attention to be of much practical use where a continuous record is desired. At the same time when care has been taken to make the chloride of calcium as dry as possible, so as not to be in any sense saturated by hygroscopic conditions obtaining before it is first weighed, excellent results may be calculated upon.

## GENERAL BUILDING NEWS.

**CHURCH, FULHAM.**—The new Church of St. Oswald, West Brompton, was consecrated on the 2nd inst. by the Lord Bishop of London. The site for the church has been given by Colonel Gunter, and the nave of the church has been built with temporary chancel. The style is late Perpendicular and the architect Mr. A. J. Hopkins.

**CHURCH RESTORATION, CHIDDINGSTONE.**—In commemoration of the Queen's Diamond Jubilee the parish church of St. Mary has been restored. The old high-backed pews have been replaced by open seats; new choir stalls of English oak have been placed in the chancel, which has been thrown open; the font has been removed from the central aisle, and replaced on the site of the old vestry; the old carved oak cover has been replaced and suspended by a balance chain; oak panelling has been erected round the chancel. The architect was Mr. McCartney, and the work has been carried out by Messrs. Maides & Co., of Croydon.

MEMORIAL CHURCH, BROCCO BANK, SHEFFIELD. —The Archbishop of York consecrated, a few days ago, the Church of St. Augustine, Brocco Bank, erected in memory of Archdeacon Favell. The style is Early English. The length is 133 ft., width 50 ft., and height 40 ft. The tower, which is the chief adornment, is 110 ft. high. Light is chiefly admitted through the clearstory windows. The whole congregation will be massed in the nave, the side aisles being only used as ambulatories. The accommodation at present is for 650, but when the cruciform transepts are completed, the church will be the addition of transepts the church will seat 750. A carved oak communion table has been presented by Colonel Catterall; a carved oak pulpit by Miss Eliza Favell; a Bath stone font with semi-relievo carving by Mr. J. R. Longden; a brass lectern by Mrs. Thomas Longden; and a carved oak altar by Mr. D. Webster, who has also presented the marble tessellated figure of St. Augustine, the patron saint, to be inserted in the pavement; a carved oak credence table by Mrs. and Miss Tozer, &c. Mr. J. D. Webster has been the architect. The contractor is Messrs. Thomas Tozer & Co. The work has been done the joining work, Messrs. Chadwick Brothers, the roofing, and Mr. Hickson, the plumbing.

RESTORATION OF CHANCEL, LONDONTHORPE.  
NEAR GRANTHAM.—A faculty has been applied for by the Trustees of the late Earl of Dysart for the restoration of the chancel of Londonthorpe Church. This part of the church, which is Perpendicular in style, has been very much in decay; so much so that it is imperative to include in the proposed work to be carried out: taking down the south wall with its traceried windows, sedilia, &c., and rebuilding the same: a new roof, with moulded and carved principals, covered with lead, and new flooring to altar-space in dressed red and white Mansfield stone. The new roof will be of the same height as the steps will lead up to the altar. In addition, the east window is to be reconstructed more in character with the church generally. We understand that the Trustees have placed the work in the hands of Mr. Charles Wm. Smith, of Grantham, who has prepared the necessary designs, and that the same will be carried out under the supervision by Messrs. Nichols Bros., builders of Oakham.

**PRIMITIVE METHODIST CHURCH, THORNABY.**  
YORKSHIRE.—On the 8th inst. the foundation and memorial stones of a new Primitive Methodist chapel were laid at Thornaby. The new church will seat 450 people. The choir and organ will be placed behind the pulpit, and there is to be a vestry also. The school is to be built immediately behind the choir, and it will be 45 ft. by 25 ft., and provision is also made for an infants' room, 25 ft. by 15 ft. The building and site are to cost about 3,000*l.* Mr. T. Brown, Stockton, is the contractor, and the architect is Mr. T. W. Richardson, of Stockton.

U.P. CHURCH, GIFFNOCK, N.B.—The erection of Giffnock United Presbyterian Church will be commenced shortly, the site selected being the rising ground on the east side of the Kilmarnock-road. The plan of the church shows a large nave with a small aisle, the entrance being obtained by a porch on the ground floor of the tower. The upper floors are arranged to be available as class or cloak rooms, and a master's study is arranged at the end of the aisle, the addition to the plan, which is shown at the junction of the nave and the side aisle. The choir will be accommodated on a raised platform at the pulpit end of the church. Accommodation is provided by chairs for about 350 persons, and the plan is so arranged that additional space can be

obtained by adding a south transept. The architect is Mr. H. E. Clifford.

WESLEYAN METHODIST MISSION HALL, EDINBURGH.—Building operations will shortly be commenced with the new halls and other premises for the Wesleyan Methodist, Edinburgh Mission. A site of 10,000 sq. ft. has been purchased in the Great Glasgow street and Wellington place, the site being at present occupied by St. John's School and two blocks of comparatively new tenements of shops and dwelling-houses. The street and basement floors have been excavated, and a building of 100 ft. x 20 ft. with a cellarage occupied by the school. The main floor of the hall will be from Wellington place by a corridor leading into a crush-room on an entresol floor. A staircase leads to a large hall on the first floor, and this is planned to accommodate, along with gallery, 1,600 to 2,000 persons. The hall will have a recess for platform and future organ-chamber, with retiring-rooms adjoining. On the first floor there is also arranged a small hall seated to accommodate 100 persons, a platform at one end, and classroom for a lavatory, and a room for the sign of the cross. The whole of the upper floors are arranged for class-rooms, stores, and caretaker's house. The whole scheme has been designed by and will be carried out under the direction of Messrs. Dunn & Co., Limited, of Glasgow. The total cost of the scheme will be over 40,000*l.*

**PRIMITIVE METHODIST CHAPEL, CHURCH GRESLEY.**—The Primitive Methodists of Church Gresley are erecting a chapel in Hastings-road. The plans, by Mr. H. Harper, architect, Nottingham, provide accommodation for two hundred people. Mr. Edwin Clarke, Woodville, secured the contract.

**IMPROVEMENTS AT PADDDINGTON CHAPEL.**—At Paddington Chapel various improvements are contemplated. A new organ is being built by Mr. Gern, of Notting Hill. Another member of the church has promised to present an oak pulpit, harmonising with the oak case of the new organ, and it is proposed to erect a new set of stairs, of about 5,000, some additions and improvements to the buildings, consisting of a new front, with improved staircases and exits, a church parlour, additional vestry and class-rooms, a scheme of decoration, and new windows of coloured glass, also an installation of electric light, and plans and designs for the proposed alterations as well as the new pulpit and organ-case, have been prepared by Mr. Alfred Conder, architect, of Westminster.

**METHODIST FREE CHURCH, BLAYDON.**—On the 14th inst., at Blaydon, Sir James Joicey, M.P., laid the foundation stone of a new church and school for the United Methodist Free Church denomination. Messrs. Bowman & Nicholson, of Newcastle, are the architects. The work will be carried out by Messrs. Davison & Bolam, of Blaydon.

**WINDSOR INDEPENDENT CHURCH, BELFAST.**—The foundation-stone of this building has just been laid. The site is at the corner of Edinburgh-street and Lorne-street. The building is designed to accommodate about 450 people, the length being 74 ft. and the width 58 ft. The material principally used in the walls will be brick, with Dumfries red sandstone dressings, and the style will be Gothic. The architects are Messrs. Fraser & Sons, and the builder Mr. James Kidd.

**WESLEYAN SCHOOLS, BOSTON.**—The new Wesleyan Sunday schools and society rooms at Boston, which have been erected on the site of the old day schools at the rear of the Wesleyan Centenary Chapel, in Red Lion-street, were opened on the fifth inst. The new schools have been erected by Mr. W. Greenfield, of Boston, from plans by Messrs. C. C. Clark and J. C. Greenfield. The building contains sixteen class-rooms—six on the ground floor, and ten on the first floor. The lower class-rooms open on to a large central hall, 50 ft. by 36 ft., and the class-rooms on the first floor open on to a gallery surrounding the central hall. The woodwork is for the most part pine and oak. There are three main entrances, and six doors communicating with the gallery. The building is supplied with gas and hot water. Mr. Greenfield's contract was \$20,000, and the total expenditure is estimated at 2,400.

**GIRLS' HIGH SCHOOL, NEWCASTLE.**—The Council of the Girls' Public Day School Company, Limited, have purchased a site in Eskdale-terrace, Jesmond, from the Corporation, upon which to erect a girls' school. Plans for a new building have been prepared by Messrs. Oliver & Leeson, architects, Newcastle, and the contract has been let to Mr. G. H. Mauchien. The building, as proposed to be built, is a three-story one, the materials to be used being brick and stone. It is approached by a flight of rough steps, and the roofs covered with green tiles. The front elevation is divided into a centre portion and two wings, relief being further gained by projecting ori windows on the first floor, while the main entrance porch is placed in the centre. The main entrance porch is placed in the centre of the main front, and a waiting-room and enquiry-room, with a room for the head mistress and a class-room are reached from it. Immediately to the right of the entrance is a large cloakroom, 30 ft. wide. In the two wings are cloakrooms, lavatories, and conveniences, as well as the staircases, and also class-rooms, each wing having its own entrance for seniors and juniors respectively, while the lavatory entrance is at the north end of the wing. On the first floor are nine class-rooms, and on the second floor are nine class-rooms, accommodating about 220 students, a room for the

assistant mistresses, a broad corridor, and lavatory accommodation, &c. On the second floor there are two class-rooms, accommodating fifty-two pupils, a chemical laboratory, bath-room, scullery, &c. In the mansard over the centre portion of the building are dining-rooms and studios, and also a large kitchen and servants' bedrooms. Altogether the school has class-room accommodation for over 320 pupils. The building will be heated by means of a hot-water apparatus placed in a chamber under the seniors' cloak-room, and, in addition, open ventilating fireplaces are placed in all the rooms. A bicycle shed is provided in the grounds.

**SCHOOLS, QUANTON, BUCKS.**—New schools have just been completed and opened at Quanton. The architects are Messrs. W. F. Taylor & Son, of Aylesbury and Birtton; and the builders, Messrs. Cannon & King, of Quanton. The size of the mixed school is 60 ft. by 21 ft. 6 in.; the infants' school, 22 ft. by 21 ft. 6 in.; the babies' room, 13 ft. by 20 ft.; class-rooms, 18 ft. by 20 ft.; and cloak-rooms, 16 ft. by 9 ft. The infants' room is divided from the main school by a brick wall.

**TECHNICAL SCHOOL, HARROGATE.**—On the 17th inst. the foundation stone of a technical school was laid at Harrogate. The building will be situated at the junction of East Parade and Bower-road. The portion at present being erected contains the following rooms:—On the ground floor is a cool, airy, well-lighted hall, a large room adjoining the hall for building construction, and a connecting passage with the Art Department, a room for advanced modelling, and a large room for life and antique study; two classrooms are also provided on this floor for bookkeeping, dressmaking, and other purposes. On the first floor are lecture-room and painting room, en suite, and head master's room adjoining the hall, a large laboratory, and a lecture-room and lecture room, with balance and stores attached. On the basement are a manual-room and a spare-room, besides the usual provision for heating and other cellars. The entrance is facing Haywa-crescent, and the staircase is in a central position. The corridors and laboratories are finished with glazed bricks, dado height. The other rooms will be finished with dados. The school when eventually completed will contain six or seven additional rooms. The building is being carried out under the superintendence of Mr. W. J. Morley, architect, of Bradford and Harrogate, whose design was selected in competition. The contractors for the building are:—Mr. R. Airtton, Mr. G. H. Ainslie, joiner; Messrs. Fortune & Calverley, plasterers; Mr. G. Thompson, slater (all the above of Harrogate); Mr. G. Moss, painter (Leeds); Mr. F. Holdsworth, painter (Saltaire). Mr. Easton is acting as clerk of works.

OFFICES FOR THE PRUDENTIAL INSURANCE COMPANY, SWANSEA.—The directors of the Prudential Insurance Company have approved of plans prepared by Mr. J. P. Rowlands for the erection of a set of offices on the site of two of the oldest shops in Wind-street. The new premises are to be commenced early in the new year.

**VICTORIA HALL, BOURTON-ON-THE-WATER.**—The Victoria Hall, which is to perpetuate in Bourton-on-the-Water the memory of the Diamond Jubilee of Queen Victoria, was opened recently. It is centrally situated, and is of local stone, with stone-tiled roof, and the architects were Messrs. Prothero & Philott, of Cheltenham. On the ground floor there is a billiard-room 24 ft. by 18 ft., a reading-room 23 ft. by 13 ft., and a committee-room. There are two staircases, one of which leads from the committee-room to the stage in the large room above. The large hall upstairs measures 50 ft. by 24 ft. The builders were Messrs. Alfred Clifford & Son, of Bourton-on-the-Water.

**PROPOSED NEW INFECTIOUS HOSPITAL FOR DEWSBURY DISTRICT.**—The Local Government Board, who were appealed to by Southill Nether Council and by private owners not to sanction the scheme for a new hospital at Mitchell Laithes, within their district, have given sanction to the scheme, which involves an estimated outlay of 1,950*l*. The hospital proper will be of one story, and will, in the several blocks, contain fifty-six beds. The architects are Messrs. Holton & Fox, of Dewsbury.

**CO-OPERATIVE BAKERY AT BEDLINGTON.**—A co-operative bakery was opened at Hollymount, Bedlington, on the 10th inst. The new building, which is of red brick with stone facings, has been erected at a cost of 1,000*l.*, by Mr. R. Baxter, builder, of Blyth, in accordance with plans prepared by Messrs. Boulds & Hardy, architects, Morpeth.

**HOTEL EXTENSION, GULLANE, N.B.**—Additions are being made to the new hotel, Gullane. The hotel, as enlarged, will have over thirty bedrooms, a new dining-room to accommodate sixty persons, also private dining-room, and billiard-room. The additions will cost over 4,000*l*. Messrs. Dunn & Findlay, Edinburgh, are the architects.

**INFIRMARY, NORWICH.**—On the 13th inst. the foundation stone was laid of the Jenny Lind Infirmary, which is a Diamond Jubilee memorial. The new infirmary will consist, when completed, of two wings, radiating at an angle from the centre or administration block, behind which, and beyond the corridor which leads across from ward to ward, are the servants' apartments, kitchen, and other offices. The style is Free Renaissance and the materials are red brick with



stone dressings, the roofs being covered with Broseley tiles. The centre block is of two stories with an attic in the roof. The middle bay, which terminates in a pediment with finials on either side and upon the summit, is enriched with carved panels. The principal entrance is by an arched doorway. On the right of the hall as soon as entered is the board-room, and other rooms on the ground floor are set apart for the use of the nurses, who will have sleeping accommodation on the floor above. Behind the kitchen, which lies across the corridor, are the scullery, larder, &c. On the other side of the passage running through to the back are the stores and the servants' sewing-room, and above are their sleeping apartments. Outside will be the coal and coke store, temporary laundry, &c. Incoming patients will be received in the room behind the board-room, but approach is from a passage entrance alongside the administration block, and not by the main entrance. The east ward—that now in course of erection—will be a large apartment. At the outer end is the day-room for the children, a semicircular apartment. The floor of the ward is raised some three feet or more from the ground level, the walls being carried on arches and girders. At the end of the ward nearest the main corridor is a smaller one, and close by it is the ward kitchen. Very nearly opposite the entrance and across the corridor a passage leads to the operating theatre and the necessary rooms connected therewith, which will stand in the grounds behind the infirmary and out of sight from the road. The isolation ward will be placed at the boundary of the grounds, and will be only of a temporary character at present. The entrance gates and boundary walls are not provided for under the present contract. The main gateway will be opposite to the administration department, and a drive will be formed so as to enable carriages to traverse the grounds and draw up at the steps. The architects for the new infirmary are Messrs. F. Boardman & Son, Mr. Thomas H. Yelf is the contractor.

**BUILDING IN DEVONSHIRE-SQUARE, CITY.**—A block of offices is being erected on the site of No. 15, Devonshire-square. Externally the new building is erected in red brick with Monk's Park stone dressings. The five stories contain suites of rooms, while on the first floor a board-room is provided. A special feature at the rear of the ground floor is the strong-room. The building has been designed by Mr. Howard Chatefield Clarke, of Bishopsgate-street Within, and Messrs. Woodward & Co., of Finsbury, are the contractors.

**ABATTOIR, BRIGHTON.**—At the Royal Pavilion, Brighton, on the 6th inst., Mr. H. P. Boulnois, M.Inst.C.E., held an inquiry into the application of the Brighton Town Council to the Local Government Board for sanction to borrow 3,300*l.* for slaughter-house purposes. The Town Clerk (Mr. F. J. Tillstone) informed the Inspector that there had been three loans in connexion with the undertaking, namely, in April, 1892, one of 7,000*l.* for the main building; in May, 1894, 500*l.* for approach roads to the main slaughter-house, and in May, 1895, 1,150*l.* for private slaughter-house and Superintendent's house, so that the total loans hitherto sanctioned amounted to 8,650*l.* for the slaughter-house and other works in connexion therewith. The actual cost had been 12,046*l.* odd, and the application now was for sanction to borrow 3,300*l.*, being the difference between the amount already sanctioned to be borrowed and the actual outlay on the buildings. The Borough Surveyor (Mr. May) explained in detail the various items which the loan asked for embraced.

**PUBLIC HALL, POLLOKSHAW, N.B.**—Sir John Stirling Maxwell, Bart., M.P., has presented a suite of public halls to the burgh of Pollokshaws. The new hall is built on a site at the corner of Barhead-road and Bengall-street. The principal entrance is from Barhead-road, the door being underneath the clock tower. Immediately on the right there is a vestibule and a corridor, with cloak-rooms and other recesses in front. The large hall, which has a gallery and balconies, accommodates about 800 people; the small hall, which has also a gallery, accommodating about 200 people. There are various ante-rooms, &c., kitchen, and janitor's house. The total cost is between 16,000*l.* and 20,000*l.* The architect is Dr. Rowland Anderson.

**NEW THEATRE ROYAL, SHREWSBURY.**—On the 12th inst. the new Theatre Royal, Shrewsbury, was opened. The interior has been reconstructed, whilst the outside walls have been considerably altered and added to. The principal entrance is approached from the Shoplatch. From this entrance a stone staircase, with decorated ceiling (and walls covered with Japanese paper), leads on to the crush-room, and from this ladies and gentlemen's cloak-rooms are reached, also the refreshment-room. A suite of rooms is also provided for the management. The upper circle is approached by a wide staircase, and in connexion with this ladies and gentlemen's retiring-rooms and cloak-rooms are provided. The pit is a large one. The walls are covered with glazed porcelain tiles and filled in above with a warm-tinted wall-paper, and the ceiling is formed into decorated panels and scrolls. Retiring-rooms are also provided for this part of the house, and a saloon bar has also been constructed. The gallery is approached from the road at the side of the theatre. A stone staircase leads directly to it. Adjoining the stage are the

necessary property-rooms, &c. The stage is separated from the auditorium by a brick wall carried up through the roof, and the opening may be shut off with an asbestos fire-resisting curtain. The exits from all parts are so arranged that the auditorium can be cleared in the space of a very few minutes. All doors are made to open outwards, and are fitted with patent automatic panic bolts. A feature of the building is the canopy which forms a shelter for the early arrivals, and also shields the carriage patrons from inclement weather. The theatre is heated throughout by hot water on the low-pressure system, with American radiators. Hydrants and fire-appliances are provided on each floor. The ventilation of the house has been carried out on the Honeyman system. The decorations of the building are French Renaissance in style. The main ceiling is divided up into twelve panels, all freely treated, the four corners being fitted in with paintings representing musical trophies and dancers. The stage opening is draped by crimson tableaux curtains, and the subject paintings above represent Art, Music, and Comedy. The whole of the work has been carried out under the personal superintendence of the architect, Mr. John P. Briggs, of London. Mr. James Davie has been clerk of works.

The following are the names of the principal firms engaged in the construction and fitting up of the building:—Builder, Mr. Thomas Morris, Shrewsbury; steel constructional work, Messrs. Deane, Ransome, & Co., London; fibrous plaster and artistic decorations, Messrs. F. de Jong, London; dress circle tip-up chairs, Messrs. Shoolbred & Co., London; stalls, pit, and upper circle seating, Messrs. A. R. Dean, Ltd., Birmingham; hot water heating, Messrs. Scull Bros., Shrewsbury; electric light, Messrs. Lea, Son, & Co., Shrewsbury; hydrants, Messrs. Merryweather, London; gas arrangement and fireproof curtain, Messrs. Vaughan & Brown, Ltd., London; ornamental stained glass, Messrs. A. Clark & Co., London; canopy, Messrs. McDowall, Stevens & Co., Glasgow; mosaic floors, Rust's Vitreous Mosaic Company, London; tiling to pit, Porcelain Tile Company, Cobridge; ventilation, Messrs. Crittall & Co., London; stage appliances, Mr. J. I. Lyon, St. Mary Axe, London; sanitary appliances, Messrs. Macfarlane & Co., Glasgow; and the Water Carriage Company, Sheffield.

**CONSERVATIVE CLUB, HIGH WYCOMBE.**—A new Conservative Club in the High-street, High Wycombe, has just been opened. The building has a frontage to High-street of about 28 ft. 6 in. Approaching the building from High-street, access is first gained by a vestibule to a smoking-room. A staircase leads to a reading-room, 30 ft. by 18 ft., and on the first floor there is a committee-room, and a billiard-room for two tables. The second floor is devoted to the steward's apartments. The club buildings have been erected by Mr. G. B. Gibson, from designs prepared by Mr. A. Vernon, of London and High Wycombe.

**DEVELOPMENT OF BARRY.**—Large developments, says the *Western Mail*, are still taking place in the Barry district. Everywhere building is going on rapidly; one of the largest new buildings is the offices of the Barry Dock and Railway Company. Schools, hospitals, hotels, and public offices are either being arranged for or are in course of construction; land has been laid out and houses built in all directions to meet the demand of those having work at the docks and in the neighbourhood. Many business men who have their work in Cardiff reside at Barry, and there is great demand for good-class villa property in the better parts of the town. Some new suburban villas are about to be built on Tynwydd-road, and Messrs. J. P. Jones, Richards, & Budge, of Cardiff, are acting as the agents.

**PRESBYTERIAN HALL, SWALWELL, DURHAM.**—On the 17th inst. the Presbyterian Hall, erected by the Swalwell Presbyterian body, was opened. The new building stands directly opposite the old church in Market-lane. The total cost of the new hall will be nearly 1,200*l.* It has accommodation for 500 people. Messrs. Hadenoch & Bruce, of Newcastle, were the architects, and the contractor was Mr. H. Atkinson, of Blaydon.

**NEW BRANCH OF THE LONDON JOINT STOCK BANK, WOOD-STREET, CITY, E.C.**—The site of the new bank comprises a superficial area of about 3,600 sq. ft., and was formerly occupied by the Church of St. Michael, Wood-street. The bank will occupy about two-thirds of the ground floor and about half of the basement for their own purposes, letting off the upper floors for offices, access to which is provided by a separate entrance and fireproof staircase from Wood-street. The front to Wood-street (which faces down Gresham-street), is a fine specimen of Italian Renaissance in Portland stone, with Swedish red granite dressings to the entrance doorway of the bank. The clock, which was such a conspicuous feature in the old church, has been refixed on the front of the new building. The building throughout is of fire-resisting materials, and will be lighted by electric light. Messrs. Deane's & Emanuel, of Finsbury-circus, were architects for the building. The fitting-up of the bank proper was carried out by Mr. Creese Harrison, of Cannon-street, the bank's architect. The substructure was carried out by Mr. John Greenwood, of Arthur-street West, and the superstructure by the general contractors, Messrs. Ashby & Horner, of Aldgate. Messrs. Dennett & Whitehall, supplied the iron and steel constructional work and the fire-resisting floors. The

patent Paving and Construction Company, of Westminster, executed the concrete staircases. Mr. John Tann, of Newgate-street, supplied the steel strong rooms; Messrs. Archd. Smith & Stevens, the hydraulic lift; Messrs. A. Emanuel & Sons, Limited, carried out the electric light installation; Messrs. De Grelle Houdret supplied the mosaic flooring, and Messrs. Daymond & Son executed the carving to stone front. Luxier prisms are provided to increase the light.

**HOSPITAL, KINGSTON-ON-THAMES.**—The Kingston Victoria Hospital was opened recently by the Duke of Cambridge. On the right of the entrance to the building there is a room for the matron and a store-room; to the left, a room which may be used by convalescents, committee meetings, or as a dining-room. Towards the back of the building there is a corridor, 6 ft. wide running right and left of the main entrance, and terminating at each end in a ward containing four beds. The ward on the left will be used for men, and that on the right for women. From each ward there is a narrow passage capable of being completely closed from communication with the ward and leading to a room fitted up with a bath and other necessary arrangements. Joining the wards is a nurses' room for the use of both night and day attendants. The corners of the wards, both floor and ceiling, are rounded off to facilitate cleaning. The wards are warmed by Shortland's hot-air stoves. Opposite the entrance hall is a doorway leading to a staircase to the upper floor, completely isolating that part of the building, which is devoted to the use of the staff. On the ground floor at the rear is a kitchen and the usual offices. Right and left of the staircase are rooms devoted to dispensing and operating. Major Macaulay, the Borough Surveyor, is the architect.

**OPERATING THEATRE, MILL-ROAD INFIRMARY, LIVERPOOL.**—This addition was opened on the 16th inst. The operating room is situated on the top flat of the infirmary. The theatre has been built by Mr. William Hall, from the designs of Mr. C. H. Lancaster, architect to the union.

**INSTITUTE, CATRINE, AVE.**—The A. M. Brown Institute was opened at Catrine on the 16th inst. The institute, built with Ballochmyle sandstone, from plans by Mr. R. S. Ingram, Kilmarnock, comprises a general reading-room, a ladies' reading room and retiring-room, a ladies' recreation-room, gymnasium and general recreation-room, billiard-room, board and committee room, janitor's house, and baths and lavatories for male and female members. All the rooms are on the ground floor, excepting the board-room, which occupies the second floor of the tower.

**LODGING-HOUSE, LEITH.**—It is proposed to erect a new lodging-house at the corner of Shore and Water's Close, Leith, the warrant for which was granted at last Dean of Guild Court. The lodging-house will have accommodation for 150 beds. The cost of the building will be about 2,500*l.*, and it has been designed by Mr. J. W. Maclean, architect, Edinburgh.

## SANITARY AND ENGINEERING NEWS.

**RESERVOIR, GAINSBOROUGH.**—A new water tower and reservoir, provided at a cost of about 7,000*l.*, have just been opened at Gainsborough. The length of the rising main from the artesian boring to the tower is 2,000 yards, with a total rise of 103 ft. The reservoir has a storage capacity of 1,004,350 gallons. The tower is 75 ft. in height, and the tank will hold about 7,300 gallons of water, sufficient to supply the town for three or four days. The whole of the work has been carried out in accordance with the plans and under the supervision of Mr. Henry Riley, Surveyor and Engineer to the Council. Mr. B. Roberts, of Gainsborough, was the contractor.

**NEW WATER SCHEME, PORTHCAWL.**—Mr. Brough Taylor, C.E., of London, has been engaged by the Urban District Council to prepare plans, specifications, &c., for the new water supply for Porthcawl.

**SEWAGE DISPOSAL, TAUNTON.**—Colonel A. G. Durnford, R.E., held an inquiry on behalf of the Local Government Board at Taunton, recently, into the application by the Town Council for powers to borrow 18,250*l.* for purposes of sewage disposal. The Town Clerk (Mr. J. H. Kite) pointed out that 7,000*l.* of the money required was to be applied to the purchase of Landbrook Farm for irrigation purposes, and the remaining 11,250*l.* would be applied to the carrying out of works for, and adopting the existing sewage works to, the septic tank system in accordance with the scheme drawn up by Mr. A. J. Martin, of Exeter (Messrs. Cameron, Gull, & Martin). The usual formal evidence was given and the inspector subsequently visited the works.

## FOREIGN.

**FRANCE.**—The Académie des Beaux-Arts on Saturday elected M. Cormon as a member in place of the late M. Lenoire. The new Academician is fifty-three years of age. He was a pupil of Portalis, Fromentin, and Cabanel. He has been an exhibitor since 1868, and obtained the Prix de Salon in 1875, the Medal of Honour in 1887, and the Grand Prix at the Universal Exhibition in 1889. He is also "Officier" in the Legion of Honour. Among his most important works may be mentioned "Les Niebelun



gen" (Lisieux Museum), the "Mort de Ravana" (Toulouse Museum), "Cain" (in the Luxembourg), the "Vainqueurs de Salamine" (Rouen Museum), the "Bataille de Gravelles," "Les Funérailles d'un Chef," "Une Forge" (in the Luxembourg), and lastly the large scheme of decoration for new Natural History Museum.—M. Deffrassé has been appointed official architect to the Bank of France, in place of the late M. Crétin; and his place as Inspector of Works at the large palace at the Champs Elysées has been taken by M. Olivier. —M. Brebant has been instructed to prepare the plans for the new Institute of Biology which is to be built next to the Pasteur Institute. —M. Henri Cros, the sculptor, has completed the model which he has made of the monument to Corot. The monument, which is to be executed in "Pâte de Verre," will consist of a stele with a bas-relief of two nymphs symbolising "Le Poème Pastoral," and at the sides two figures representing Morning and Evening. At the top is a medallion of Corot, at the base his palette.—The Town Council of Lyons have decided to give the name of Pavis de Chavannes to the present "Place des Hospices," one of the finest streets in Lyons. A new Prefecture Hotel and Tribunal of Criminal Commerce are to be built at Lorient.—M. Roll, the painter, has completed a large picture intended for the Versailles Museum, representing the laying of the first stone of the Alexandre III. bridge.—M. Gervex is preparing for the 1900 exhibition an immense picture of the coronation of Nicholas II. in the Church of the Assumption at Moscow, which will be exhibited in the Russian section.—A large infirmary for the aged was opened on Sunday at Montrouge.—The jury of the competition opened by the Corporation of Pontoise for the construction of a savings bank has selected for execution the design by M. Guilbault, of Paris; the second premium has been awarded to M. Beaudouin, of Pontoise, and the third to M. Charpentier, of Gagny.—The death is announced, at the age of 72, of M. Louis Ernest Lheureux, Honorary Architect to the City of Paris. He was a pupil of Labrousse, and obtained medals of the first class in 1873 and 1878. He was architect of some important works, among the principal of which were the library of the Ecole de Droit, the new warehouses at Bercy, and the new buildings of the Faculté de Droit, recently inaugurated.

### MISCELLANEOUS.

**PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.**—The business of Mr. Henry Hope, heating and ventilating engineer, Birmingham (established in 1818) has been converted into a limited company under the title of "Henry Hope & Sons, Limited." It will be carried on at the same address, 55, Lionel-street, Birmingham.—Arrangements have been made by the practice of the late Mr. J. Gibbons Sankey, of Manchester, has been assigned to and will be carried on by Mr. Thomas W. Cubbon and his brother, Mr. J. Cubbon, who was for some years Mr. Sankey's principal assistant.

**EDINBURGH AND LEITH MASTER BUILDERS ASSOCIATION.**—The annual dinner of the Edinburgh and Leith Master Builders' Association was held in the Royal British Hotel, Edinburgh, on the 8th inst. and was attended by over 120 gentlemen. Mr. John Lowie occupied the chair, and in welcoming the delegates who were present from Glasgow, Perth, Dundee, and Aberdeen, said the building trade all over the country was in an exceptionally good condition. The toast of "The Queen and the Royal Family" having been honoured, the Chairman proposed "The Magistrates and Council of Edinburgh and Leith." Councillor Douglas and Councillor Fisher, Leith, acknowledged the toast. Mr. Rex submitted the toast of "The Edinburgh and Leith Master Builders' Association." Mr. William Forrest, replying, said their Association was started about eighteen or nineteen years ago, with a membership of something like sixty, composed wholly of masons. They had now a membership of over 170, and they had amalgamated with them joiners and plumbers, and he hoped they would press forward towards having all connected with the building trades united into one. "The Representatives and Members of Kindred Associations" was proposed by Mr. Drysdale, and replied to by Mr. Forbes, Mr. McEwan, and Bailie Selkirk, Glasgow; ex-Bailie McLeish, Perth; Mr. James Worling, Aberdeen; and Mr. James Blair, Dundee. Mr. Drysdale proposed "The Architects and Surveyors," which was acknowledged by Mr. Hunter Crawford, who referred to the loss the profession had recently sustained in the death of Mr. Hamilton Beattie; and by Mr. Cairns and Mr. Lawrence. "Our Merchants and Contractors" was proposed by Mr. Elliot, and responded to by Councillor Graham Yool, Leith. Other toasts followed.

**EXCAVATIONS AT WAVERLEY ABBEY.**—The council of the Surrey Archaeological Society have issued a statement showing the work that has been already done in regard to the excavations at Waverley Abbey. The first points of interest disclosed included the west end of the chapter-house and the remains of its beautiful doorway. It was then decided to continue the excavations, and Mr. William Anderson set about clearing the chapter-house and the slype or covered way adjoining, to the original level. Since then the ground south of

the cloister, and lying between the cellarium and monks' dormitory, has been explored, with the result that now may be seen the kitchen block, wholly uncovered; the walls of the monks' refectory, with the stone arch running along three sides; portions of the walls of the caldactory, or warming-room, and of some other rooms. The church, too, has been partially excavated, and, amongst other things, the divisions of the chapels in the transepts brought to light. East of the chapter-house and monks' dormitory, according to the normal cloister plan, should be the infirmary with its hall, chapel (said to have been larger than that at Trinity College, Oxford), and kitchen offices, the abbot's house, the prisons, &c. In the cloister, opposite the chapter-house door, the coffin was found of William Mauduit, the third Baron of Hanslope, and King's Chamberlain, whose burial took place the October, 1194, as recorded in the annals of Waverley. North of this was one other interment, and to the south of it four more, that at the end having above it a plain stone slab without inscription. The importance of this discovery lies in the fact that the coffins were not of stone, as is usual in our abbey, but of oak, almost as sound as on the day they were deposited here. Photographs and careful measurements having been taken, the earth was replaced. During the excavations many objects of interest have been brought to light, including window glass, some of it painted, with portions of the lead casements in which it was fixed; a large number of floor tiles, many having designs of various kinds; a great store of fragments of medicinal pottery, some of considerable interest, and of glass vessels and other objects illustrative of the domestic life of a monastery.

**BRISTOL CLERKS OF WORKS AND BUILDERS' FOREMEN'S ASSOCIATION.**—The sixth annual dinner of the Bristol Clerks of Works and Builders' Foremen's Association was held on the 15th inst. at the Grand Hotel, Broad-street, Mr. F. Wills presided. The loyal and patriotic toasts having been honoured, Mr. J. N. Pike submitted "The Architects," and Mr. H. Dare Bryan and Mr. James Hart responded. Mr. J. Bale proposed the "Builders." Mr. A. Krauss, President of the Bristol Master Builders' Association, acknowledged the toast, remarking that a great deal of their success depended upon their foremen. The previous speeches showed there was a very good feeling existing between the professions represented there. Mr. F. N. Cowlin (Vice-President of the Bristol Master Builders' Association) said that the recent trouble in the building trade had made things very awkward for the foremen. Besides knowing the trade to which he was apprenticed, a builder's foreman needed many qualifications. Builders wished the Association every success. The Chairman gave "The Association of Clerks of Works and Builders' Foremen." He believed that the general public were of the opinion that architects, builders, clerks of works, and builders' foremen were at war, but this was quite erroneous, and he could see no reason for any clashing of interests. There was a question that affected architects, builders, clerks of works, and foremen, and that was whether work concerning them was being carried out in the most judicious, economical, and businesslike manner. He wished all success to their Association. Mr. W. Kidwell (President) said the progress made by the Association had been very satisfactory during the past year. A number of very instructive papers had been read at the meetings, and the value of those papers had been great. Mr. R. Hillier (Secretary), also replied. Other toasts followed.

**THE LONDON SCHOOL BOARD AND RATES OF WAGES.**—At the meeting of the School Board for London on the 15th inst., at the offices on the Victoria Embankment, there was some discussion on the question of the rate of wages. The matter has been several times debated. Since the last occasion the Works Committee has been reconsidering the question. The Rev. Copeland Bowie, on behalf of that Committee, moved that the wages clause in building contracts be amended so as to read as follows: "Where the London scale of wages shall apply the contractor shall pay to the workmen employed by him not less than the rates of wages from time to time mutually agreed upon by the Central Association of Master Builders of London and the representatives of the unions of the various branches of the building trade, the agreed rates of wages at present recognised being set out in the schedule hereto; or, in the case of any other trade, not less than such rates of wages as may be recognised by the Board and specified in the schedule." For in all other districts where the London scale of wages shall not apply the contractor shall pay the workmen and all persons employed by him in connexion with his contract, not less than the minimum standard rate of wages which may for the time being be agreed upon by the Board, and every breach by the contractor of this condition, and notwithstanding the condonation of any prior or other breach, the contractor shall, on demand, pay to the board, as liquidated damages and not as a penalty, the sum of 5*l.* Mr. Macnamara, as an amendment, proposed the omission of the words near the end of the clause, "which may for the time being be usual and generally paid where such workmen are employed," and that there should be inserted instead "accepted between employer and

employed." Father Brown seconded the amendment, which was carried by 17 to 14 votes. Father Brown moved a further amendment, adding words to the effect that in any case where there is no recognised standard rate of wages, the contractor shall deposit on the tender the rates which he proposes to pay for the work to be carried out under the contract. Mr. Macnamara seconded the amendment, which was carried by 23 to 21 votes. A proposal was then made to refer the whole question back to the Works Committee, but this was rejected by 23 to 21 votes. The original motion as amended was then adopted.

**CRYSTAL PALACE COMPANY'S SCHOOL OF PRACTICAL ENGINEERING.**—On the 16th inst. the certificates awarded by the examiners of the Crystal Palace Company's School of Practical Engineering were distributed in the lecture theatre of the school. Sir C. Rivers Wilson presided. The examiner's report stated that the number of students who attended the lectures in the first year's course was forty-nine, eligible for examination forty-seven, passed twenty-nine. The work of the students in the mechanical section was stated to be highly satisfactory. The students had been carefully trained, and a large percentage of those attending had gained a good practical knowledge of materials and their manufacture. The other sections of the school were highly spoken of by the examiners. The report of the examiners as to the electrical section stated that many of the students showed a keen appreciation of the commercial side of the engineering problems. The Chairman, before distributing the certificates, said that the examiners and persons of his generation suffered from not having the opportunities presented to them in their day that were so freely given now were more than ever being borne in upon his mind. The certificates were then distributed, and some other speeches followed.

**CARDIFF MASTER BUILDERS' ASSOCIATION.**—The annual dinner in connexion with the Cardiff Master Builders' Association was held at the Royal Hotel on the 15th inst. The President (Mr. J. E. Turner) occupied the chair. In the course of the evening Mr. W. Symonds proposed "The Health of Architects and Surveyors," and Mr. C. B. Fowler, the President of the South Wales and Monmouthshire Architects' Society, in reply, spoke of the friendly feeling which existed between contractors and architects. The toast was also acknowledged by Mr. Charles Taylor, Mr. David Morgan (Messrs. James & Morgan, architects) proposed the toast of the evening, "The Cardiff Master Builders' Association," and congratulated the President upon the fact that he had been re-elected for a second year, and Mr. H. E. Lattey upon being elected vice-president. The Chairman first replied. He wanted inserted in every bill of quantities a clause which would call the attention of the builder to the fact that there was a Workmen's Compensation Act, an Employers' Liability Act, and also an action at common law which every builder was entitled to. What he wanted was that justice should be done to every department of the trade. They also wanted a definite form of contract agreement; an arbitration clause, for one thing, should be inserted. Mr. J. Morgan submitted "The Visitors," Mr. W. T. Morgan responded. The Visitors' Club, with the name of Mr. Alfie Thomas, M.P., Mr. Thomas responded.

**GLASGOW ARCHITECTURAL CRAFTSMEN SOCIETY.**—The usual meeting of this Society was held on Friday, December 17, when papers were read by Mr. John B. Wynn and Mr. William H. Baxter. Mr. Bowman took for his subject "Difficulties with Foundations." He prefaced his remarks by explaining that the points he would touch on had come under his own observation in a building where he was engaged as Inspector of Works. The difficulties in the site were numerous owing to part of it being at one time used as a quarry. He explained the methods he adopted in overcoming them. Underpinning—which had to be done to some of the adjoining buildings and hollow walls—was also touched on. The lecturer made good use of the blackboard in drawing details of the site, foundations, &c., and the methods he resorted to in overcoming his difficulties. Mr. Baxter then read his paper on "Shoring and Slapping," and in introducing his subject the lecturer emphasised the fact that many tradesmen did not know anything of the difficult and risky operation of shoring and slapping old buildings. He said that it was quite a tempting of Providence the way in which a number of alterations were carried out. He then went into the subject very fully and explained how shoring and raking shoring as carried out in Glasgow. Raking shoring was not much used here owing to stone being so much employed instead of brick. In slapping, the position of the new beams and columns should be taken into account. Supports should be under the ribs of the openings above chimney breasts should be supported, and all windows should be braced. He mentioned that he had no faith in cast-iron needles, as they were not so reliable as steel beams. Needles should not be wedged and driven tight more than was necessary, as the additional stress was apt to shake the building. A number of diagrams were on exhibition illustrating this paper.

**GROSVENOR CHAPEL, MAYFAIR.**—Application will be made to Parliament in the ensuing Session for



leave to bring in a Bill whereby it is proposed to abolish the perpetual curacy of the chapel, in South Audley-street, to enable the Rector of St. George, Hanover-square, parish, to serve the chapel as a chapel-of-ease to the parish church, and to vest the chapel and its site (now vested in the parish Vestry) in the Rector as incumbent. The chapel was built in 1730; in the vault were buried Lady Mary Wortley Montagu, Lord Chesterfield, Ambrose Phillips, John Wilkes, and, according to a statement in *Notes and Queries* of July, 1894, Colley Cibber. It seems, though, that Cibber was laid with his parents, in the vaults beneath the (old) Danish Church in Welleclose-square.

**THE POLYTECHNIC, REGENT-STREET.**—Medals, prizes, and certificates were presented to the successful students of the architectural, electrical and mechanical engineering, and mathematical classes at this institution on the 14th inst., by Mr. E. Bond, M.P., L.C.C. (chairman of the Technical Education Board). Mr. R. Mitchell, director of education, congratulated the students on the success which had attended these sections of work. The fact that the attendance in the architectural classes had increased in the year from 500 to 650 and that in engineering there had been an increase of 30 per cent., showed that the instruction given met the requirements of the artisan class. In the other classes there were similar increases, and the capacity of the building was severely tested to accommodate 3,000 or 4,000 students attending various classes nightly. Awards were distributed among nearly 600 students. Mr. Bond said, as chairman of the Technical Education Board, he knew how excellent was the work of the Polytechnic, how deserving it was of every assistance the Board could afford, and while the work was carried on with the efficiency hitherto displayed that assistance would not be wanting. Dr. Garnett, secretary of the Technical Education Board, commended the architectural and similar classes as well calculated to meet the difficulty London lads found in obtaining training in the building trades.

**GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.**—The Scotch Education Department have awarded four Queen's prizes, value 21 each, to students of the Architectural Department of this College; namely, one in architectural design to James M. Alexander; one in architecture to John M. Arthur; and two in building construction, one to James A. Ferguson and the other to Robert Park. These prizes are awarded to those students who do best in the May examinations, and they are competed for by students in all parts of the United Kingdom. A series of most instructive visits have just been paid on Saturday afternoons by the students of this department. The structures visited in course of erection were:—Ruchill Hospital, Pollokshaws Town Hall, and Glasgow Bridge. One afternoon was spent at the Sewage Purification Works; another at the Cathedral, when Professor Gourlay conducted a special architecture class visit for the study of the vaulting; while on a third the Honours Stage Students joined the Craftsmen's Society on a visit to the weir at present being constructed on the Clyde.

**"LINO LATTICE" SOUND PROOFING.**—The "Lino Lattice" flooring (Thomas's patent) is a system of special pugging and a special non-conducting joint strip for rendering floors sound-proof in a sanitary manner. The pugging is put on in large flat bags filled with a mixture of two-thirds granulated cork and one-third sawdust. This is treated with sulphate of iron and sulphate of copper, to render it vermin-proof. The bags are laid on a simple lattice between the joists, and a strip of the lino-lattice material, a species of felt but of tougher material (and a non-conductor of sound) is laid along the top of the joists, and the flooring boards go over this. The pugging is stated to be half the cost of slag wool, and also about half the weight. It is supplied by the Lino Lattice Company, of Bristol, of which Mr. F. Gey is the manager.

**DUFFEY'S DOWELLED WOOD PAVING.**—This pavement, some of which has just been laid for the Great Central Railway Company, in front of their terminus in Marylebone, is an application to street paving of the Acme wood block flooring method. The paving blocks are only 3 in. thick, but are connected by hard wood dowels, so that a large portion of the paving becomes practically like one block, the blocks affording support to each other. It is claimed that they can be laid without concrete and without expert labour (that we rather doubt), and that tilting, lifting, or dislocation of the blocks is rendered impossible, as it obviously must be. The perfectly level surface obtained is no doubt easier for traffic than that of a wood pavement of which each block is separate, but we do not altogether see why there should be so much less rapid wear in the blocks themselves, or why 3 in. blocks should have the life of a 6 in. one laid by the ordinary method, though it would no doubt have a longer life than a 3 in. block laid on the ordinary method. It is at all events a very smooth, compact, and workmanlike form of street pavement.

**PATENT INTERLOCKING GIRDERS.**—We have before us a description of a new wooden model of a new method of connecting rolled iron girders, patented by Mr. R. C. F. Wyatt and Mr. T. H. Wyatt. The patent consists in having the beams rolled with a raised fillet on the upper side of the lower flanges, about half-way between the web and the outer edge of the flange. Any cross beams

which are to rest upon the larger beams have a niche cut crosswise in the lower flange, at each end of the length of the beam, so as to correspond with and slip over the projecting fillet on the flange of the main beam. Thus the beams are securely tied together without rivetting, or without the necessity of depending on rivetting for the tie. Such beams would require more trouble in fitting together than by ordinary rivetting, but the connexion would no doubt be a very strong one, and the extra cost of manufacture and putting together would be partly compensated for by the absence or reduction of rivetting work.

**FONT, PARISH CHURCH, LAMBETH.**—On the 18th inst., a font grave for baptising adults by immersion was dedicated as a memorial to Archbishop Benson in the parish church of Lambeth. The new font is in the baptistry immediately behind the one in ordinary use, and is designed after the general plan of one in the ruined church of St. Stephen in the Campagna at Rome. It consists of two concentric semi-circles with steps down on each side. The material used is Pavanezzo marble, with a kerbing of Langueudo marble. On an iron rail between the old and new font is an inscription in open copper work, taken from the font at St. Sophia at Constantinople. The work has been executed by Messrs. Farmer & Brindley from designs prepared by Mr. J. Arthur Reeve, of Westminster.—*Times*.

**SCOTTISH SOCIETY OF ART WORKERS.**—The first general meeting of this Society was held on the 14th inst. in the rooms of the Glasgow Institute of Architects, Pitt-street, Glasgow. Mr. James A. Morris, President, in the chair. The minutes of previous meetings held in connexion with the formation of the Society, together with the report of the council and treasurer's statement, were read and approved, and the office-bearers and council who had acted hitherto were continued in office for the coming session. The President is Mr. James A. Morris, Ayr; and the Vice-President is Mr. R. S. Lorimer, Edinburgh. The President said the lack of such a society had long been felt, and the representative nature of the membership, he felt assured, gave good promise of future activity and usefulness. He indicated the advantages which the society was likely to confer on art work and workers in Scotland in bringing together craftsmen, hitherto pursuing their work in isolation, for mutual study and encouragement, and by the introduction of crafts till now little practised north of the Border. Of these he instanced, among others, mosaic, enamels, lacquer, wood engraving, bookbinding, and lead and pewter work, and suggested the possibility in connexion with such of arranging for demonstrations by recognised masters of these crafts. Various suggestions were made by the members present, and the feeling was generally expressed that, while the holding of public exhibitions of art work was one of the objects of the Society, it would be better to delay proceeding in this direction meantime, and it was finally decided to have, and remit to the council to arrange for, a first social meeting and private exhibition of work at an early date in Glasgow, and thereafter meetings and demonstrations of art work in Edinburgh and other centres.

**READING MASTER BUILDERS' ASSOCIATION.**—A meeting of the master builders of Reading and the neighbourhood was held at the Queen's Hall, Reading, on the 8th inst. Mr. James Catley presided, and the attendance numbered over 100. The meeting was addressed by Mr. Thomas F. Rider, ex-President of the London Master Builders' Association. Mr. E. B. Badcock moved:—"That it is desirable to form a Master Builders' Association, with the object of promoting and protecting the interests of the building trades of the district, and that this meeting hereby pledges itself to protect such an association." The motion was seconded by Mr. Musselwhite (Basingstoke) and carried unanimously. Subsequently a committee of twelve members was appointed to draft rules for the association.

## CAPITAL AND LABOUR.

**IRONWORKERS' LABOURERS, ABERDEEN.**—There has been a strike for a few weeks in this department, but the shipbuilders having taken the lead and given an advance of one shilling per week of wages the dispute is now over.

## LEGAL.

### BREACH OF BUILDING BY-LAWS, COVENTRY.

ON the 10th inst., at Coventry City Police-court, Thomas Broughton, of Clarendon-street, Earlsdon, was summoned at the instance of the City Engineer (Mr. J. E. Swindlehurst) for an offence against the Corporation's building by-laws. The Town Clerk (Mr. L. Beard) told the magistrates that the by-law was one of importance, but it had to a considerable extent been disregarded for some time. It provided that each individual who erected a building should, upon the completion thereof, send a written notice of such completion to the Engineer, and give him an opportunity of inspecting the building. The defendant remedied the defects as soon as the legal requirements were pointed out

to him. This was the first case taken under the by-law, and Mr. Beard did not press for a heavy penalty. A fine of 5s. and costs was inflicted.

### A WORKMAN'S CLAIM FOR COMPENSATION.

AT the Liverpool County Court, on the 12th inst., before His Honour Judge Shand and a jury, Charles Thomas Moore, a joiner, living in Liverpool, brought an action under the Employers' Liability Act against William Tomkinson & Sons, contractors and builders, to recover 150l. for personal injuries sustained by him while in the defendants' employ in April last. Mr. Tobin (instructed by Mr. H. F. Neale) appeared for the plaintiff, and Mr. Collingwood Hope (instructed by Messrs. Tyrer, Kenion, & Co.) for the defendants.—The plaintiff's case was that on April 20 last he was employed as a joiner by the defendants, who were erecting a refrigerating-room in a building in Derby-road, Bootle. The beams to support the first floor were being put up, when, owing, he alleged, to the absence of a prop under two of the beams, a ladder on which he was working fell, and he received serious injuries. His collarbone was broken, and his right arm, shoulder, and wrist were injured so that he had not since been able to do any work. His wages had been 95d. an hour. For the defence, it was contended that there had been no negligence on the part of the contractors or their superintendent; that the work was being done in the customary way, and that the accident arose by reason of the carelessness of the plaintiff and his mate, inasmuch as the chain sling was removed before the beam on which the ladder rested had been secured. The jury returned a verdict for the plaintiff, and awarded him 125l. His honour accordingly gave judgment for that amount.

### ALLEGED INJURY TO WALLS BY CONTRACTORS.

THE case of Slaughter v. Abrahams came before Mr. Justice Kekewich, in the Chancery Division, on the 16th inst., on a motion by the plaintiff to restrain the defendant from altering certain external walls of a building. The case for the defendant was that as he had put the alterations into the hands of his contractors the contractors were liable if anybody was injured.

In the result it was arranged that the plaintiff should amend his notice of motion by adding the contractors as parties.

### STEPNEY ANCIENT LIGHTS DISPUTE: CASE IN THE CHANCERY DIVISION.

THE case of Mardell v. Davies Brothers came before Mr. Justice Romer, in the Chancery Division, on the 16th inst. on a motion by the plaintiff for an interim injunction restraining the defendants until the trial from the alleged interference with his ancient lights at Newark-street, Stepney.

Mr. Ralph Neville, Q.C., for the defendants, said he had only got the affidavits of the other side the previous night, and wanted time to answer them.

Mr. Levett, Q.C., for the plaintiff, wished to state that when the defendants got the notice of motion and the original affidavits they had already built 6 ft. higher than the other building and then they rushed up the building another 10 ft. and were now putting the roof on. He (counsel) should ask his lordship to leave to amend his notice of motion by asking for a mandatory injunction compelling the defendants to pull down what they had built up.

Mr. Neville: I only want to save time. We will give the plaintiff an undertaking in the meantime not to proceed further with the front of the building. Of course, if we are ordered to pull down we must pull down.

After some argument Mr. Levett said he would accept an undertaking that the defendants would not build further so as to interfere with the plaintiff's ancient lights.

This was agreed to, and the motion stood over (till the second motion day next sittings) on the defendants' undertaking, the plaintiff having leave to amend his notice of motion by asking for a mandatory injunction.

Order accordingly.

### IMPORTANT ACTION AGAINST A BUILDER.

THE hearing of the case of Finch v. Woodrow was concluded in the Court of Appeal on the 17th inst., on an appeal by the plaintiff from the judgment of Mr. Justice Wills at the trial by a common jury in the Queen's Bench Division. It appeared that the plaintiff was a licensed victualler carrying on business at the "Magpie and Punch Bowl," Bishopsgate-street Within, and in October, 1896, the defendant, a builder, agreed verbally to execute certain alterations at that house for the plaintiff, including the laying of a new patent fireproof flooring between the flooring of the first floor and the ceiling of the refreshment bar on the ground floor. The defendant agreed to execute the work so as not to interfere with the business in the bar, which was to be carried on as usual. While three customers were having refreshments



[illegible]



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Laying-out Cemetery .....	Kautsford U.D.C. ....	20' and 10' .....	Feb. 28

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Additions to Schools, Keston-st. ....	Private Methodist Trustees .....	J. Wills, Archt. Victoria-bank, Derby .....	Dec. 29
Additions to G. Garrison-st. Bridging-tow Quay .....	do .....	J. Barnard, Archt. Bridging-tow Quay .....	do
Business Premises, Prince-street, Bridlington (Lanc) .....	L. Noblett .....	S. Dyer, Archt. Bridlington Quay .....	do
Twelve Houses, Dillington-road, Barnsley .....	Taylor's Drug Co. ....	W. A. Turner, Archt. 10, Pitt-st. Barnsley .....	do
Severance Works, Houghside .....	Pulsey (Yorks.) U.D.C. ....	J. Jones, Surv. Council House, Pulsey .....	do
Street Works, Edward-st. &c. ....	Withington (Lancs.) U.D.C. ....	A. H. Mountain, C.E. Town Hall .....	do
Pipe Laying, &c. near Wakenfield .....	Knley U.D.C. ....	P. Shaw, C.E. Union-st. Dewsbury .....	do
Sewers, Vale-road .....	Tunbridge Wells Corp. ....	W. C. Gupta, Town Hall .....	do
Tar Paving, &c. ....	Leamington T.C. ....	W. de Wintonville, Esq. Town Hall .....	do
* Widening Road .....	Bromley U.D.C. ....	Surveyor, Council Offices .....	do
* Diversion of Outfall and other Works Water Tower, &c. ....	do .....	do .....	do
Brewery, &c. Sugar-st. Nelson, Lancs .....	Lutterworth Freshhold Land Soc. Ltd. ....	W. M. Cowdell, Archt. 12, Grey Friars, Leicester .....	Dec. 30
Road Making, &c. Bally-lane .....	W. Astley .....	T. Bell, Archt. Market-st. Nelson .....	do
Kingdon House, &c. Deaton, Sussex .....	Durham Corp. ....	G. Gregory, Dist. Surv. Western Hill, Durham .....	do
Road Materials .....	Water Co. ....	F. A. Courtney, Archt. 10, Bolham, S.W. Westchester, S.W. .....	do
Schools, Harnmouth .....	Buxton C.C. ....	W. H. Parker, County Surv. 1, Bedford-st. Harnmouth .....	Dec. 31
Rebuilding 3 Cottages, Lawn-road, Ayr .....	Governors .....	J. E. Evans, Archt. Falkenstein, S.W. .....	do
* York Stone .....	Barkway & Hitchcock Falkenstein Corp. ....	W. W. Wabber, 55, Davies-st. Bolham, S.W. .....	do
* School Buildings .....	Merton County Schools .....	J. E. Evans, Archt. Harnmouth .....	do
Sewers, Railway-street .....	Taunton T.C. ....	J. H. Smith, C.E. Municipal Offices .....	Jan. 1
Villa, Redhaven-st. Elgin .....	do .....	A. & W. Reid & Witter, Archt. Elgin .....	Jan. 2
Alterations to Schools, Fountain-st. ....	Morley Sch. Bd. ....	Buttery & Birds, Archt. Town Hall .....	do
Tar Paving .....	New Malden U.D.C. ....	T. V. H. Davidson, C.E. New Malden .....	do
Reservoir, &c. ....	Milford Ireland Union .....	J. Wilkinson, Surveyor, Milroy Broadway .....	do
Making-up Malcolm-road .....	Wimborne U.D.C. ....	Surveyor .....	do
Water Supply Works, Barkip .....	Ayrshire C.C. ....	P. C. Hart, C.E. 22, John Finslie-st. Kilmarnock .....	do
Road Works, Putney-road .....	Handwerth (Staffs.) U.D.C. ....	E. Knowlton, C. Council House, Handwerth .....	Jan. 3
* Iron and Stoneware Pipe Sewers .....	Epping U.D.C. ....	Urban Smith, 41, Parliament-st. S.W. .....	do
* Gurnsey Granite Spalls .....	West Ham Union .....	The Clerk, Offices, Union-st. Gurnsey, E. .....	do
Road Works, &c. Suffolk-street .....	Hove, Sussex T.C. ....	H. H. Scott, Boro Surv. Town Hall .....	Jan. 4
Additions to Schools, Yavayan .....	Yatradylodwg Sch. Bd .....	J. R. Jones, Archt. Hillside Cottage, Penryn .....	Jan. 5
* Carting Away Slop and Sweepings .....	St. Marylebone Vestry .....	The Vestry Clerk, Court House, St. Marylebone, W. .....	do
* Watering Streets and Roads .....	do .....	do .....	do
* Removal of House Refuse, &c. ....	do .....	do .....	do

## CONTRACTS—Continued.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by.	Tenders to be delivered.
Road Works .....	Wansstead (Essex) U.D.C. ....	Surveyor, Council Offices, Wansstead .....	Jan. 6
* Extension of Institute Buildings, Derby .....	Midland Ry. Co. ....	House, Derby .....	do
* School .....	Ollingham and Orange Sch. Bd. ....	High-st. New Brompton A. L. Lang, Surv. 12, Fidler-st. Macclesfield .....	Jan. 7
Arcade, Sandyland, Heysham .....	C. Lee .....	S. Mather, C.E. Victoria-road, Salford .....	do
Making-up Gladstone and other road .....	Sherston U.D.C. ....	J. Angell, Council Offices, Beckenham .....	Jan. 9
* Paving Works .....	Beckenham U.D.C. ....	do .....	do
* Making-up Road .....	do .....	do .....	do
* Precipitating Tanks, &c. ....	Southampton Corp. ....	W. B. G. Bennett, Town Hall .....	do
* Infirmary, &c. at Workhouse .....	Horsbam Union .....	C. H. Bartlow, Archt. 6, West-st. Horsbam .....	do
Drainage and Street Works .....	Wolverhampton Corp. ....	W. Bradley, C.E. Town Hall .....	do
Filter Beds, Penbury .....	Tunbridge Wells Corp. ....	Hall .....	do
* Two New Wards, &c. at Asylum .....	Derby County Asylum .....	J. S. Storey, County Offices, Derby .....	do
Fire Station, High-street, Merthyr .....	Barrow U.D.C. ....	G. B. Jones, C.E. High-st. Merthyr .....	Jan. 10
* Greenhouses at Cemetery .....	Ilkington Vestry .....	Superintendent, Cemetery, East Fitchley .....	Jan. 11
Fire Station .....	Kidderminster T.C. ....	Town Hall .....	do
Schools, Mile Thorne .....	Halifax Sch. Bd. ....	J. F. Walsh, Archt. Halifax .....	do
Baths .....	Selby (Yorks.) U.D.C. ....	W. Hasnack & Son, Archt. Brough, Selby .....	do
* School .....	East Barnet Sch. Bd. ....	W. Pywell, 40, St. James-st. Barnet .....	Jan. 12
Two Villas, Bangor-rd. Forres, N.B. ....	Building Co. Ltd. ....	J. Forrest, Archt. High-st. Forres .....	Jan. 14
* Drainage Works .....	N. Wales Counties Lunatic Asylum .....	J. T. Wood, Cook-street, Liverpool .....	do
* Reservoir, Newmill, N.B. ....	Bermundsey Vestry .....	Spence & S. E. ....	Jan. 16
* School Buildings and Appurtenances .....	Cent. London Sch. Bd. ....	G. H. Hart, C.E. 35, John Finslie-st. Kilmarnock .....	Jan. 20
* Main Drainage .....	Chipping Norton T.C. ....	Newman & Jacques, 2, Fenwick-st. Chipping Norton .....	Jan. 21
* Works (various) in connection with Tramways .....	Hull Corp. ....	Borough Surveyor, Chipping Norton .....	Jan. 31
* Alterations to Drainage at Schools .....	City Engineer .....	See advert .....	do
* Offices, Huddersfield .....	St. Paul's Guardians .....	U. Ayres, 11, High-st. Watford .....	No date
* House, Hetherington, Limerick .....	Prudential Assurance Co. Ltd. ....	A. Waterhouse & Son, 20, New Cavendish, W. .....	do
Eight Houses, Carlisle .....	J. Ryan, 100, George-st. Limerick .....	J. Ryan, 100, George-st. Limerick .....	do
Additions to Business Premises, Recent at Wrexham .....	W. Aston .....	W. Aston .....	do
Road Works, Elgin .....	W. Aston .....	W. Aston .....	do
Drainage Works, &c. Winchester .....	Albion Barton Bldg. Estate .....	H. J. Weston, C.E. 54, Fawcett-st. Southampton .....	do
Sewers, Eleanor-street .....	Grimsby Corp. ....	M. Peters, C.E. Town Hall .....	do
Setts (1,000 tons) .....	Manchester Corp. ....	Borough Surveyor, Town Hall .....	do

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
* Engineer to Assist Surveyor also Temporary Engineer's Assistant .....	Manchester Corp. ....	200' per an. and 50s. per week respectively .....	Dec. 31
* Inspector of Roads .....	Ilkington Vestry .....	210s. rising to 35' per week .....	Jan. 31

Those marked with an asterisk (\*) are advertised in this Number. Competitions, pp. iv. Contracts, pp. vi. vii. & viii. Public Appointments, pp. xvi. xvii. & xviii.

26,129, Standing & Dixon, Intermittent Syphonical Flushing Apparatus. 26,130, K. Lehner, Electrical Measuring Instrument. 26,131, Rowell & Bell, Fasteners for Gates &c. 26,143, P. T. L. Toelbe, "Scaffolding and Process for Carrying Out Building in Concrete." 26,147, H. S. Ilseley, Tool Grinding Appliance. 26,154, D. Tschernoff, Means for Heating. 26,155, W. Hooker, Incandescent Gas Burners. 26,165, Glover, "Time Measures for Gas Stoves and Other Lighting with Coin Feed Mechanism."

## SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.  
December 1.—By Messrs. SPELMAN (at North Walsham).  
North Walsham, Norfolk.—Norwich-rd., three building sites, f. 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Hornsey.—Frobisher-rd., f.g.r. 144, reversion in 99 yrs. 430.  
By Nokes & Stokes.  
Crouch End.—33 and 35, Middle-lane, u.t. 78 and 36 yrs., g.r. 66, 108, r. 914, reversion in 358 yrs. 750.  
By F. S. Priest.  
Haresden.—208, High-st., u.t. 82 yrs., g.r. 54, 58, r. 504, 510, 516, 522, 528, 534, 540, 546, 552, 558, 564, 570, 576, 582, 588, 594, 600, 606, 612, 618, 624, 630, 636, 642, 648, 654, 660, 666, 672, 678, 684, 690, 696, 702, 708, 714, 720, 726, 732, 738, 744, 750, 756, 762, 768, 774, 780, 786, 792, 798, 804, 810, 816, 822, 828, 834, 840, 846, 852, 858, 864, 870, 876, 882, 888, 894, 900, 906, 912, 918, 924, 930, 936, 942, 948, 954, 960, 966, 972, 978, 984, 990, 996, 1000.  
230, High-st., u.t. 85 yrs., g.r. 74, 108, r. 604, 610, 616, 622, 628, 634, 640, 646, 652, 658, 664, 670, 676, 682, 688, 694, 700, 706, 712, 718, 724, 730, 736, 742, 748, 754, 760, 766, 772, 778, 784, 790, 796, 802, 808, 814, 820, 826, 832, 838, 844, 850, 856, 862, 868, 874, 880, 886, 892, 898, 904, 910, 916, 922, 928, 934, 940, 946, 952, 958, 964, 970, 976, 982, 988, 994, 1000.  
Wendover Hall, u.t. 82 yrs., g.r. 96, 178, r. 2144, 2150, 2156, 2162, 2168, 2174, 2180, 2186, 2192, 2198, 2204, 2210, 2216, 2222, 2228, 2234, 2240, 2246, 2252, 2258, 2264, 2270, 2276, 2282, 2288, 2294, 2300, 2306, 2312, 2318, 2324, 2330, 2336, 2342, 2348, 2354, 2360, 2366, 2372, 2378, 2384, 2390, 2396, 2402, 2408, 2414, 2420, 2426, 2432, 2438, 2444, 2450, 2456, 2462, 2468, 2474, 2480, 2486, 2492, 2498, 2504, 2510, 2516, 2522, 2528, 2534, 2540, 2546, 2552, 2558, 2564, 2570, 2576, 2582, 2588, 2594, 2600, 2606, 2612, 2618, 2624, 2630, 2636, 2642, 2648, 2654, 2660, 2666, 2672, 2678, 2684, 2690, 2696, 2702, 2708, 2714, 2720, 2726, 2732, 2738, 2744, 2750, 2756, 2762, 2768, 2774, 2780, 2786, 2792, 2798, 2804, 2810, 2816, 2822, 2828, 2834, 2840, 2846, 2852, 2858, 2864, 2870, 2876, 2882, 2888, 2894, 2900, 2906, 2912, 2918, 2924, 2930, 2936, 2942, 2948, 2954, 2960, 2966, 2972, 2978, 2984, 2990, 2996, 3000.  
High-st., f.g.r. 164, u.t. 82 yrs., g.r. 104, 110, 116, 122, 128, 134, 140, 146, 152, 158, 164, 170, 176, 182, 188, 194, 200, 206, 212, 218, 224, 230, 236, 242, 248, 254, 260, 266, 272, 278, 284, 290, 296, 302, 308, 314, 320, 326, 332, 338, 344, 350, 356, 362, 368, 374, 380, 386, 392, 398, 404, 410, 416, 422, 428, 434, 440, 446, 452, 458, 464, 470, 476, 482, 488, 494, 500, 506, 512, 518, 524, 530, 536, 542, 548, 554, 560, 566, 572, 578, 584, 590, 596, 602, 608, 614, 620, 626, 632, 638, 644, 650, 656, 662, 668, 674, 680, 686, 692, 698, 704, 710, 716, 722, 728, 734, 740, 746, 752, 758, 764, 770, 776, 782, 788, 794, 800, 806, 812, 818, 824, 830, 836, 842, 848, 854, 860, 866, 872, 878, 884, 890, 896, 902, 908, 914, 920, 926, 932, 938, 944, 950, 956, 962, 968, 974, 980, 986, 992, 998, 1000.  
62 and 62A, High-st., u.t. 4 yrs., g.r. 354, r. 574, 580, 586







**CAMPBELL-STREET.**—Enlargement—boys, 72; girls, 72 infants. Providing bath, additional cloak-rooms and lavatories for all departments; removing and re-erecting boys' and girls' entrances, and providing new steps; altering seating and stepping in two class-rooms on each floor; providing additional water-closets for boys and girls, and water-closets for male infants.—  
W. King & Son ..... £28,888  
J. Longley & Co. .... 7,340  
Edwards & Medway ..... 7,590  
W. Johnson & Co., Ltd. .... 7,540

**EAST-LANE.**—Providing and fixing Kindergarten gallery in infants department:—  
Johnson & Co. .... £250  
Hick & Son ..... 171  
B. Murgrove ..... 140 15  
Jones & Graves ..... 136 10

**ELLERSLIE-ROAD.**—Heating:—  
H. C. Price Lea & Co. .... £315  
G. Davis ..... 153  
J. & F. May ..... 127  
Y. C. & J. S. Edie, Ltd. .... 133  
W. G. Cannon & Sons ..... 129

**GRAVEL-LANE.**—Enlargement—boys, 60; and removing and refitting boys' lavatory basins:—  
G. Munday & Sons ..... £779  
J. Mansland ..... 750  
E. Lawrence & Sons ..... 600  
Johnson & Co. .... 595  
F. L. Green ..... 638 10

**MILLWALL.**—Providing and planting shrubs, &c.:—  
W. J. Savage & Son ..... £31 18  
B. S. Williams & Son ..... 21  
J. H. Judge ..... 18 12

**MONSON-ROAD.**—Rebuilding the offices (all departments) further away from the school building; refitting the teachers' closets inside the buildings; altering the lavatories, new drainage scheme, and provision of drainage for higher standard rooms:—  
H. Somerset & Son ..... £3,153  
J. & C. Beyer ..... 3,451  
J. Garrett & Son ..... 3,447  
W. Akers & Co. .... 3,120  
E. Triggs ..... 3,103

**PENROSE-STREET.**—Converting school-keeper's old house into a manual training centre:—  
E. Triggs ..... £486  
W. Downs ..... 279  
W. V. Goad ..... 279  
H. & G. Mallett ..... 270

**POPE-STREET.**—Removing existing iron troughs and refitting the male and female infants' urinals with separate pans and water-waste pipe; alterations to entrance, reconstructing original providing sparge pipe, forming inspection chamber on new existing drain and providing most efficient ventilation to offices and school:—  
C. Foreman ..... £485  
Jones & Graves ..... 44  
Johnson & Co. .... 375

**PORTMAN-PLACE.**—Providing covered playground for Boys' department:—  
Johnson & Co. .... £52 10  
J. F. Holliday ..... 480  
C. Barker ..... 440 0

**"SHAFTESBURY" TRAINING SHIP.**—Providing battery for electrical installation:—  
Chloride Electrical Storage Co., Ltd. .... £248 10  
Tudor Accumulator Co., Ltd. .... 215  
D. P. Battery Co., Ltd. .... 222  
Electrical Power Storage Co., Ltd. .... 178 19  
Pritchett & Goss ..... 150 2

**UPPER HORSEY ROAD.**—Fitting up old ironing room as a physical laboratory and providing partition to form a balance-room:—  
R. A. Verbury & Sons ..... £317  
Marchant & Hunt ..... 257  
G. S. S. Williams & Son ..... 254

## C.B.N. SNEWIN

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT,  
Nos. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, & 17, BACK HILL, HATTON GARDEN, and 22, BAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS DRY, AND FIT FOR IMMEDIATE USE.  
Telephone, No. 274 Holborn. Tele. Address "SNEWIN" London.

**"SHAFTESBURY" TRAINING SHIP.**—Providing electrical installation:—  
Laird & Wharton, & Dew, Ltd. .... £1 8  
Spagnolletti & Crookes ..... 103 15 6  
G. Tate ..... 76 12 6  
Washam & Watkin, Ltd. .... 67 10  
H. F. Joel & Co. & T. Potter & Sons, United, Ltd. .... 670 0  
Woods & Co. .... 659 3 0  
Duke & Goham ..... 913 12  
Westminster Engineering Co., Ltd. .... 405 0  
Fete & Milne ..... 571 0  
Electrical and General Engineering Company ..... 785 0 0

**WELLINGTON-STREET.**—Providing covered playground for the boys' and girls' departments:—  
W. Horrett ..... £2,175 0  
E. Lawrence & Sons ..... 250 0  
J. Grover & Son ..... 616 0  
W. Shumut ..... £2,535 0  
E. Bull ..... 520 0  
Marchant & Hunt ..... 405 0  
E. T. Chichester ..... 448 10

**WESTMORELAND-ROAD.**—Providing halls for boys, girls, and infants; staircase for girls, boys, and girls' teachers' rooms, stock and cloak-rooms; additional cloak-rooms for infants; new lavatories for boys and girls; re-arranging, lighting, and re-stepping class-room for boys and girls. Revised accommodation:—Boys, 220 girls, 250, infants, 452; total, 1,022:—  
E. Triggs ..... £2,531  
E. Parsons & Co. .... 2,895  
J. Carmichael ..... 2,355  
C. Mislin & Sons ..... 6,951  
G. E. Wallis & Sons ..... 9,586  
J. & M. Patrick ..... 8,000  
F. H. & J. Higgs ..... 8,022  
W. King & Son ..... 8,350

Supply of hinged boards, on a running contract:—  
W. H. Lancelotti & Co. .... £9 11 6  
C. M. Haunmer & Co. .... 9 0 0  
J. Limited ..... 9 0 0  
Garvie & Sons ..... 8 7 0  
E. Spencer & Co. .... 8 5 0

## TO CORRESPONDENTS.

J. & N.—H. A. A. W. R. and W. amount, should have been stated.

We cannot undertake to return rejected communications.

Letters or communications beyond mere news items which have been deposited for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

## J. J. ETRIDGE, Jr.

SLATE MERCHANT,  
SLATER and TILER.

ESTIMATES GIVEN FOR  
SLATING AND TILING,

To be executed by Contract in any part of ENGLAND.

Penrhyn - Bangor,  
Oakeley - Portmadoc,

And other description of Slates Ready for immediate delivery to any Railway Station.

Applications for Prices, &c., to  
BETHNAL GREEN SLATE WORKS,  
BETHNAL GREEN, LONDON, E.

## TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 12s. per annum (24 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Japan, &c., 15s. per annum. Remittances payable to THE BUILDER, No. 46, Cannon-street, W.C.  
SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 12s. per annum (24 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

## THE BATH STONE FIRMS, Ltd.

BATH  
FOR ALL THE PROVED KINDS OF  
BATH STONE.  
FLUATE, for Hardening, Waterproofing,  
and Preserving Building Materials.

## HAM HILL STONE. DOULTING STONE.

The Ham Hill and Douling Stone Co.,  
(Incorporating The Ham Hill Stone Co. and C. Trask & Son,  
The Douling Stone Co.)

Chief Office:—Norton, Stoke-under-Ham,  
Somerset.  
London Agent:—Mr. E. A. Williams,  
16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

## SPRAGUE & CO., Ltd., LITHOGRAPHERS AND PRINTERS.

Estimate Plans and Particulars of Sale promptly executed.  
4 & 5, East Harding-st., Fetter-lane, E.C. [ADVT.]

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.

**METCHIM & SON** (GEO. METCHEM & SONS)  
"QUANTITY SURVEYORS' DIARY AND TABLES,"  
For 1899, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

## THE French Asphalte COMPANY.

Suffolk House, Cannon-street, E.C.  
SUPPLY THE BEST MATERIAL AND  
WORKMANSHIP FOR BUILDINGS,  
DAMP COURSES, AREAS, ROOFS,  
WASHHOUSE AND DAIRY FLOORS,  
&c., &c.

This Asphalte was chosen to be  
laid at Sandringham, on the new  
General Post Office, and other  
important buildings.

TWELVE GOLD AND SILVER MEDALS AWARDED.

# IRON CISTERN.

## F. BRABY & CO.

VERY PROMPT SUPPLY.

LARGE STOCK READY.

Particulars on application.

CYLINDERS FOR HOT-WATER CIRCULATION.

LONDON: 352 to 364, EUSTON-ROAD, N.W., and 218 and 220, HIGH-STREET, BOROUGH, S.E.

LIVERPOOL:  
6 and 8, HATTON GARDEN.

GLASGOW:  
47 and 49, ST. ENOCH-SQUARE.

BRISTOL:  
ASHTON GATE WORKS, CORONATION RD.



# The Builder.

VOL. LXXV, No. 977.

DECEMBER 31, 1906.

## ILLUSTRATIONS.

Royal Academy Prize Designs, 1898-1900	.....	Double-Page Ink-Photo.
Design for Mural Decoration: "Harvest."—By Mr. George Murray	.....	Single-Page Ink-Photo.
Cartoon of one of the Figures from "Harvest."—By Mr. George Murray	.....	Single-Page Ink-Photo.
Cartoon of a Draped Figure: "Calliope."—By Mr. George Murray	.....	Double-Page Photo-Litho.
"The White House," Moreton-in-Marsh—Messrs. E. Guy Dawber and Whitwell, Architects	.....	Double-Page Photo-Litho.
Monuments in the Cemetery, Milan	.....	Double-Page Photo-Litho.

## Blocks in Text.

Work done by the Lambeth Guild of Handicraft.....Pages 601, 605

## CONTENTS.

The Progress of Sanitary Engineering.....	557	Design for Mural Decoration: "Harvest".....	606	General Building News.....	608
Notes.....	559	Cartoon of a Draped Figure: "Calliope".....	606	Sanitary and Engineering News.....	609
The Prevention of Pollution of Streams and Rivers.....	601	"The White House," Moreton-in-Marsh, Gloucestershire.....	606	Stained Glass and Decoration.....	609
The Proposed London Improvements.....	603	Monuments in the Cemetery, Milan.....	608	Foreign.....	609
Glasgow School of Art.....	603	Architectural Societies.....	608	Miscellaneous.....	610
Technical Education.....	603	Trade Catalogues, &c.....	616	Legal.....	616
Lambeth Guild of Handicraft.....	604	Colston Hall Competition.....	617	Meetings.....	610
The Post-Office London Directory for 1899.....	604	British International Congress of Architects.....	617	Recent Patents.....	611
Competitions.....	606	The Decoration of St. Paul's.....	620	Some Recent Sales of Property.....	611
Books Received.....	606	The Student's Column.—Sound, Light, and Heat—XXVII.....	627	Tenders.....	613

### The Progress of Sanitary Engineering.



At the beginning of our era Vitruvius wrote: "An Architect"—and by a architect he means also engineer—"should be ingenious, and apt in the acquisition of knowledge. Deficient in either

of these qualities, he cannot be a perfect master. He should be a good writer, a skilful draftsman, versed in geometry and optics, expert at figures, acquainted with history, informed on the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences both of law and physic, nor of the motions, laws, and relations to each other, of the heavenly bodies." These words are even more true to-day than they were eighteen hundred years ago. The overthrow of the hypothesis of spontaneous generation has had far-reaching effects in regard to the prevention of infectious disease, in the design of houses, schools, and hospitals, in the construction of drains and sewers, and in the purification of water and sewage. Kepler's discovery of the elliptical orbits of planets paved the way for the adoption of the ellipse in the calculations and works of engineers. If the theory of phlogisticated air still held the ground, the details of ventilation could not yet have been worked out. If the early theories regarding the flow of water had not given way to other and better, works of water-supply and sewerage would still be designed by rule-of-thumb. Truly the architect and engineer should be "ingenious, and apt in the acquisition of knowledge."

Such thoughts as these rise naturally when we peruse a *magnum opus* like Colonel Moore's "Sanitary Engineering,"\* and trace therein the hinted story of deep-rooted

errors and empirical methods gradually making way for mathematical accuracy and scientific truth. Few departments of applied science can show greater or more dangerous errors than are revealed in the history of sanitation, but a volume like this shows the immense progress which has been made, and leads us to think that at last we are on firm ground. Opinions may differ as to the literal exactness of the Colonel's statement that "no book dealing with the subject as a whole has hitherto been issued," and as to the validity of his claim to have written so comprehensive a work as that statement would imply, but there cannot be any difference of opinion as to the greatness and value of his book. It is not a text-book to be put into the hands of the juvenile student, in the hope that by pleasant paths and easy stages he will be led to compass the wide realms of sanitary science. The man who reads it from cover to cover must be "versed in geometry" and "expert at figures," and gifted with patience and industry almost as infinite as those of the author. Not that the book is wholly *dry*, but because it is *deep*. Colonel Moore himself, however, will be the first to admit that Chapters III., IV., and V., which consist of 160 pages of calculations and figures, can scarcely be called enlivening. The most enthusiastic reader will skip the ninety pages of "Hydraulic Tables," and, like the reviewer, take it for granted that the long arrays of figures, many of them carried to nine places of decimals, are correct, but the engineer in practice will be only too glad to turn to them and so save time and trouble in his calculations, thanks to the Colonel's Herculean industry.

Chapter III. deals with "The Flow of Liquid (*sic*) in Pipes and Open Channels," and includes formulae of varying degrees of accuracy, each being carefully discussed, and the preference being given to Kutter's. The first part of Chapter IV. contains what the author calls "Hydraulic Memoranda," and refers chiefly to water-supply; the pressure in reservoirs and pipes is considered, and formulae are given for the calculation of the loss of head due to velocity, the shape of the orifice of entry, bends, &c.; the flow of water over weirs, the methods of gauging the flow of water, and various points connected with the velocity of flowing water, are also elucidated. The remaining ninety

pages of this chapter are devoted to the tables already referred to. Chapter V. will be useful to the student, as it shows the application of the formulae by means of a series of worked-out examples. We cannot pretend to have checked all the formulae and calculations given in these chapters, but as far as we have tested them they are correct. There is, however, in the diagram on page 49 an interpolation which will certainly embarrass the novice; after referring the reader to the diagram, the author proceeds to state that  $n = \tan. BDY$ ; in the illustration the angle  $BDY$  is marked and lettered as angle  $n$ , so that it appears as if  $n = \tan. n$ , which is of course an absurdity. It is only on referring to the previous page that the student will find a way out of the puzzle;  $n$  is there described as a co-efficient, its values being given for channels of varying degrees of roughness. The insertion of the letter in the diagram is unfortunate; what is meant is that the angle  $BDY$  must be such that its tangent is equal to the selected value of  $n$ , a piece of information which can be obtained by reference to any book of mathematical tables.

Although, as we have already said, the first part of Chapter IV. is devoted to hydraulic memoranda more applicable to water-supply than to any other branch of engineering, the subject of water-supply is not further discussed. The author is wise in thus setting limits to his industry, even though the provision of an ample supply of pure water is undoubtedly one of the most important departments of sanitation. Household fittings, such as baths, lavatories, and water-closets, are also a part of the same science, but architects will be disposed to argue that they scarcely fall within the scope of a work on engineering. Colonel Moore, however, thinks differently, and we are not disposed to quarrel with him for devoting two chapters of about 60 pages and upwards of 120 illustrations to this subject. If, as in so many engineering works, the subject had been treated in a perfunctory and superficial manner, we should have had just cause for complaint. It may, however, be reasonably asked whether it was necessary at this time of day to illustrate in these chapters (IX. and X.) such obsolete forms of closet as the pan, long hopper, and plug, or such antiquated traps (in Chapter VIII.) as the mason's trap

\* "Sanitary Engineering: A Practical Treatise on the Collection, Removal, and Final Disposal of Sewage, and the Design and Construction of Works of Drainage and Sewerage; with a Special Chapter on the Disposal of House-refuse and Sewage-sludge, and numerous Hydraulic Tables, Formulae, and Memoranda," &c. By Colonel E. C. S. Moore, R.E., author of "Sanitary Engineering Notes," &c., formerly Instructor in Estimating and Construction at the School of Military Engineering, Chatham. London: B. T. Batsford. 1898. PP. XXVII. and 621, 534 illustrations, and seventy "Large Folding Plates."

and D-trap; it is like slaying the slain. The space occupied by these illustrations would have been better devoted to some of the more recent forms of bath-wastes and overflows, or to the illustration and description of the new siphonic lavatories.

There are so many opinions as to the details of sanitary fittings and their connexions, that critics may well pause before venturing to criticise, but it will be generally allowed that the angular form of branch from soil-pipe to closet is not as good as the curved form. Indeed, fig. 309, in which this is shown, ought really to be described as an example of "how not to do it," for it shows a wash-out closet, the joint from earthenware to lead below the floor, the joint from lead to iron within the thickness of the wall (this defect being pointed out by the author), and an angular branch-piece from the soil-pipe. We notice also that the plug or plunger closet in fig. 277 is called a "valve-closet," and that in fig. 295 Doulton's "Simplicitas" wash-down closet is styled "Doulton's Simplicitas wash-out water-closet." But these are trifles, to which we merely draw attention in order that they may be corrected in future editions. The arrangement shown in fig. 149 is, however, a more serious matter; this, by the way, is in Chapter VI. on "Construction and Materials." We are aware that similar arrangements have been shown in many books, but have we not also seen how long-lived errors are? The illustration depicts five tiers of water-closets, all correctly connected with one soil-pipe, and with all the traps ventilated into one main anti-siphonage pipe; but the latter is carried up inside the building, while the former is out in the cold. The great aim of modern sanitary plumbing is to prevent the entrance of foul air into the house, and as the air in the anti-siphonage pipe is of the same nature as that in the soil-pipe, they ought both to be placed outside the building. If this were done in the case before us, there would be five fewer joints inside the house, and 50 ft. or 60 ft. less foul-air piping.

Chapter VIII. deals with "Traps," and immediately precedes the two chapters on "Apparatus" to which we have just referred. It is an excellent piece of work, and we cannot do better than quote the author's remarks on the failure of traps, as a typical example of his terse and lucid manner:—

"The water-lock of any form of traps, however, cannot be relied on, as it may fail in many ways—

1. By pressure of gases forcing the foul air through the water.
2. By a partial vacuum being caused by the pipes being emptied suddenly, and so drawing off the water by suction or siphonage from the trap.
3. By the evaporation of the water, lowering its level below the tongue of the trap.
4. By siphonage, such as may be caused by a piece of rag or paper lying partly in the trap with its end hanging down through the outlet.
5. By sewer gases being absorbed at the surface of the water at one side of the trap and being given off on the other side."

The danger of unsealing a trap by the momentum of the water passing through it is not mentioned, probably because this cause of failure is so infrequent; the most that usually happens is a slight lowering of the surface of the water in the trap, reducing the depth of the seal, but not destroying it altogether. Several excellent forms of stable-trap are illustrated, one of the best being that designed by the author. His grease-trap is also deserving of praise, although it may be

questioned whether a trap "made in iron, and glazed on the inside" can fairly be described as "very durable."

After sanitary apparatus and traps, we turn to the subject of drainage, and find it fully treated in Chapter VI., which deals with "Construction and Materials," Chapter VII. on "Ventilation," the part of Chapter X. on flushing, and the part of Chapter XIII. on drain-testing. "Surface-water Collection" and "Subsoil Drainage" are considered in Chapters XI. and XII. respectively, and Chapter XIII., entitled "Sanitary Notes," contains a medley of information, the principal items being those on drain-testing and the use of disinfectants. All these will prove as interesting to the architect as to the engineer. Sewerage and sewage disposal are treated in Chapters I., II., and XIV., and Chapter XV., the last, is devoted to the "Disposal of Sludge and House-Refuse."

These in brief are the contents of the book. Their arrangement perhaps leaves something to be desired. Architects and engineers, at any rate, as they would not attempt to carry out a building or scheme of sewerage without a plan, ought never to commence an important literary work without first preparing at least a sketch-plan of their undertaking. If this were done, the task of the reader would be robbed of much of its irksomeness, and subsequent reference would be facilitated. "Order, and Distribution, and Singling out of Parts," says Bacon, "is the life of Despatch." It is only the first of these that has been neglected by Colonel Moore, but as he has supplied an index of fifteen double-columned pages, the reader will doubtless forgive him.

In every branch of study there are vexed questions, and it is always interesting to see what the latest book has to say about them. Architects will probably want to know what are the author's opinions about the foot-ventilation of soil-pipes, the gradients of house drains, cast-iron *versus* stoneware drain-pipes; while engineers will probably first turn to the bacteriological purification of sewage, the ventilation of sewers, and the disposal of refuse and sewage-sludge. Space would fail us to discuss in detail even these six of the thousand-and-one subjects treated by the Colonel, but something must be said, if only for the purpose of showing the wide extent of his information and his careful statement of the difficult problems of that branch of engineering which gives the title to his book.

The arguments for and against the foot-ventilation of soil-pipes are hinted at rather than fully discussed. On page 254 we are told that "a trap or siphon is necessary at the foot of a soil-pipe, to cut off the sewer-gas from the house system, unless its use can be avoided by" an intercepting trap with air-inlet "at some distance from the building." In the chapter on ventilation, page 279, we read, "When the extremity of the extracting shaft carried up from a soil-pipe would be situated dangerously near windows, flues, &c., and the length of drain to be ventilated is considerable, it becomes necessary to place a siphon at the foot of the soil-pipe; . . . under such circumstances, the soil-pipe itself still requires ventilation, and with this object a fresh-air inlet must be provided on the house side of the trap." Some mention should surely have been made of the reasons which must have guided the London County Council in deciding that every soil-pipe must be constructed "so that there shall not be

any trap in such soil-pipe or between the soil-pipe and any drain with which it is connected." We also venture to protest against the dogmatic statement on pages 285-6, that "outside gullies for receiving slop-water from sinks should be ventilated, and for this purpose, from the drain side of these gullies, a ventilating pipe, 4-in. diameter, should run up above the eaves of the roof."

Colonel Moore clearly prefers cast-iron drain-pipes before any other sort, and sums up the matter very tersely, and, with the one exception of durability, very fully:—"Cast-iron drain-pipes are used in many instances on account of the greater security they afford against any possible escape of sewer-gas. Advantage is also taken of their extra strength in crossing open spaces, where ordinary glazed pipes would be liable to be damaged by traffic or other causes. Iron pipes, if of proper weight"—note the saving clause—"never break; they can be made of any size, and so might take the place of culverts." After mentioning their use in deep trenches in narrow streets, and "through made or unfirm ground, or where the strata is (*sic*) full of water," he continues—"A cast-iron drain-pipe may be two-thirds the diameter of an earthenware pipe or a brick sewer, as the cast-iron pipe may work full and even under pressure. They have great advantages over stoneware pipes, and are becoming increasingly used, but the cost stands in the way of their general introduction; there is less labour in laying them, as they have fewer joints, being made in 6-ft., 9-ft., and 12-ft. lengths, in place of 2-ft.; they are more accurate in form, and have less defects on the inner surface than stoneware pipes, as, with every care, the latter twist and crack slightly in the baking." It is somewhat curious, after reading that "a cast-iron pipe may be two-thirds the diameter of an earthenware pipe," to find the next paragraph entirely devoted to the statement that "a 5-in. iron pipe might sometimes\* with advantage be used in place of a 6-in. glazed pipe, as it would clear itself better." This guarded paragraph appears to throw doubt on the explicit dictum which goes before.

We are glad to find that Colonel Moore lays stress on the different conditions under which sewers and house drains are worked, and notes that gradients which are sufficient for the former may be quite inadequate for the latter. He quotes Rankine and Rawlinson as to the highest limit of velocity which may be allowed without damage to, "he conduits, and then continues as follows:—"The following maximum falls may thus be considered safe for circular pipes: for 4-in. pipe,  $\frac{1}{8}$  in.; for 6-in. pipe,  $\frac{1}{16}$  in.; for 9-in. pipe,  $\frac{1}{32}$  in. These gradients are based on the assumption the pipes are running full or half-full. House drains are usually less than half-full; the pipes, in order to be self-cleansing, should therefore have a greater inclination than that for 3-ft. velocity, and be laid when possible with falls not less than the above for the several sized pipes, but not exceeding  $\frac{1}{16}$  in." This is a point often overlooked by writers on drainage. One or two other considerations may also be advanced in support of quicker gradients for house drains than for public sewers. In the first place road detritus is often present in sewers in large quantities, and exercises a severe scouring action. Careful selection

\* The italics are ours.



of pipes and close supervision of the work of construction are more usual in the case of sewers than in drains, at least from the smaller and cheaper class of houses; and in house drains the flow very often ceases altogether, leaving a small deposit or scum, which solidifies to some extent during the dry period, and which will gradually increase with each successive intermittent flow unless the scour of the sewage is sufficient to wash it away.

The ventilation of sewers is a difficult problem, and, in the present state of our knowledge, it is scarcely to be wondered at that Colonel Moore does not feel justified in writing dogmatically on the subject. On page 269 we read that air-inlet openings "are affected by fluctuations in the flow of sewage, and also by barometric changes in the atmosphere." Four pages later he writes, "Experiments made, notably by Mr. Santo Crimp, tend to show that the direction and force of the wind is the principal factor to be dealt with in sewer ventilation." And on page 288c he quotes Mr. W. Brown, who, after many experiments, came to the conclusion that "the wind seems to have had little or no effect." Perhaps if he had seen a record of the experiments made by Mr. Richard Horton in January and February, 1897, some of these statements might have been softened by comments. Mr. Horton "ventures to place the different influences upon drain ventilation in the following order of value:—1. The relative humidity of the atmosphere; 2. The materials of which the drain is composed; 3. The wind-pressure; 4. The difference between internal and external temperature. 5. Friction."\*

The sentence on page 273 reads as if Mr. Baldwin Latham introduced the system of purifying, or rather attempting to purify, sewer-air by passing it through charcoal filters placed in the outlet-openings, and that he introduced it "about twenty years ago." Certainly, Mr. Latham did take out a patent for an apparatus for the purpose, but Sir Robert Rawlinson (then Mr. Rawlinson) advocated the use of such filters as long ago as 1862, that is to say nearly forty years ago.

We regret that we cannot discuss Colonel Moore's treatment of the questions of sewage-purification and the disposal of sewage-sludge and refuse. One quotation may be made to show how careful a guide he is. Speaking of the final disposal of sewage, he says, "The different systems described are allowed to speak for themselves, no one system having so far established its claim to universal acceptance, and special cases will always demand special treatment, although the progress that has been made during the last few years in the system of biological treatment tends to show that in this direction the ultimate solution of this troublesome problem will be found."

It has been our duty to criticise the book as well as to review it, but, after all, the criticisms we have made, or can make, are trifling when compared with the great mass of matter which is above criticism. It is a great book, involving almost infinite labour on the part of the author, and can be recommended as undoubtedly the standard work on the subject. "Tis not in mortals to command success"; but, like Cato, Colonel Moore has done more, he has deserved it.

A word of praise must not be withheld from the publisher, Mr. Batsford, for the able and generous manner in which he has seconded Colonel Moore's efforts; the type is excellent, the misprints remarkably few, the illustrations in the text most clearly drawn and reproduced, and the folding plates are models of what such plates ought to be.

We have one little crow to pluck with Colonel Moore—quite in a friendly way, of course—and then we have done. Throughout the book he has been exceedingly careful to quote the sources from which he has gathered his information, and has even gone so far as to print a "List of Authorities" extending to four pages. But neither in the text nor in this list is the *Builder* mentioned, although on pp. 595-6 he prints two tables on the strength of concrete, which first saw the light in our columns on November 19 and 26, 1892. One of these tables, on the transverse strength of concrete beams, involved a considerable amount of labour in its preparation, and we are glad to find that Colonel Moore declares that it will prove "of great service" to his readers, but surely this is all the more reason why he should have acknowledged the source whence he derived it. That the table is not taken from Mr. Sutcliffe's subsequent republication of the articles in book form is proved by the internal evidence of the table itself; besides, Mr. Sutcliffe's book is nowhere mentioned. In the transference the value of the table has been considerably reduced. As it appeared in our columns, the ages of the twenty-two tested beams were given in all cases except one, and the author drew particular attention to the importance of this part of the table; but Colonel Moore has omitted the ages altogether. When we point out that the ages of the tested beams varied from 7 to 182 days, the importance of the omission will be manifest.

#### NOTES.

LORD IVEAGH'S gift to Dublin is not only of a munificent but of a very practical kind.

At his own expense he will clear away, under parliamentary sanction, an insanitary area in Dublin, and build on the cleared space workmen's dwellings, a lodging-house for single men, shops, and various recreation buildings—a concert hall, swimming bath, reading and lecture rooms. The income derived from the dwellings is to be applied as an endowment fund for the recreation buildings, and what is not required for this purpose is to be accumulated for the purpose of building other dwellings. We need scarcely add that the buildings and money will be handed over to a body of trustees. It may, perhaps, be said that this is work which the Corporation of Dublin should do for themselves, and we are inclined to think that there is something in this. It is a scheme which is not likely to increase the public spirit of the municipality of Dublin, since it may incline them to hold their hand in other parts of the town, hoping that private generosity may take the place of general public spirit. But be that as it may, no more useful or practical way of employing great private wealth could be found than this. It has also this to be said for it, that it is a complete scheme. There is at the present time a tendency among rich men to present buildings for some public object which afterwards do not fulfil their

whole purpose for want of sufficient endowment. Lord Iveagh's scheme leaves nothing to be done by other persons; it is a completed whole.

British School at Athens.

THE new issue of the "Annual of the British School at Athens" includes several contributions

of special interest; if the high level attained in the present number can be maintained, the "Annual" bids fair to rival its older contemporaries, the "Mittheilungen" and "Bulletin" of the German and French schools. The article on "A New Copy of the Athene Parthenos," which accompanies plate IX, is by the late Director, Mr. Cecil Smith. The statuette, of which two views are shown, is unquestionably the earliest copy we have of the famous work of Pheidias. In the course of his very full discussion of the statuette, Mr. Smith makes the suggestion that the battle of the Lapithæ and Centauri was depicted not on the sandals (*soleæ*) of the goddess, but on the *anthonem*—the support of the shield—certainly a more suitable place. In the new statuette this *anthonem* is preserved. A second article of special interest is devoted by Mr. Pieter Rodeck—a student of the school—to the publication and discussion of the Ionic capital found on the site of the gymnasium of Kynosarges at Athens. It cannot be considered proved that the capital in question actually belonged to the gymnasium, but in any case Mr. Rodeck holds that the capital dates from a period at which it forms a link between the old Attic group of Ionic capitals and a later group not hitherto much noted. Mr. Ambrose Poynter contributes a paper on "Three Scitile Pavements in Greece," an instalment, we believe, of a work he has in hand on mosaic pavements in general. Five papers by various members of the school deal with special points in the excavations at Melos. Mr. Paul Perdriget, of the French school, contributes an article on some archaic reliefs—an evidence in itself of the friendly relations between the two institutions.

Open Spaces: Petersham Common.

THE Board of Agriculture, in response to a memorial addressed to them, have drawn up a scheme, in pursuance of the Metropolitan Commons Acts, 1836-98, in respect of Petersham Common. The scheme provides that the Common shall be regulated and managed by the Corporation of Richmond, who are empowered to execute drainage and other improvements, to plant trees and shrubs, and render the ground more pleasant for recreation and exercise, but are inhibited from doing anything that shall otherwise alter its natural features or interfere with free access to every part. The Richmond Town Council are also deputed to frame by-laws for the prevention of nuisances, trespasses, or injury to the Common, and for the regulation of games and of assemblages of persons thereon.

New Tapestries: Paris.

THE Municipal Council of Paris has just voted a sum of 40,000 francs for the execution, by M. J. P. Laurens, of cartoons for the tapestries intended for the Salle des Fêtes of the Mairie of the XIIIth Arrondissement, which are to be executed, at the cost of the State, at the Gobelins manufactory. The largest of the tapestries, which will include about

\* Mr. W. Spinks's article on "Drainage" in "Modern House-construction."

70 square metres of work, will cost about 190,000 francs in the working. The design will represent the "Glorification of Labour," and the various industries carried on within the limits of the XIIIth Arrondissement will be represented. In the foreground there will be a group of tapestry weavers offering homage to the genius of Colbert who contributed chiefly to create and develop this industry in France. A second panel will represent Blaise Pascal, Arnaud, and others of the Port Royal "penseurs," whose names are also connected with this district. The idea has been to illustrate on one side the labour which produces the material riches of the country, on the other the thinkers who contributed to raise its intellectual standard.

AN interesting communication Sydney Building has recently been made by Mr. James Nangle to the

"Engineering Association of New South Wales," entitled "Some Notes on Sydney Building Stones." In it the author observes that during the year rain falls in Sydney on an average 157 days; whilst the rainfall for the whole year is about 49.85 inches, which is about double the rainfall of London. In Sydney the range of temperature is severe, being as much as 36 deg. in one day. In consequence of the great rainfall, he recommends that as regards stones used for building in that city, they should absorb as little water as possible; and Mr. Nangle has made several absorption tests. His method was to prepare the stones experimented with so that they should have as nearly as possible a uniform amount of surface. All the specimens were dried at 100 deg. Cent. They were then weighed and placed in water 2 ft. in depth and adjusted on pin points, where they remained for twenty-four hours, when they were taken out and reweighed to ascertain the amount of water absorbed. For our own part, we cannot recommend this method of testing the absorptive capacity of specimens of building stones. They should not be artificially dried, especially up to such a high temperature, for microscopic cracks are almost sure to be developed or enlarged. They ought not to be placed in such deep water, the pressure of which above them prevents the escape of air from the pores of the stone, and so brings about an erroneous result. They should rather be placed in shallow water, and have one flat surface raised a millimetre or two above the level of the water, to permit the free escape of air. And the specimens ought to be weighed at intervals within the twenty-four hours, especially during the first few minutes up to half-an-hour, to gauge the rate of percolation, which it is often more important to know than the maximum percolation. In the crushing tests, carried out at the Sydney Technical College, the author was careful to see that each specimen was dressed so that at least two opposite faces (placed between the dies of the machine) were parallel. The specimens dealt with were chiefly sandstones, but igneous rocks, such as basalt, syenite, and granite, and metamorphic, including marble (some European), and slate, all used for building in Sydney, were also tested. The syenite from Gabo Island, Victoria, withstood a pressure of 11.20 tons per square inch, whilst the lowest results recorded are

amongst the sandstones, which ranged from 1.21 tons to 3.19 tons per square inch. Altogether this is a valuable contribution to our knowledge concerning the physical properties of some well-known Australian building stones.

Telegraphy  
Through  
Space.

THE extraordinary interest shown by electricians at present in what Mr. Preece calls "ætheric telegraphy" was evidenced by the crowded meeting at the Institution of Electrical Engineers last week. Three papers on this subject were down for reading, and most interesting experiments were shown by Mr. Preece, Dr. Fleming, and Mr. Evershed. Mr. Preece gave a short *résumé* of the experimental work on this subject done by the Post Office. The only permanent service they have as yet established is between Lavernock and Flatholm, in the Bristol Channel, a distance of three miles. An ingenious call arrangement, invented by Mr. Evershed, has been in constant use there for the last two years with satisfactory results. In Mr. Preece's opinion this system is cheap and practicable. Mr. Preece described an important experiment he made to try and communicate between England and Ireland. A circuit was made up from Carlisle to Haverfordwest, and another in Ireland, from Belfast to Wexford. The whole telephonic system of the country was stopped from midnight to 2 a.m. one Sunday morning in June, 1895, and attempts were made to signal. The attempt was, however, a failure as it was impossible to distinguish the signals owing to the weird noises heard in the telephone. The hum of two or three alternating current electric lighting stations could be plainly heard, but in addition there was a strange babel of sounds which Mr. Preece put down to disturbances caused by electrical effects outside our globe. If the experiment had been a success the Post Office had arranged to communicate between England and Europe and then between Europe and America in this way. In the subsequent discussion, General Webber, Sir Henry Mance, and Professor Oliver Lodge made some important statements. This was the second meeting of the Institution this month to discuss space telegraphy, but owing to the interest and importance of the subject to electricians a special meeting will be held early in January to continue the discussion.

The Arch-  
bishop's Palace,  
Canterbury.

In the building which the Ecclesiastical Commissioners will erect at Canterbury is to be incorporated some remains of the old Palace. Those portions are included in the premises lately occupied by the King's School, as reconstituted, at Cranmer's instance, by Henry VIII, upon an ancient foundation of what was really the School of the City of Canterbury, whose origin has been lately traced to a time as far back as the earlier years of the seventh century. The original Palace was built by Lanfranc in place of one which Ethelbert gave to Augustine on his retirement to Reculver circa 597, and which the Danes destroyed in 1011. Lanfranc's palace, at the north-west corner of the precincts and ville of Christ Church, was repaired by Archbishop Hubert Walter (1193-1205), who erected the great hall. Walter's work was carried on by his successor Langton (ob. 1228), and by Boniface (1241-70). It was

the scene of several famous entertainments given by the Archbishops. There were celebrated the nuptial festivities of Edward I. and Margaret of France (1299), after their marriage in the Cathedral. In Whitsun-week, 1520, Warham held a great feast in honour of the Emperor Charles V., whom Henry VIII. and Wolsey had escorted from Dover; and there Parker, who had reinstated the buildings after a fire, entertained Queen Elizabeth on her birthday in 1573. Soon after Charles I.'s death most of the materials of the Palace, including the hall and principal apartments, were sold; at the Restoration the property returned to the See, and was demised to leaseholders by Juxon. Hasted, in his "History of Kent," Vol. IV. (1791), and his book upon Canterbury (1801), relates that in his time the only remains of the Palace consisted of two buildings (by Parker) converted into tenements, opposite the west side of the cloisters, in the back part of which stood a strong flint wall, the supposed work of Lanfranc (1070-89), and part of his temporal court-house, with a house, opposite the cloister west door, built of stone rubble and flint, as repaired by Parker, whose arms appeared on its south side, and within; he mentions, too, Parker's gate-house, of brick with stone dressings, in the middle of the west side of the buildings. John Monins, a lessee in Hasted's time, built a private residence on a portion of the premises, pulling down the inferior offices and the cellarer's lodgings. In 1720 a French Huguenot chapel stood within the precincts; it was afterwards taken for a Methodist meeting-house.

No. 17,  
Fleet-street.

THIS interesting old house, *soi-disant* "the Palace of Henry VIII. and Cardinal Wolsey," is about to be rebuilt, after the designs of, we are informed, Messrs. E. J. Anson & Son. It was built, together with the Inner Temple gateway, in 5 James I., as a Council Chamber for Henry, Prince of Wales and Duke of Cornwall, whose cognisance appears upon its ornamented front. The front has been altered of late, its original form, with five pilasters against the first and second floors, and the gateway as at present, are depicted in Schenbelle's drawing of 1806. The two staircases appear to be unchanged; the most notable features of the interior are the ceiling and panelling on the west wall of the large room, 20 ft. by 23 ft., and 10 ft. 6 in. high, on the first floor. Measured drawings, with details, of the ceiling and panelling and of the later fireplace are given in "Vanishing London" (1894) by Mr. Roland Paul, who there points out that the ornamental work around the room is of different periods, that on the north, south, and east walls bearing evidence of subsequent alterations and additions. The ceiling, he observes, is probably the finest of its kind now *in situ* in London. The ribs, panels, and spaces, are ornamented with conventional foliage, in the centre are the Prince of Wales's plumes, coronet, and motto, between the letters "P" and "H"; successive coats of paint have impaired the fineness and beauty of the work. With the ceiling may be compared the similar work, illustrated by Wilkinson, in a room at Oldbourne Hall, on the east side of Shoe-lane (afterwards the site of Pontifex's copper foundry); that ceiling bore the coat-of-arms and initials of James I., his consort, and their son, Charles, within a garter, and the



date 1617, five years after Prince Henry's death. An examination of the front of the Fleet-street house goes to show that the present windows replace the old bays between the oak pilasters, the front, with its panels, having been brought forward. In Schnebbelie's view the wall screening the attic windows is inscribed "The Wax Work." Mrs. Salmon removed her show from St. Martin's-le-Grand to 189, Fleet-street, north side—see the illustration, of 1793, in Smith's "Antiquities of London"—since the site of Praed's Bank. After her death the exhibition was carried on at No. 189 by Mrs. Clarke until 1795, when it was removed to what had been "Nando's" coffee-house, at No. 17 opposite, whence, at Mrs. Clarke's death in 1812, it was taken to a house at the corner of Water-lane (Whitefriars-street). No. 17, Fleet-street, may have assumed its style of "Wolsey's Palace" from the circumstance that Sir Amys Paulet, while Wolsey's prisoner in the Temple, erected, as a fine imposed by Wolsey, the Middle Temple gate-house, "very sumptuously," says Cavendish, "garnishing the same, on the outside thereof, with cardinals' hats and arms, and divers other devices . . . that he thought thereby to have appeased his old unkind displeasure." The cardinal's arms had mouldered away by Aubrey's time.

In addition to the particulars given in our last in regard to the pavilions for foreign exhibits at the exhibition of 1900, it may be added that Hungary intends to have a pavilion representing the historic features of her national architecture, including the façade of an ancient house, part of a chapel, a bell-tower, &c. Finland proposes a structure in her national style; and Italy proposes two schemes, one of minor importance, consisting of a dome flanked by two wings; another a larger building, which will be a kind of blending of Venetian, Byzantine, and Moorish architecture. This latter will probably be the more brilliant and effective of the two, as an exhibition building, from its lighter treatment.

#### THE PREVENTION OF POLLUTION OF STREAMS AND RIVERS.\*

Why is the Rivers Pollution Act of 1876 universally condemned as a dead letter?

It has been pointed out again and again that this failure is due chiefly to the faulty and imperfect arrangements for the administration of the law, and to certain defects and difficulties in the Act itself. "The powers for taking action against pollution were entrusted to the Sanitary Authorities, and these powers are enabling, not compulsory. Now, considering that the Sanitary Authorities are too often the greatest polluters, and are constantly subjected to the influence of local and vested interests, and the incessant cry for the reduction of the rates, it is not to be wondered at that the administration of these acts has not been attended with success."†

Great hopes were entertained that, with the establishment of County Councils by the Act of 1888, the indifference and opposition of interested or ignorant individuals and of the smaller local authorities would be overwhelmed and carried along by the larger and more powerful organisation. Unfortunately the administration of the law for the prevention of pollution, which is still purely optional, is from its very nature unpopular, and likely to be avoided. It can only be carried out thoroughly by men who will systematically devote much time and care to

this duty, and will not be unduly influenced by local and vested interests, or by the clamour of short-sighted and parsimonious ratepayers. Several of the County Councils, no doubt, have done, and are doing, much for the prevention of pollution. But all efforts for improvement must be hampered and curtailed by the defects and difficulties at present existing in the Act of 1876.

What are those defects and difficulties?

Chiefly as follows:—

1. The vagueness and incompleteness of many of the terms, such as the definitions of polluting matters, liquid sewage, &c. (Clauses 2 and 3).
2. The expense, delay, and uncertainty involved in the restrictions imposed when any authority proposes to enforce the enactment for preventing pollution.
3. The absence of deterrent penalties.
4. The absence of power of entry.

These defects are a serious impediment to action, as the joint committees of the Mersey and Irwell and of the West Riding of Yorkshire soon discovered when they began seriously and systematically to deal with the overwhelming sources of pollution which prevailed in their respective districts. No time was lost by these committees in appealing to Parliament for special Acts "To make more effectual provision for prevention of pollution" on the ground that "the restrictions contained in the Act (of 1876) were such as to preclude effective action." Parliament acknowledged the justice and the reasonableness of the appeal by giving assent, and the necessary Acts were passed.

Now it is quite certain that everyone, local authorities, or individuals in the kingdom who have concerned themselves with the abolition of iniquitous pollution, must have felt the necessity of these reforms, the remedying of the defects which I have mentioned. And yet a Bill, a private Bill, which embodies all these reforms has been before the House of Commons for years. This Bill, modelled on the Acts of the Mersey and Irwell Joint Committee and the West Riding Rivers Board, remedies the defects which I have mentioned. It defines and catalogues the various possible kinds of polluting effluents, grants powers of entry to authorities for the taking of samples, and whilst it amply protects the manufacturer from undue embarrassment and expenditure, it provides for the proper administration of the law, and the infliction of appropriate penalties upon actual offenders with as little cost, delay, and uncertainty as possible.

Dr. Maclean Wilson, in his introduction of the discussion on rivers pollution at Edinburgh, pointed out that "the Bill as it stands at present is weaker in several respects than either of the Acts upon which it is based." He also goes on to say: "The following are some of the points left undecided by the present Bill; the settlement of the question of the right of a manufacturer to discharge his trade refuse into a public sewer, or of the right of the sanitary authority to refuse to allow him so to discharge it; the prohibition of the sludging of mill dams; the power to cause obstructions to the flow of stream to be removed; the absolute prohibition of any new pollutions; the proper supervision of the discharge of compensation water." These details, it must be admitted, are of first-rate importance, and any conclusions dictated by the experience of these two active rivers boards is bound to command attention and respect.

On the other hand, one cannot be too careful about overloading any proposed reforms with contentious details. It will be for those in charge of the Bill to decide whether and how many of these additional clauses should be added.

The amendment of these intrinsic defects in the Rivers Pollution Prevention Act will, without doubt, greatly facilitate and promote the abolition of much of the lawless and disreputable pollution which prevails throughout the United Kingdom. There still remains, however, the great difficulty of getting councils, boroughs, and county boroughs to combine and insist that the law shall be duly observed throughout the whole watersheds in which they are situated. A Borough or a County Council may do its best to set its own house in order to prevent and abolish all pollution within its borders, but it is almost powerless to remove pollution—except when of the grossest and most intolerable kind—in parts of the stream and rivers which are higher up. The sources and tributaries of a river, for instance, which are above a given town

or county, may each contribute its share of pollution, until the sum total of impurity in the main stream becomes intolerably offensive. Yet it will be very difficult to bring conviction home to the individual offenders. The solution of the difficulty lies in the formation of joint committees, who shall have the supervision and control over whole watersheds, or groups of streams and rivers: committees which shall be fairly representative of all the local interests concerned—of Councils and water companies, manufacturers, and industries—strong and extensive enough to resist the undue influence of local interests and local jealousies, and to overcome the *vis inertiae* of ignorance and indifference; and whose sole business it shall be to administer the law promptly and without fear or favour for the protection of the waters within their district.

This is no paper scheme based on theoretical considerations. The Act of 1888 provides for such an organisation in Clause 81, whereby the formation of such joint committees is sanctioned and regulated. The idea of the watershed as a proper area for administration is not at all new, but has been advocated by many competent authorities. In April of this year Mr. Middleton read a very interesting paper to the Institute on the desirability of making watershed areas and sanitary districts coterminous. This proposition, however commendable, involves such a revolution and such an intricate shifting and resetting of our whole social organisation, that it is not likely to find much favour. But for the constitution of joint committees for the prevention of pollution no new authorities are required. The existing authorities, who have not sufficient time, and who for reasons previously mentioned are not well qualified to carry out the work thoroughly, will merely depute their office to an authority provided for and sanctioned by the existing statute.

Fortunately there are joint committees, two of them established long ago, which, in their constitution, methods of work, and results produced, present excellent models for the whole kingdom, viz., the joint committee known as the Thames and Lee Conservancy Boards, the Mersey and Irwell Conjoint Committee, the West Riding River Board, and the Ribble Joint Committee. The methods employed and the results obtained by these joint committees are, I believe, but little known throughout the kingdom, and, as I have been studying this subject for some time, I will summarise as briefly as possible the information which I have acquired.

The Thames Conservancy Board is a representative body consisting of thirty-eight members appointed or elected by the Admiralty, the Board of Trade, the Trinity House (for control over the "lower navigation" especially), by eighteen County Councils and Boroughs (including the London County Council), the Corporation of London, the metropolitan water companies, by shipowners, owners of sailing barges, dockowners and wharfingers. It is the oldest authority for prevention of pollution powers for this purpose having been conferred upon it by Act of Parliament in 1566. Originally these powers were limited to the main stream, and to the parts of its tributaries within three miles of the main stream. By subsequent Acts these powers were extended to ten miles up the tributaries; but were found to be inherently defective, as it was necessary to prove that pollution reached the main stream, and this was most difficult to do to the satisfaction of magistrates. Evidence was given before Lord Balfour's Commission in 1892 to this effect, and a recommendation was made by that Commission that powers should be extended to every part of the Thames Basin, and that it should be an offence to pollute a tributary, irrespective of the point whether the pollution reached the main stream. This recommendation was carried into effect by the Thames Conservancy Act of 1894, which re-constituted the Thames Conservancy on lines more representative than theretofore. The Conservators now have jurisdiction for prevention of pollution to the very sources of the Thames and its tributaries, an area of nearly 4,000 square miles above the western limit of the metropolis, as well as within narrowed limits below that point. In the midway great results have been effected by the manner in which the London County Council have treated the sewage of London. This, which was formerly discharged untreated into the river, is now dealt with in precipitation tanks and the solids are carried away to sea instead of passing into the Thames.

\* Part of a paper read by Dr. Childs at the recent Sanitary Congress at Birmingham.

† "Waterborne Typhoid Fever," Jour. San. Inst. Vol. XIX., p. 248.



Above the tideway, or rather above the western limits of the metropolis, the 4,000 square miles above referred to, the Conservators have a chief inspector, seven inspectors, and eight assistants, whose work is divided into seven districts, an inspector and an assistant each working in one of these. Bicycles are used as a means of rapid transit. Reports are received from those officers on every town, village, and hamlet in the area. Notices have been served on all persons polluting, and reasonable time is given to carry out works for diversion. About 5,000 inspections are made yearly. Samples are constantly taken and analysed by the Thames Conservator's Analyst, Mr. C. E. Groves, F.R.S. These analyses now amount to 1,800 a year. The results of the Conservators' action are as follows:—

Summary showing the results of the action taken by the Conservators.

	Places.	Population.	Percentage of whole population.	No. of Inspectors in 33 years.
<b>Above the Intakes of the Metropolitan Water Companies.</b>				
No pollution discovered ..	50	210,705	10.1	5,420
Pollution diverted .....	362	437,443	40.0	6,122
Pollution not entirely diverted, but in course of diversion .....	107	254,818	23.4	2,583
Pollution not diverted ....	86	186,104	17.5	2,408
	1,145	1,092,107	100	16,539
<b>Below the Intakes of the Metropolitan Water Companies, but above the Western Limits of the Metropolis.</b>				
No pollution discovered ..	10	6,248	1.2	121
Pollution diverted .....	52	334,750	65.7	1,065
Pollution not entirely diverted, but in course of diversion .....	21	147,634	29.0	440
Pollution not diverted ....	10	20,917	4.1	164
	105	509,549	100	1,821

Mr. Groves says (June, 1898):—"I might here point out that, owing to the action taken by the Thames Conservancy under the Act of 1894, the amount of organic impurity dissolved in the water immediately above the intakes is now only about two-thirds of what it was before the passing of that Act." On the authorities who have not taken action the Conservators are bringing pressure by proceedings before the magistrates, with great success.

The above statements will serve to give some idea of the methods of work and results attained by a joint committee of the largest and most important watershed in this country. Not a spring, brook, or stream flows into our greatest river that does not come sooner or later under the supervision of the Board's inspectors; and it is difficult for the slightest pollution to escape detection. Much still remains to be done, for even from prehistoric times individuals and communities have clustered on the banks of the Thames and its tributaries, each to contribute its share of filthy refuse to the stream; and owing to the rapid growth of village, town, and city in the present century, more than a million souls inhabit the banks on the tributaries or main river above the intakes, and more than five million below the intakes of the London water companies—a total equal to nearly one-fifth of the whole population of England and Wales.

For the abolition of such widespread pollution time is of necessity required, partly owing to the legal subterfuges through which offenders can escape from the performance of their duties, partly from actual local difficulties of dealing with sewage (such as are due to clay soil, lowness of level, &c.), and partly because of the uncertainty which prevails with regard to the best practical means available for purifying the effluents. Nevertheless the great work of purification progresses steadily, and it hardly needs the analysis of the chemist to show how greatly pollution has decreased since the Conservancy Board was entrusted with the task of preventing it. The history of the prevention of pollution as carried out by the Thames Conservancy Board plainly shows the great advantages to be gained by a combination of representative authorities on a large scale—through which combination economy and effectiveness are secured. By obtaining control over the sources and tributaries of the

river immense advantages are gained, much constant and futile litigation is replaced by authoritative and successful action, and consequently much time, labour, and money are saved. Such desirable results, it appears, are almost impossible to obtain through the action of isolated and comparatively weak local authorities.

The jurisdiction of the Lee Conservancy Board extends over the whole watershed area of the River Lea, an area of nearly 600 square miles. The main river and all its tributaries are under the control of the Board, and provide a water supply to nearly two and a half million individuals. The present Board of Conservancy was established by the Lea Conservancy Act of 1868, and resembles the Thames Conservancy Board in its representative character. A very interesting account of this Board and its works, together with a graphic description of the River Lea, its tributaries, and surroundings, is to be found in the excellent paper entitled "The River Lea up to Date," which was written by Major Lamorock Flower, especially for the Sanitary Institute in 1893. From this history many most useful and practical lessons may be learnt. The inspection, the patrol, the safeguarding of this important river, from the main stream up to its smaller contributing sources, have during the last seven-and-twenty years been carried on by one individual—Major Lamorock Flower himself. Major Flower has always advocated individual action, in preference to action by committee, for securing the abolition of pollution. He has insisted that a competent man entrusted, empowered, and controlled by the constituted Board, can, through his personal influence, guided by tact and judgment, succeed far better in inducing polluters to abate their nuisances than mere ordinary officials, instructed by resolutions of committee, and armed with the hateful legal notice, which usually excites the wrath and all the combative tendencies in him upon whom the notice has been served.

By exploring the valley of the Lea, either on foot or by water, you may see with your own eyes continuous evidence of pollution which has been diverted, or which is incessantly kept back, through the energy and watchfulness of the Board's entrusted agent. The history of the river Lea also illustrates the fact that much pollution of our streams and rivers is often caused unconsciously by owners of adjoining land or house property; and that such persons, when their offences are brought before them by the right person and in the right manner, are, in many cases, only too ready to remedy the evils for which they have unknowingly been responsible. One blot in the Lee Conservancy Act cannot be passed unnoticed, viz., the clause which allows the carriage of house refuse, manure, and gas lime on the river, generally in very old and leaky barges. With regard to economy and cost. It might be thought that for the provision of such extensive and incessant supervision and control, a very large expenditure would be involved. Such, however, is far from being the case, when the supervision and control are carried on under the direction of combined boards, especially if we consider the vital importance of these measures, and the vast number of people who are thus protected. In the case of the Lee Conservancy, at any rate, the total annual expenditure for all this supervision, inspection and prevention of pollution amounts to a sum which, if charged to the water consumers, would be represented by a rate of a small fraction of a penny per annum.

The Mersey and Irwell Joint Committee and the West Riding Rivers Board were constituted by Provisional Order of the Local Government Board, the former in 1891, the latter in 1893. The Mersey and Irwell Joint Committee consists of representatives of the counties of Lancaster and Chester, and of the county boroughs of Bolton, Bury, Manchester, Oldham, Rochdale, Salford, and Stockport, representing in 1898 a population of nearly 2½ millions. The West Riding Board consists of members elected by the West Riding County Council, and by the county boroughs of Leeds, Sheffield, Bradford, Halifax, and Huddersfield. Each of these joint committees soon found out how defective the Rivers Pollution Act of 1876 was, and almost within a year after their constitution sought for and obtained special Acts, upon the ground that "the restrictions contained within the said Act (1876) are such as to pre-

clude effective action by the joint committee." It is on these two private Acts (which are almost identical) that the Bill of Sir Francis Powell is modelled.

The Thames and Lee Conservancy Boards have to deal almost entirely with domestic sewage. The task and difficulties of the Conjoint Committees of the Mersey and Irwell and of the West Riding are enormously complicated by the great preponderance of "trade effluents," by a mass of pollution which has rapidly accumulated during the last twenty or thirty years, and by the large and powerful industries which they are called upon to tax and correct, in order to obtain right and lawful purification of the polluting effluents. Thus Mr. Tatton, Chief Inspector of the Mersey and Irwell Board, reports in 1898, 60 sewage effluents in his district, 210 trade effluents passing into sewers, and 410 into rivers, whilst in the West Riding, Dr. Wilson reports 332 sewage disposal works and 2,103 trade effluents, 866 of which pass into sewers, and 1,297 into streams.

The method of procedure of each of these Committees appears to be very much the same:—

1st. A considerable time was spent in inspecting, surveying, reporting, and classifying the various effluents throughout the whole district. At the same time manufacturers were approached in a friendly spirit, advised where they were transgressing the law, and made acquainted with the powers of the Conjoint Committee. The effect of these steps has generally been to bring about a considerable amount of voluntary reform and improvement. The next step has been to send round notices requiring that a scheme for the purification of the trade effluents should be adopted where it was required. From this further improvements have resulted. After allowing due time, pressure has been brought to bear, and ultimately action has been taken in cases where the offenders omitted or refused to comply with the requirements of the Board. In this way steady though slow progress has been made. So far as I can judge from the evidence before me, every consideration has been shown by the Committees to the manufacturers, so as not to embarrass them unduly or interfere unfairly with their industries; ample time has been allowed for elaborating schemes for purification; and every possible assistance and advice has been given by the Committee to help in the accomplishment of this oftentimes difficult and complicated task. On the other hand, the manufacturers, as a rule, appear to have met the committees in a liberal and fair spirit, although to many of them the cost of constructing works has been very considerable. In the West Riding definite improvement is already evident in the manufacturing and sewage pollutions, and more especially in the solid pollutions, although the Board has been in action for a comparatively short period.

The fine laboratory of the Board, which was brought into use in September, 1897, gives every facility for analysis of sewage effluents and trade refuse. On visiting there in June, through the kindness of Dr. Wilson and Mr. Halliwell, I had the opportunity of studying a most instructive pathological collection of nearly every kind of foul trade refuse. Experiments on the treatment of these effluents are being carried on in the laboratory, and it is hoped that the experimental work will be of great use to manufacturers in assisting them to discover the best means of purifying their trade refuse.

In the Mersey and Irwell District, which had two years' start of the West Riding, the resulting improvements are still more marked. Very few trade effluents remain untreated. The upper tributaries of the rivers are palpably clearing. The deposits of cinders and sludge lower down are very much diminished. It is encouraging to find that the manufacturers are already benefiting, in that the water supplied to them requires less sedimentation and filtration before use in their mills, &c., whilst the foul materials which used to pollute the river are in several instances recovered with profit to the manufacturer, notably in paper making and coal washing, thus illustrating the wise adage that "dirt is but matter in the wrong place." In all probability it will be found that materials of some value may be extracted from most trade effluents.

If such improvements can be produced in the face of such difficulties, there seems no reason why the purification of our streams and rivers



should not be accomplished quickly and steadily, if the Act of 1876 be reformed in the few necessary details, and if conjoint committees, organised on the same lines as those on the Thames, Lea, Mersey and Irwell, West Riding and Ribblesdale, having control over whole watersheds, or groups of streams and rivers, be established throughout the country.

#### THE PROPOSED LONDON IMPROVEMENTS.

The following is the text of that portion of the Improvements Bill promoted by the London County Council (to be cited as "The London County Council (Improvements) Act, 1899") which defines the nature and extent of the proposed improvements:—

"4. Subject to the provisions of this Act in the lines or situation and within the limits of deviation shown on the deposited plans and according to the levels shown on the deposited sections the Council may execute the works hereinafter described viz:—

##### New Street (Holborn to Strand).

A new central street in the parishes of Saint George Bloomsbury, St. Giles-in-the-Fields and Saint Clement Dances to commence in the parishes of Saint George Bloomsbury and Saint Giles-in-the-Fields in High Holborn opposite the southern end of Southampton-row and to terminate in the parish of Saint Clement Dances at or near the northern corner of the site now occupied by the Olympic Theatre;

A curved street in the parishes of Saint Mary-le-Strand, Saint Martin-in-the-Fields, Saint Paul Covent Garden and Saint Clement Dances to connect the new central street with the Strand at two points; the eastern end of such curved street to form a junction with the Strand as proposed to be widened at or near the point where Wychna-street and Holywell-street now open on to the roadway west of Saint Clement Dances Church and the western end of such curved street to form a junction with the Strand between Catherine-street and Wellington-street.

In connexion with the said central and curved streets subsidiary streets or junctions with existing streets as follows:—

- (1) A junction street in the parish of Saint Giles-in-the-Fields between the central street and Little Wild-street;
- (2) A junction street in the parishes of Saint Giles-in-the-Fields and Saint Clement Dances between the central street and Lincoln's Inn-fields;
- (3) A junction street in the parishes of Saint Giles-in-the-Fields and Saint Clement Dances between the central street and the existing point of junction of Great Wild-street and Kemble-street;
- (4) A junction street in the parish of Saint Clement Dances between the new street and Clare-street and Clare-market;
- (5) A junction street in the parish of Saint Clement Dances between the curved street and Houghton-street;
- (6) A new street in the parishes of Saint Martin-in-the-Fields, Saint Paul Covent Garden and Saint Mary-le-Strand on the site of that part of Exeter-street which is situate between Wellington-street and Catherine-street.

##### Southampton-row Widening.

(1) The widening of Southampton-row in the parish of Saint George Bloomsbury on the eastern side thereof such widening to commence at Vernon-place and Theobald's-road and terminate at Holborn;

(2) The widening of High Holborn in the parish of Saint George Bloomsbury on the northern side thereof such widening to commence at the southern end of Southampton-row and to extend to a point 50 yards or thereabouts eastward from the centre of the roadway of Southampton-row;

(3) New street to commence in Kingsgate-street in the parish of Saint George the Martyr Holborn at the western end of Fisher-street and to be continued into Southampton-row;

(4) New street to commence in Kingsgate-street in the parish of Saint George the Martyr Holborn and the parish of Saint George Bloomsbury at the western end of Eagle-street and to be continued into Southampton-row.

##### Wandsworth-road (Lambeth Widening).

A widening of Wandsworth-road in the parish of Saint Mary Lambeth on the southern side thereof such widening to commence at a point about sixty yards eastward from the junction between Nine Elms-lane and the Wandsworth-road and to terminate at or near the junction of Bond-street and the Wandsworth-road opposite the South Metropolitan Gas Company's works.

##### High-street Kensington Widening.

A widening of High-street Kensington in the parishes of St. Mary Abbot Kensington and St. Margaret Westminster on the northern side thereof near St. Mary Abbot's Church.

A new roadway in the parish of St. Mary Abbot Kensington from Clarence Mews to Kensington High-street.

##### Cat and Mutton Bridge Shoreditch.

The taking down and removal of the bridge over the Regent's Canal known as the "Cat and Mutton" Bridge in the parishes of Saint Leonard Shoreditch and Saint John Hackney and the reconstruction of the same with improved approaches thereto.

##### Old Gravel-lane Bridge Saint George-in-the-East.

The taking down and removal of the swing bridge over the London Dock Cut at Old Gravel-lane in the parish of Saint George-in-the-East and the construction of a new bridge on the site thereof.

The most important provisions of the Bill, in their bearing on the public, are perhaps that which refers to the power to take property under the "Housing of the Working Classes Act, 1890," and that which refers to what is called the "Improvement Area." The provisions in relation to the Housing Act are as follows:—

"20. The Council may claim in any notice to treat for the purchase of any lands intended to be taken for the purpose of this Act:—

That the lands to which the notice refers are or comprise any houses courts or alleys unfit for human occupation;

That the narrowness closeness and bad arrangement or the bad condition of the streets and houses or groups of houses upon any such lands or the want of light air ventilation or proper conveniences or any other sanitary defects or one or more of such causes renders any such lands or any buildings thereon prejudicial to the health of the inhabitants either of the buildings on the said lands or of the neighbouring buildings;

And in the event of any such claim then on the occasion of assessing the amount of compensation payable in respect of such lands the court or person settling the same shall determine whether such lands fall wholly or in part within any of the descriptions hereinbefore mentioned and if they shall so decide then in assessing the compensation payable under this Act in respect of any such lands evidence shall be receivable by such court or person to prove:—

(1st) That the rental of any house or premises was enhanced by reason of the same being used for illegal purposes or being so overcrowded as to be dangerous or injurious to the health of the inmates;

(2ndly) That any house or premises are in a state of defective sanitation or are not in reasonably good repair; or

(3rdly) That any buildings on any such lands are unfit and not reasonably capable of being made fit for human habitation;

and if such Court or person be satisfied by such evidence then the purchase-money and compensation in respect thereof shall be assessed and determined according to the principles indicated in Section 21 of "The Housing of the Working Classes Act 1890."

The following is the main statement in regard to Improvement Area and Improvement Charges, which refers only to the property contiguous to the new street from Holborn to the Strand:

"42. And whereas the new street (Holborn to Strand) by this Act authorised will or may substantially and permanently increase in value lands in the neighbourhood of that improvement which will not be acquired for the purpose thereof and it is reasonable that provision should be made under which in respect or in consideration of such increased value a charge should be placed on such lands. Therefore the following provisions shall have effect, viz:—

(1) In and for the purposes of this part of this Act:—

The expression—

'The Improvement Area' means—

The areas shown on the deposited plans within the line thereon indicating the limits within which an improvement charge may be imposed;

'The Improvement' means the new street (Holborn to Strand) by this Act authorised.

Owner means where the hereditament is copyhold the person or persons entered on the roll of the manor and entitled to enfranchise the same.

Lands shall extend to messuages lands tenements and hereditaments but shall not include any main pipe or apparatus of any Company supplying gas or water under the powers of any Act of Parliament or any culvert pipe tube apparatus or wire of any Electric Lighting or Hydraulic Company authorised by any Act of Parliament or Telephone Company acting under a license from the Postmaster-General or any estate or interest in land of or belonging to any such Company in respect of any such main pipe apparatus culvert tube or wire.

(2) All lands within the Improvement Area but which shall not be purchased and taken by the Council under the powers of this Act shall be liable to have an Improvement charge placed on such lands or some of them (in accordance with the provisions hereinafter set forth) in respect or in

consideration of any substantial and permanent increase in value which it is clearly shown has been derived from the Improvement."

Then follows, at considerable length, the detailed statement as to the manner of procedure to be adopted in assessing such improvement charges. This appears to be a "betterment" under another name. It is a provision which may be right and justifiable in itself, but which seems likely to lead to a great deal of litigation.

#### GLASGOW SCHOOL OF ART.

The fourth lecture of the series, by Mr. W. J. Anderson, on "The Architecture of the Renaissance in France" was delivered on the 19th inst., when the second part of the central period, the work of Henri Quatre and Louis Treize, was considered. During these reigns the châteaux at Fontainebleau, Blois, Chenonceaux, &c., were advanced; while the city of Paris was materially improved and adorned. The use of brick, of rustication and vermiculated stone dressings, the introduction of the square domed pavilion, and of the round dome as an external feature of churches, all belong to this period. But the most interesting thing is the development of the ornament. The introduction of the colossal order tends to increase the heaviness of the decoration, while decadent Florentine influences affect its character. The mask and tightly-drawn festoons of cloth and ribbons distinguish the ornament of the Henry IV., reign, while cherub heads and drooping palms point to that of Louis XIII. The return to nature about the middle of the period loses itself in the imitation of the trophies and panoplies of war, and, anticipating the styles of the Empire, leads on to that of the great reign of Louis XIV. Throughout the period naturalism is kept in check by a severe and broad use of the classic orders, marred only by a somewhat trivial treatment of the surfaces and mouldings. Among examples of the period illustrated were the Gallery of the Stags, the Baptistery and the Chapel of the Trinity at Fontainebleau, the gallery connecting the Louvre and Tuileries, the Palais du Luxembourg, the additions to Blois, with details of the staircase of F. Mansart, the Hôtel Sully, and the Sorbonne Church in Paris.

#### TECHNICAL EDUCATION:

##### WORK OF THE TRADES TRAINING SCHOOL.

At Carpenters' Hall, London-wall, on the 22nd inst., the Duke of Fife distributed the prizes in connexion with the Trades Training School, carried on at 155, Great Titchfield-street, W. The chair was taken by Mr. J. C. Preston, Master of the Carpenters' Company.

Professor Banister Fletcher, Chairman of the Committee, reported an increase in the students attending the schools, who now numbered 291. The Committee still pursued the system first adopted, rigidly excluding all those not in the trade, except in the case of young architects.

General Laurie, M.P., in proposing a vote of thanks to the Duke, said that no company according to its resources did more for technical education than the Carpenters' Company. The Rev. Dr. Wace seconded the resolution, and pointed out that it was only in such workshops that a mastery of the work could be obtained.

The Duke of Fife, in reply, said that no more appreciated the splendid work being done in these schools for the cause of technical education. The battle was now won—not the battle of trade competition, which would last as long as the world itself, but the battle of argument, which was necessary to convince the people of this country that the national existence was at stake. If the workman of to-day would only take advantage of the opportunities placed within his reach he would become not only a useful but a valuable member of the community, and would enhance the real dignity of labour.

Dr. Garnett (Secretary of the Technical Education Board) afterwards proposed a vote of thanks to the companies associated in conducting the schools, and expressed the hope that efforts would be made to put London boys on a more equal footing with their provincial competitors with regard to the facilities offered them to enter the building trades and obtain a thorough training. This resolution was seconded by Mr. H. Phillips Fletcher (Secretary of the Judging Committee) and adopted.



## ALTAR IN CHAPEL CAMBRIDGE HOUSE. IN SEQUOIA



FINE. PAINTED BY W.A. CHASE. DESIGNED BY C.H.B.

SIDE PANELS MODELLED IN GESSO AND COLOURED. QUENNELL.

W. CVRTIS GREEN DEL.

Work done by the Lambeth Guild of Handicraft.

## LAMBETH GUILD OF HANDICRAFT.

A NEW artistic society has been started in South London at 44, Kennington-lane, known as the Lambeth Guild of Handicraft. The Guild is a society of artists and craftsmen working under the direction of an architect, Mr. C. H. B. Quennell. The arts and trades worked in are joinery and joined furniture, metal work, decorative painting and stencilling, tapestry and embroidery, modelling, casting in metal and plaster.

The aim of the Guild is to give the public useful and ornamental furniture of sound material and good design. The present day reaction from complexity to simplicity amounts to almost skeleton baldness, and the Guild insists that besides a design expressing the purpose for which the object is intended, it should also give a little pleasure by delicate and strenuous line and the insertion of some inlaid ornament. In the Credence table, for instance, of which we give a sketch, the simplicity of the joinery is relieved by the ebony pegs, gouge cuts, and inlaid hearts of mother-of-pearl.

The other sketches represent various work done by the Guild, and sufficiently explain themselves.

## THE POST-OFFICE LONDON DIRECTORY FOR 1899.

THE 100th annual publication of this Directory (Kelly & Co., Limited) contains 3,276 closely-printed pages, exclusively of the advertisements, being an increase of 177 pages over those in the edition for the now passing year. The increase is mainly due to the fact that more than 600 new streets are added as the result of an extension of the limits of the work, in fulfilment of a promise made last year by the proprietors in view of the now accomplished 100th edition. They point, with legitimate pride, to its publication annually for 100 years in succession, as unique in this country. The Suburban Directory will in future appear annually, and the Local Suburban Directories are henceforth to be bound in cloth, without an advancement in their price. One of the latest corrections in the body of the book is the

appointment, on December 7, of Mr. H. De la Bere as Director of the Royal Army Clothing Department.

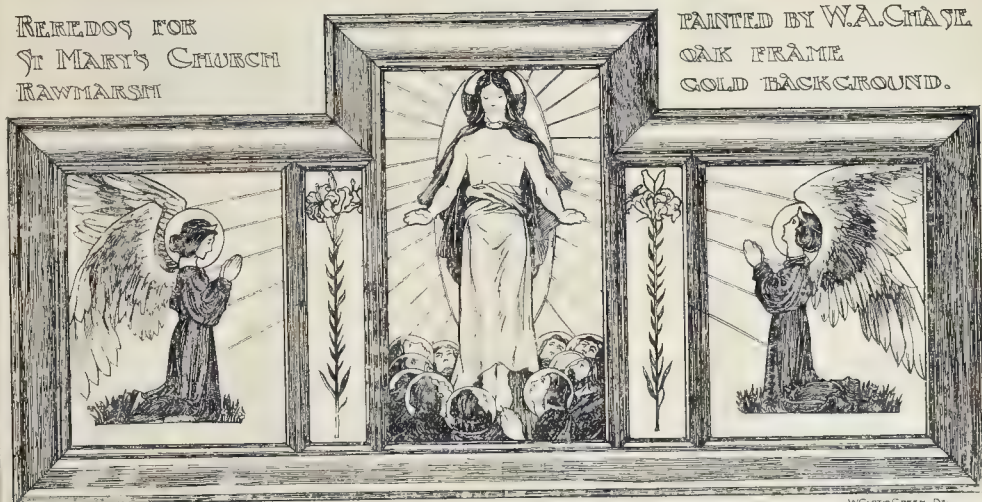
With this volume Messrs. Kelly & Co. celebrate the centenary of a publication that has its origin in a book of 292 pages, small octavo, first published in 1800 under the Postmaster-General's patronage, by two members of the staff, for whom the particulars were collected by the district letter-carriers. That arrangement continued until sixty years ago, when the publication was taken over by Mr. Frederick Festus Kelly, Chief Inspector of Letter-Carriers, and his brother, Mr. William Kelly, who established the present firm at a house in Old Boswell-court, where they remained until the site was cleared for Street's Royal Courts of Justice. In the introduction of the present issue is a facsimile of the title page of the "New Annual Directory"; its pages 2-250 contain the names, addresses, and callings of between eleven and twelve thousand of the more eminent merchants, traders, dealers, attorneys, factors, &c., and it is noteworthy that many of the first-named category still followed the old custom of transacting their business in the City coffee-houses; on pages 251-2 is a list of bankers; the rest of the book is devoted to official notices, tables of rates and limits of postage and deliveries, nominal lists of various directorates, and so on. The charges for "single letters" range from 3d. for a maximum of fifteen miles to 8d. for any distance exceeding 150 miles—in England, the rates for Scotland are higher; in Ireland the charges from London vary from 8d. to Dublin and Waterford to 1s. 7d. to Killybegs and Ardee. The Act of 9 Anne, c. 10, enacts that there shall be "one general letter office and post office . . . within the City of London . . . and that one master . . . shall be appointed . . . by the name and style of Her Majesty's Postmaster General," and excepts from the tables of rates all "letters and packets . . . by the carriage called the Penny Post . . . within the Cities of London and Westminster and Borough of Southwark . . . to be received and delivered within ten English miles distant from the said General Letter Office in London, one Penny." The General and Chief Penny Post Office

for purposes of the Act was situated by the churchyard of St. Christopher-le-Stocks, which forms the resting place of Galileo's contemporary, Harriott, the astronomer and mathematician, and tutor of Sir Walter Raleigh, and is now the garden in the Bank of England. We should explain that a letter weighing less than 1 oz., and consisting of one piece of paper, paid single postage, whilst letters of two or three or more pieces of paper were "taxed" double or triple postage. The old penny post—abolished in 1801—which had obtained also in the large provincial towns, was first established as a foot-post in London, on March 25, 1680, by the joint enterprise of Murray and Dockwra, who opened receiving-houses in Lime-street, and "Hall's" coffee-house, Wood-street; a monopoly of the Post Office revenues had been granted by Charles I. to Thomas Withering, at Sherborne-lane, and in 1663 to James, Duke of York. The head office was subsequently removed to Cloak-lane, Dowgate-hill, thence to the "Black Swan" in Bishopsgate-street, to the "Black Pillars" in Brydges (now Catherine-street), Covent Garden, and then, in 1690, to Sir Robert Vyner's house in Lombard-street, where it remained until the opening, in 1820, of Smirke's building, described in our recent "Note" (p. 548 ante.)

Messrs. Kelly & Co. reproduce a very uncommon map of London published by J. Evans, of 12, Long-lane, West Smithfield, on January 1, 1799, drawn to a scale just twice that of their own which is surveyed expressly for their Directory. Evans's map is a fine specimen of cartography of its time, with clear lettering—and the reprint, executed by Messrs. Layton, is a successful rendering of the original. The two maps, contrasted *inter se*, graphically illustrate how the town has altered and expanded during the last hundred years. Evans's map shows an area covered with streets lying within an oblong, 24 miles from north to south, by 4½ miles from east to west, encompassing 9½ square miles; northwards there is open ground beyond the then New-road from Paddington to Pentonville, Hemlock (or Wenlock) Barn, Peerless Pool, and Hoxton, St. Agnes-le-Clair, and Shoreditch; on the south, Lambeth, Southwark, Bermondsey, Walworth, Rotherhithe, and Deptford are



REERDOS FOR  
ST MARY'S CHURCH  
RAWMARSH



PAINTED BY W.A. CHASE  
OAK FRAME  
GOLD BACKGROUND.

W. CHASE & CO. DES.



CROSS AND CANDLESTICKS  
IN OAK AND GOLD LEAF

AN ALTAR CROSS ALMS DISH



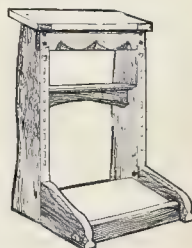
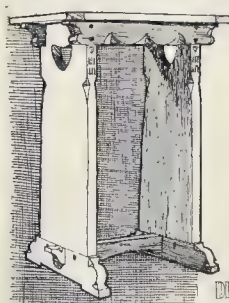
SHELVES FOR BENT'S  
TEMPLE STAIRCASE



CHAIRMAN'S  
CHAIR BY  
CHESBROUGH



CREDENCE TABLE AND LITANY DESK



DESIGNED BY CHESBROUGH

Work done by the Lambeth Guild of Handicraft.



but thinly built over; the town ends on the east side with Wapping, Shadwell, Mile End Old Town, and Spitalfields; on the west, in the extreme south-west corner, is delineated Grosvenor (or Peterborough) House, pulled down in 1809, whilst there is but little beyond Westminster, (old) Picnic, Hyde Park, the modern Tyburnia, and Lord Portman's estate in Marylebone. In the body of the map are depicted Bedford House, the home, in her girlhood and widowhood of Rachel, Viscountess Russell, built in 1664-5 for Thomas, Earl of Southampton, by, it is said, Inigo Jones's pupil, Webb, and pulled down in 1800; Bath House, on the north side of Holborn, the home of Fulke Greville, Lord Brooke, "friend to Sir Philip Sydney"—its site now that of Mr. Alfred Waterhouse's Prudential Assurance Offices; Tindal's (since Bunhill Fields) burial ground; the house designed by Robert Hooke for Ralph, first Lord Montague, afterwards the British Museum, of which the last vestiges remained until 1847, and Haberdashers', or Aske's, Hospital, Hoxton, also by Hooke, whereof a model is preserved in Haberdashers' Hall, Gresham-street; Hooke's Bethlehem Hospital, in Moorfields; the Ranger's House, Green Park (by Robert Adam), pulled down in 1820; the Queen's Palace, built for the Duke of Buckinghamshire and Normanby by Wynde, or Wynne, Inigo Jones's pupil and executor, on the site of Arlington House, and bought in 1761 for Queen Charlotte for 21,000*l.*, from Sir Charles Sheffield (the Duke's natural son), since re-built by Nash, and enlarged by Blom; (old) Foley House, just north of the present Langham Hotel; the Borough and Tothill-fields Bridewells; and many of the almshouses and schools which abounded in what were then the outskirts of the town.

The Introduction to the Directory contains a short account by way of historical retrospect for the interval covered by the two maps. It bears the appearance of having been begun upon a plan more extensive than its performance, and does not mention several districts that have chiefly suffered change in the interval it reviews. A notice of, for instance, the then existing coffee-houses, theatres, markets, prisons, schools, and almshouses would have been interesting. Still, so far as it goes, it seems to be a carefully written chronicle, and, from our standpoint, may at least be commended for its plentiful citation of architect's and sculptor's names—a feature too commonly neglected in essays after its kind. The statistics of area and population, transit and conveyance, are worth perusal at this juncture, when the overcrowded state of the streets and the housing of the poorer classes are instant questions of the day. The tale of losses is a heavy one: Soane's Law Courts; Chambers's Carrington House; Northumberland House (the front attributed to Christmas and Jansen); Burlington House and its colonnade, the latter cast into Battersea Park; Ashburnham House, Dover-street; Inigo Jones's Shaftesbury, or Thanet, House, Aldersgate-street; Robert Adam's "British" Coffee-house, Cockspur-street; the Rolls Chapel; Cockerell's Hanover Church in Regent-street; St. Antholin's, Budge-row, All Hallows, Bread-street, and others of Wren's churches, to cite but a few, are gone; whilst even Mr. Alfred Gilbert's fountain hardly reconciles one to the entire spoiling of Nash's Regent-circus.

#### COMPETITIONS.

**SHREWSBURY TECHNICAL SCHOOL.**—Out of five sets of designs submitted in competition by architects for this school, the Town Council have selected those sent in under the motto of "Daylight," the author of which is Mr. C. R. Dalgleish, architect, Shrewsbury and Wellington.

**INSURANCE BUILDINGS, ABERDEEN.**—After competition, Messrs. Jenkins & Marr, Aberdeen, have been selected as architects for new offices in Union-street, Aberdeen, for the Scottish Temperance Life and Accident Assurance Company. There will be shops, with saloons at the back, on the ground floor; the first and second floors will be used as offices; and the third and fourth floors as dwelling apartments. The estimated total cost is 10,000*l.*

#### BOOKS RECEIVED.

**THE EVOLUTION OF THE ENGLISH HOUSE** (Social England Series). E. S. Oldall Addy, M.A. (Swan, Sonnenschein & Co.).

### Illustrations.

#### DESIGN FOR MURAL DECORATION: "HARVEST."

**T**HIS design, for which the Royal Academy's prize for a design for Mural Decoration was awarded to Mr. George Murray, is intended to be carried out on the blank space of wall (17 ft. by 5 ft. 5 in.) at the head of the stairs to the Refreshment Room at Burlington House. We give also on another plate a reproduction of the life-size cartoon of one of the separate figures, in black and white, which is one of the requirements for competitors for this prize.

The original drawing of the whole design is a water-colour about twice the size of our monochrome reproduction. The original drawing of the cartoon is in charcoal.

#### CARTOON OF A DRAPED FIGURE: "CALLIOPE."

This fine design for a single figure is also by Mr. George Murray, who obtained for it the prize given by the Royal Academy for a "Cartoon of Draped Figure." As we observed, when noticing the Academy students' designs, this figure was quite superior to any of the others submitted, and gained the prize easily. We may congratulate Mr. Murray on his success in gaining two important prizes in the same year. We have no doubt that more will be heard of his work in the future.

#### "THE WHITE HOUSE," MORETON-IN-MARSH, GLOUCESTERSHIRE.

This house, which has been planned for the requirements of a country doctor, is now being built at Moreton-in-Marsh. The walls are of brick, rough cast and coloured, with the lower couple of feet tarred; the dressings to the doors and some of the windows are of local stone, and the roof is covered with the stone slates of the district. An endeavour has been made to keep the whole as simple and quiet as possible.

The stables are also building, and the gardens laid out and yew hedges and trees planted, in character with the rest of the work.

The builders are Messrs. Espley & Co., of Evesham, and the architects Messrs. E. Guy Dawber and Whitwell, London.

#### MONUMENTS IN THE CEMETERY, MILAN.

THESE illustrations are selected from a series of photographs of monuments in the principal cemetery at Milan, as showing a better standard of design and more originality than is generally found in the monuments in English public cemeteries. Two of them bear the names of sculptors, and one, the Bruni monument, that of an architect, Signor Colla; of the two others, one is recorded as designed by the owner that bearing the inscription "A Mia Madre," and of the fifth we have no designer's name.

The Bruni monument—a simple pyramid with an Egyptian doorway rising in relief from its base, the sphinx on one side of the entry and the female figure with an urn on the other—has a really fine character and feeling about it. The seated figure in the central illustration, by Signor Vimercati (presumably a portrait of the lady it commemorates), though not sculptor's work of the first order, is a pleasing and expressive figure.

#### ARCHITECTURAL SOCIETIES.

**EDINBURGH ARCHITECTURAL SOCIETY.**—The annual business meeting was held on Wednesday, the 21st inst. On the following night the supper took place. Mr. A. Lorn Campbell Kiner, President, was in the chair. The following prizes were presented:—Hon. President's prize, for three designs, to Mr. P. E. Nobbs; Measured Work Prize, presented by Mr. J. A. Morris, to Mr. J. H. Rutherford; the President's Prize (façade design) to Mr. Ramsay Traquair; and the Vice-President's Prize (wrought iron gates) to Mr. P. E. Nobbs.

#### TRADE CATALOGUES, &c.

MESSRS. TYLOR & SONS (London and Sydney) send us the seventeenth edition of their illustrated catalogue of sanitary and hydraulic manufactures; a catalogue of nearly 400 pages, very fully illustrated. Messrs. Tylor pin their faith to the valve closet, and their pedestal valve closet certainly seems a very clean and compact one, but we are not shown the mechanism, which must be got into a smaller compass than is generally the case with a valve closet. There are a good many other forms of valve closet shown, also the column pedestal closet, one recommendation of which is that the joint between the earthenware and metal is above the trap, so as to minimise the danger of sewer air entering through the joint. A good many of the illustrations of pedestal closets are pictorial rather than practical; these may be attractive to general purchasers, but architects prefer sections. The descriptions are all very flattering; the "Orient" closet is said to have "a large surface of water in the basin;" we presume what is intended is to say that it is large enough, and thus to anticipate an objection, as in reality the catchment surface in the basin is small. The "massive fireclay pedestal closets," extra strong, are worth attention for special occasions. Among the other contents of the catalogue are automatic flushing tanks, waste-preventing cisterns, slop sinks, cast-iron pipes and connections, baths, pump apparatus, &c.—Messrs. Sagar & Co. (Hallifax) send a very handsomely got-up catalogue of woodworking machinery with highly-finished illustrations which are made more valuable by the systematic arrangement of the text, under three headings, "Class of work designed for," "Construction," and "Capacity," so that the judgment of the purchaser as to what would best suit his purpose is assisted.—Messrs. Graham, Morton & Co. (Leeds) send a catalogue of labour-saving appliances and power transmission machinery. There are particulars given for ordering elevators and belt-conveyors. The catalogue includes illustrations of various forms of elevators for goods or materials, detachable link belting, wrought iron and steel pulleys, &c.—The Falkirk Iron Co. (London, Falkirk, Liverpool, Glasgow, and Edinburgh) send an artistically got-up book of illustrations of cast-iron fire-places, good both in design and drawing, and quite above the usual style of this class of work.

Mr. Gawthorpe (London) sends a catalogue of wrought-iron work, we fear rather old-fashioned from the point of view of the present day, and one of memorial brasses carried out by him in the Gothic revival style, and very good of their class.—Messrs. James Guthrie & Co. (London) send a number of illustrations of ornamental wrought-iron electric brackets and pendants.—Messrs. Boyd send us the "Utilitarian Section" of their catalogue of grates, prefaced with "Hints on Warming," with most of which we agree, but not that "air warmed over hot iron is as healthy as air warmed over brick surfaces." They show a section of their ventilating grate with air coming in warmed from behind the grate; also of the fresh-air ventilating cabinet fire-place. All the grates shown are contrived with the object of assisting ventilation concomitantly with warming; they look promising on paper; of course in summer, when ventilation is most wanted, they will not act, but that is the case with a good many forms of non-mechanical ventilator. Most of these grates, being made in a plain and useful manner, and not professing to be ornamental, are much more successful in appearance than those shown in the "Decorative Section." We do not understand why, after saying on page 10 that "a warming stove lined with fire-brick is a great mistake," they illustrate and describe one (the slow-combustion pedestal stove) on page 35.—Messrs. Sheath Bros. send us their catalogue of indiarubber mats for various purposes.—Messrs. Batcock & Co. send an illustrated catalogue of artists' tools and brushes, also materials for ordinary house-painters' work.—The Waltham Engineering Company send us a sheet of ornamental designs for electric-light fittings and cut-outs.

**BUILDERS' CLERKS' BENEVOLENT INSTITUTION.**—A general meeting of the subscribers of this Institution was held on the 20th inst., Mr. Edwin Brooks, the Treasurer of the Institution, presiding, when Mrs. Emma Wheatley, widow of H. J. Wheatley, late Secretary of the Institution, was unanimously elected to a widow's pension of 24*l.* per annum.



THE BUILDER DECEMBER 31 1898.



DESIGN FOR MURAL DECORATION "HARVEST"—By MR GEORGE MURRAY





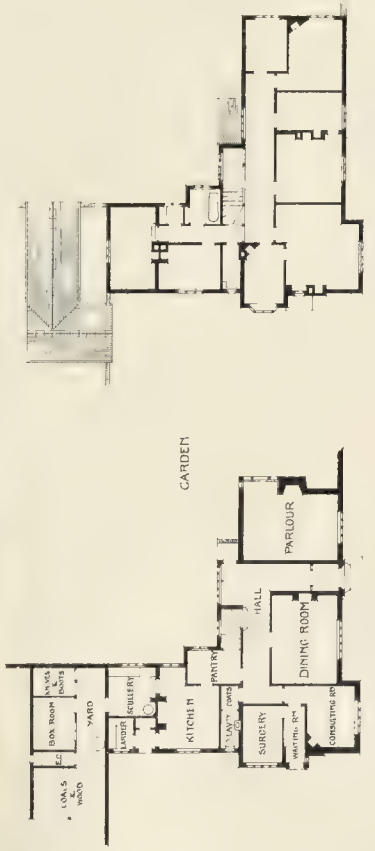
THE BUILDING OF DECEMBER 31, 1899

THE WHITE HOUSE.

FOR ITS STYLE.  
 MORETON IN MARSH. GLOS.  
 E. CH. DAWSON AND WHITWELL.  
 Architects



The Garden Front  
 THE WHITE HOUSE,  
 MORETON IN MARSH.  
 E. CH. DAWSON AND WHITWELL. ARCHTCS.



GROUND PLAN FIRST FLOOR PLAN





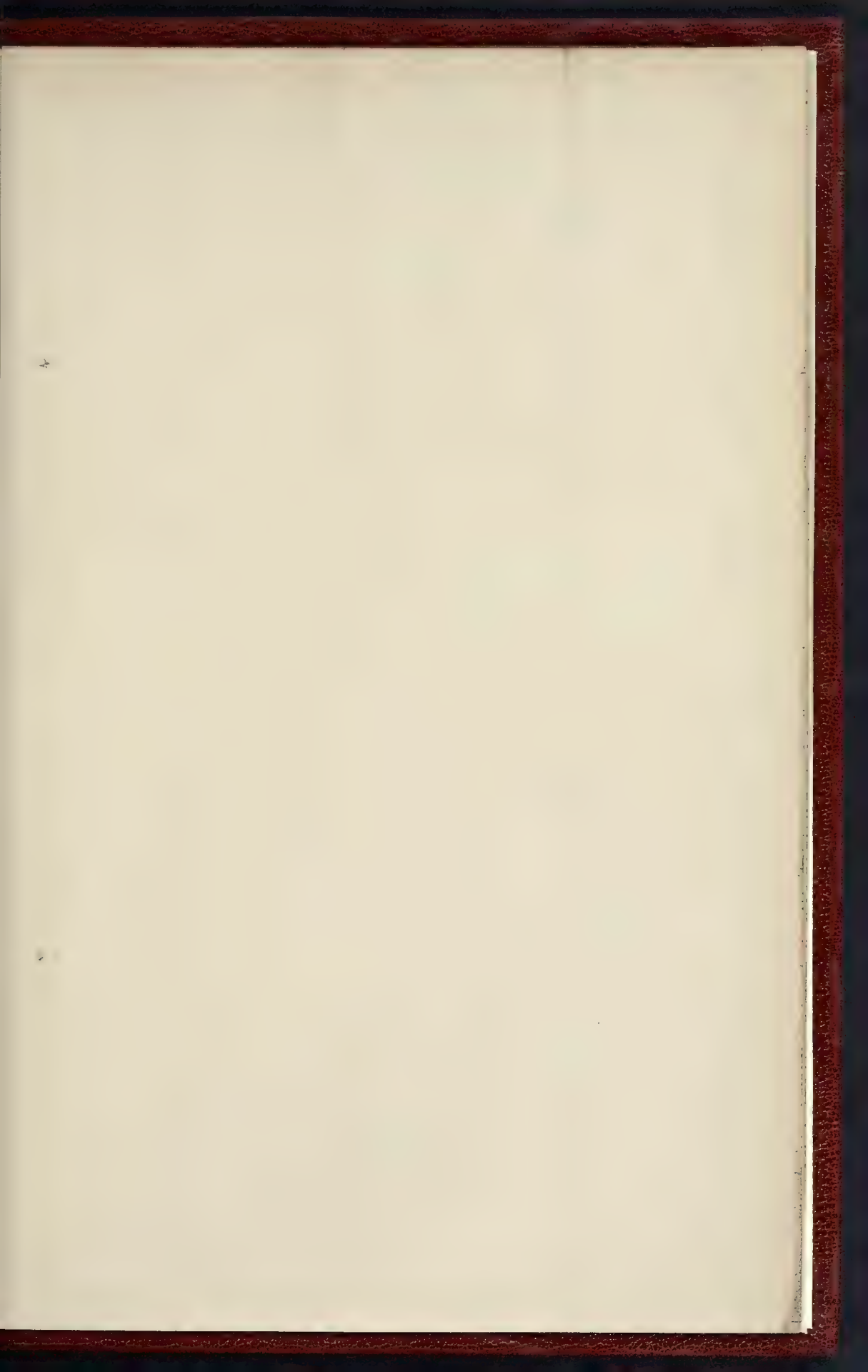


10160. MILANO - Cimitero Monumentale - Monumento Villa Ulrich; scultore L. Vimercati. (Ediz. di Brugi)









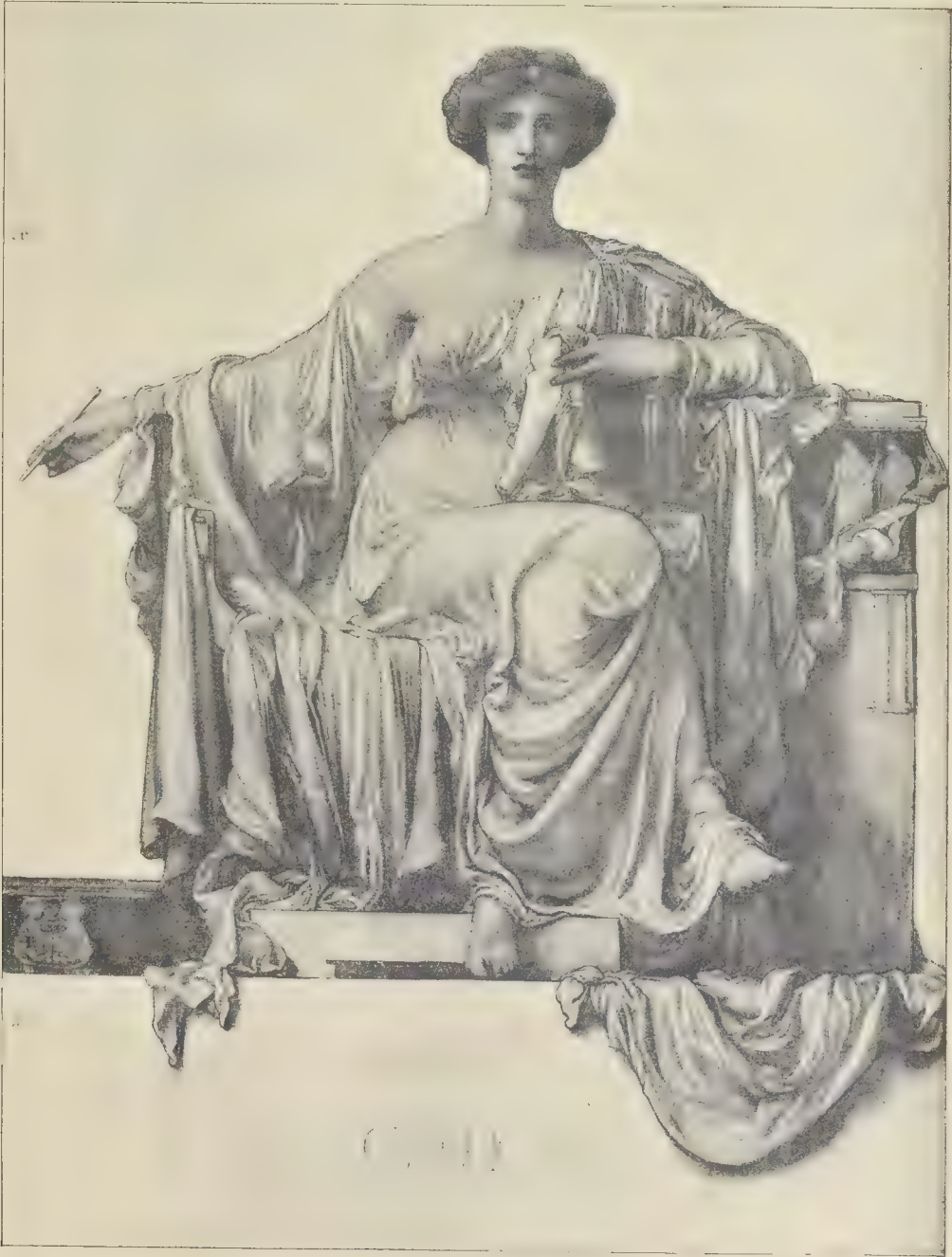


INK PHOTO, SPRAGUE & CO., LTD., 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

CARTOON OF ONE OF THE FIGURES FROM "HARVEST."—By MR. GEORGE MURRAY

Royal Academy Prize Design : 1898





MR. F. W. L. SPRAY, F.R.S. A. & C. EAST, WEST, NO. 10, ST. JAMES'S STREET, LONDON, E.C.

CARTOON OF A DRAPED FIGURE. -By MR GEORGE MURRAY

Royal Academy Prize Design, 1898





## Correspondence.

To the Editor of THE BUILDER.

## COLSTON HALL COMPETITION.

SIR.—With reference to the statement in your last issue "the authors of the third premiated design having actually put the organ player inside the lower portion of the organ case, with three round holes for him to hear what was going on, but where it would be impossible for him even to see the conductor," I should like to point out, as I am mainly responsible for the design of the organ, that the organist is really in a raised organ loft with an open front, and would have a direct view on his mirror of the orchestra and the band.

Regarding your suggestion of the electric organ, I do not think any one in Bristol would dare to propose using one at the Colston Hall, after the disastrous failure and subsequent disuse of the All Saints City organ. Tubular pneumatics will, however, act reliably at a distance of, say, 50 ft., and the console might be dissociated from the organ and placed near the conductor. This is, however, open to the objection that it takes up a good deal of space, and most organists would prefer to have an organ loft to themselves, where they can lay their music about without regarding appearances. It is always desirable to screen the organist from view at a recital, and some organists dislike being seen when playing.

The late organ had forty-two stops, including one 32 ft. open diapason; an organ builder to whom I applied gave its weight at twenty to twenty-five tons, and its area was some three hundred feet. As it is palpably unable to support such a massive instrument without collapsing, which would pass through the orchestra, I proposed utilising the space between them for the staircase and air trunk, and to place the organ loft above, immediately under the sound board of the great organ. We were endeavouring to provide accommodation for this same chorus and band, as the Leeds Festival Committee require, viz., 325 chorus, and 112 band. By the arrangement I have indicated above we were enabled to provide for 325 chorus, and 100 band, spaced as at Leeds.

I have many times sat by an organ keyboard placed in the position shown on the drawings, and have had no difficulty in hearing, and this plan is adopted in many ecclesiastical and concert organs. Two gentlemen, who have acted as organists for many years, kindly looked over the plans of the organ and orchestra, and raised no objection to the arrangement, seeing that the area available was very limited, and that it saved room.

It was, however, a question all through of what to sacrifice, and as all the competing architects that kept to the conditions must have experienced the same difficulties, it becomes a question of which of the many compromises is the most desirable. On these grounds I venture to think there is something in favour of the "absurd position in which the player is placed."

After seeing the spacing and arrangements for the Leeds Festival chorus, I quite agree with you that it is impossible to attempt to design an ideal orchestra within the restricted compass of the old building.

HAROLD SMITH, Associate R.I.B.A.

\*Mr. Smith's letter shows that he did not design without thought and inquiry; but if organ-builders and organ-players told him that was a satisfactory position for the player, right underneath the organ, they did not understand their own business. Organ-builders, in fact, as a general rule know nothing about the subject from a musical point of view. It stands to reason that when an organ has to combine with a chorus and band, the organ-player should be placed where he can hear the combined effect. Otherwise, the natural result is that he is constantly playing too loud, because he cannot hear what he is doing. The greatest organ-player of modern times, the late W. T. Best, held the strongest opinion on this point, as to the position of the player away from the instrument. We may add that electric action is now being so largely and successfully applied to organs that the single failure referred to, probably from some special cause, is hardly worth consideration.—Ed.

## BRUSSELS INTERNATIONAL CONGRESS OF ARCHITECTS.

SIR.—The Report of the United States delegate to the above Congress, which has been issued in pamphlet form, contains some communications from English architects which require some correction.

Professor Aitchison's recollections of English competitions as recorded in his letter to Mr. Totten, the secretary for the United States on the occasion, are not all quite in accordance with the actual facts.

Paragraph 2. Mr., afterwards Sir, Digby Wyatt did not obtain the India Office in competition; he was employed as architect to the India Office to carry out the internal arrangements of the building; the exterior of the same forming part of Sir Gilbert Scott's work.

Paragraph 3. Mr. Edward Barry's plan for the

New Law Courts was selected as the best, and Mr. G. E. Street's architectural elevation, but it was thought that the two might act together in carrying out the work. This being found impossible, to Mr. E. Barry was given the alteration and additions to the National Gallery, for which at the same period there had been another limited competition, and to Mr. Street, the Law Courts. Mr. Waterhouse is also in error in his letter. The Natural History Museum was not won in competition by Captain Fowke. He was asked by the South Kensington authorities to prepare a design, which was done in collaboration with another architect—the name not being given—but it was arranged that if the building were carried out it should be in partnership with this architect, to whom all the architectural portion was due. ARCHITECT.

## THE DECORATION OF ST. PAUL'S.

SIR.—We cannot feel too grateful to Sir W. B. Richmond for having revived—for the first time, I believe, in any country since the fourteenth century—the true technique of mosaic.

But, at the risk of seeming ungracious, we are inclined to call the selection of St. Paul's for his experimental flight almost a blunder. It was not to be expected that he should obtain complete success at one bound; nor has he done so. It does not need a skilled critic to point out that his designs, pretty as they are when examined through glasses, are far too complex. In the vaulting domes over the choir the different parts run into one another, and the amount of gold background visible is about a tenth of what it should be; there is a consequent lack of that breadth which is essential to a satisfactory mosaic treatment. That it was possible to obtain this breadth is proved by the treatment of the pendentives, which is simple and masterly.

Mosaic is seen at its very worst when confined by projecting mouldings within a flat, rectangular panel; and yet in the latest section of the work, Sir William has even added to the number of Wren's panels, thereby increasing his difficulties.

Encouraged by his success in the technique of mosaic he has tried his hand at stained glass; and here, I think, the kindest thing is to be quite frank. His windows are without exception—and he has essayed three distinct manners—disastrous failures. In the first place he has attempted the impossible, namely, to combine mosaic with stained glass. We do not blame the failure, but the attempt. Secondly, if the mosaics are to be seen at all, we want all the light possible; and yet in the apse clearstory the glass is of the crudest and gloomiest "early" type, so that the Majesty is quite invisible save to the eye of faith. In the remaining clearstory windows of the choir there is almost as much lead as glass, and so with all this darkening of the windows it was quite impossible on a sunny day last week to see the upper mosaics at all, though in the nave even the masonry joints of the clearstory, which are not at all conspicuous, could be easily detected.

Surely there was no occasion to fear that in London the glare from the windows would spread so as to kill the mosaics. At any rate, with clear glass they would have been seen sometimes; now they can never be seen with the naked eye.

The great window in the north transept, I hear, to be taken in hand next. What the effect will be when the windows in the drum of the dome are filled one scarcely cares to speculate.

In addition to the point upon the stone in the recent work, your correspondent, "Architect," might have also been seen with the classing and had portions of the lettering upon the frieze which can surely be only experimental? F. C. EDEN.

SIR.—I sincerely trust that the letter in your last issue upon this subject will be instrumental in arousing all architects to a sense of duty in protesting against the destruction now being carried on by the "decoration."

Surely nothing could be more impressive than the beautiful stonework of this interior as left in its original state by Wren; equally certain is it that nothing could be more thoughtless than the cutting of moulded panels in plain ashlar work which was so placed and massed by its constructor, to say nothing of destroying the charm of the stonework by the application of state-looking designs in red paint to arches and other features.

It is necessary, in order to obtain some idea of the final effects, to go and see what has so far been completed under the dome, and to compare it with the old work; and now is the time, while some of the latter yet uncovered.

I learn that it is the intention of the Committee to continue the work throughout the cathedral.

Your assistance in opening the columns of the Builder for the purpose of this protest will, I am sure, be greatly valued by all who desire to see St. Paul's Cathedral retain that place in English architecture which it has, until recently, held.

WILLIAM A. FORSYTH, A.R.I.B.A.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held at Manchester on December 16 and 17, six candidates presented themselves. The following candidate was granted a certificate in Practical Sanitary Science.—W. J. Ball, Warrington.

## The Student's Column.

SOUND, LIGHT, AND HEAT.—XXVII.  
HEAT: CONDUCTIVITY OF SOLIDS.

IF we place a poker in the fire, wait until one end of it is red hot, and then grasp the other end, which was originally cold, we shall find that end also has become hot. The heat has, through the medium of the steel rod, been "conducted" from the fire to the other end of the rod. All solid substances do not conduct heat with the same facility, whilst many others do so in a greater degree.

Metals are usually good conductors of heat, non-metals are bad ones, whilst liquids and gases are worse still. Amongst the metals, Wiedemann and Franz, taking silver as a standard (1,000), arrived at the following results:—

Silver .....	1,000	Iron .....	110
Copper .....	736	Steel .....	116
Gold .....	532	Lead .....	85
Brass .....	231	Platinum .....	84
Zinc .....	190	Bismuth .....	18
Tin .....	145		

It is remarkable that Despretz, by making cavities in the bars experimented upon, and taking gold as the standard (1,000), showed that platinum had a higher rate of conductivity than silver, and only just fell short of gold. He also showed that both marble and brick earth had a slight advantage over bismuth. Although few subjects connected with the science of heat can have much greater importance than the relative conductivity of metals, it is marvellous to find that so little is known concerning it. It is refreshing, however, to note that all are agreed that the conducting power of pure metals for heat and electricity is the same.

Turning to the conductivity in organic substances, it is not surprising to learn that with reference to wood this material conducts better along the fibres than against them. Just as in relation to the transmission of sound, we discover that when the fibre is knotty and distorted by irregularities of growth, heat is the worse conducted, and this difference is more marked with soft than with hard woods. The conducting power of the bark of a tree is always less than that of the internal wood of the same tree.

## Conductivity of Liquids.

Liquids do not readily transmit, or conduct heat. Ganot states that the most complete researches on the conductivity of liquids are those made by Weber. In his method a copper disc about 8 centimetres in radius was separated from another similar one by three pieces of glass, about 0.2 centimetres in thickness. The space thus formed between the two was filled with the liquid to be examined, and the whole was placed horizontally on a smooth block of ice. The lower plate rapidly assumed the temperature of the ice, and the heat travelled through the liquid from the upper plate, the changes in temperature of which were noted by a thermo-electrical arrangement.

As the flow of heat is different in different substances, it will be proportional to a constant. Weber observed the following values for such a constant:—

Water .....	0.00124
Solution of common salt .....	0.00115
Glycerine .....	0.00067
Alcohol .....	0.00049
Olive oil .....	0.00039
Benzole .....	0.00032

The same observer noted that, for the liquids he examined, the conductivity divided by the specific heat of unit volume is an almost constant number.

## Conductivity of Gases.

The power of gases to conduct heat depends very largely on whether they are stationary or moving. A current of gas can transmit heat along its line of route; but if the gas is stationary, it can do next to nothing in that way. The propagation of heat in a gaseous mass is effected by means of the ascending and descending currents formed in it. Air is not a gas, but a mixture; but it obeys the general law that when the lower "strata" in it are heated, they rise and cause currents. Practically the whole of our knowledge of the science of ventilation rests on this, though currents may be artificially promoted by means of fans which act in a measure as pumps. In any case, heated air is bound to rise towards the ceiling. A gas jet, or similar con-

"Ganot's Physics," 1893, p. 387.



trivance, arranged in a flue will also act as an air conductor.

Summarising the practical applications of the conductivity of solids, liquids, and gases, Atkinson states that double walls constructed of thick planks, having between them any finely-divided materials such as shavings, sawdust, &c., retain heat extremely well, and are likewise advantageous in hot countries, for they prevent its access. Double windows are frequently used in cold climates to keep a room warm—they do this by the non-conducting layer of air interposed between them. During the night such windows should be opened, whilst during the daytime they ought to be kept closed. Water boils more rapidly in a metallic vessel than in one of porcelain of the same thickness; whilst the sensation of heat or cold which we feel when in contact with certain bodies is materially influenced by their conductivity.

#### Radiation of Heat.

Heat can be transmitted from one body to another without its raising the temperature of the intervening medium. The following laws of radiation have been laid down:

1. Radiation takes place in all directions round a body.
2. In a homogeneous medium radiation takes place in a right line.
3. Radiant heat is propagated *in vacuo* as well as in air.
4. The intensity of radiant heat is proportional to the temperature of the source.
5. The intensity is inversely as the square of the distance.
6. The intensity is less the greater the obliquity of the rays with respect to the radiating surface.

#### Reflection of Heat.

When heat rays fall upon a body they are commonly split up into two portions, one is absorbed by the body itself, and the other portion glances off, so to speak. The latter is said to be reflected. Just how much will be reflected depends on the absorbent capacity of the body the thermal rays fall upon, and the character of the surface of that body. The reflection of heat, as laid down by Ganot, is governed by the following laws:—

1. The angle of reflection is equal to the angle of incidence.
2. Both the incident and the reflected ray are in the same plane with the perpendicular to the reflecting surface.

It will thus be noted that the laws relating to the reflection of heat are similar to those of light. Much of what has been said respecting the concentration of sound and light towards a single point applies also to the direction of heat, especially in regard to reflection from concave mirrors, and this matter need not, therefore, be further dilated upon.

Taking polished brass as 100, Leslie has found that the reflecting powers of various substances are as follows:—

Silver .....	90	Indian ink.....	13
Steel .....	70	Glass .....	10
Lead .....	60	Lampblack .....	0

The heat absorbing power of a body is always inversely as its reflecting power; a body which is a good absorber is a bad reflector.

#### Diffusion of Heat.

A ray of light falling upon an unpolished surface in a definite direction is decomposed into a variety of rays which are reflected from the surface in all directions. This irregular reflection is called "diffusion." All solar rays are not equally diffused from the surface of bodies, hence the appearance or phenomenon of colours. In Melloni's experiments as described by Ganot a number of strips of brass foil were placed between the source of heat and the thermo-pile. They were coated with the side opposite to the pile with lampblack, and on the other side with the substances to be investigated. Taking the quantity of heat absorbed by the lampblack as 100, the absorption of other bodies was found to be as follows:—

	Incan- dence Platinum.	Copper at 1° deg.	Copper at 10° deg.
Lampblack .....	100	100	100
White Lead .....	50	80	100
Indian Ink .....	15	87	85
Polished Metal .....	15	13	13

Thus white lead absorbs far less of the heat radiated from incandescent platinum than lampblack, but it absorbs the obscure rays from copper at 100 deg. as completely as does lampblack; Indian ink is the reverse of this.

Amongst the practical applications of those branches of physics relating to absorption and reflection of heat the following may be noticed. In a general way, white bodies are good reflectors and bad absorbers; the reverse is the case with black objects. If a liquid is to be kept hot it should be placed in a brightly-polished metallic vessel: this is a reason why the steam pipes of locomotives are kept bright. Atkinson says that in our dwellings the outside of stoves and of hot-water apparatus ought to be black, and the insides of fireplaces ought to be lined with firebrick, in order to increase the radiating power towards the apartment. Many other useful results are arrived at by a close study of the diffusion of heat.

#### Conclusion.

In concluding this series of articles on elementary physics of sound, light, and heat, we must remind the student that although many practical applications of the science are manifested in nearly all building operations, they are not as well understood as they might be. The architect thoroughly understanding phenomena connected with the propagation of sound would undoubtedly and designedly construct the linings of walls in a different manner to one who does not, and thus bring out the best acoustic properties the material could afford. If he pursued the latter part of our subject, and obtained a knowledge of the absorption and reflection of heat, he would be enabled to give us warmer interiors to our dwellings than the architect who did not possess such knowledge—and that not so much by direct artificial heating as by the choice of suitable, warm, and comfortable materials. The subject of artificial lighting by prisms and similar optical devices may also be pursued with profit and advantage. Indeed, it is almost impossible to turn to any branch of physics in which there is not something of practical interest to the student of architecture.

#### GENERAL BUILDING NEWS.

**PARISH CHURCH, MORVEN, N.B.**—This church was opened recently. The new building has been erected from the designs of Mr. P. Macgregor Chalmers, of Glasgow. The church has been erected on the site of the old one, close to the ruins of the medieval church. In taking down the old building a large fragment of a cross shaft was discovered, as well as other parts of moulded and enriched stones, which belonged to the ancient foundation. The design comprises a chancel for the oak communion table and choir seats, and a nave seated to hold about 200 persons. The vestry opens off the side of the chancel. The roofs throughout are all of open timber. The contractor was Mr. Donald Fletcher, Tobermory.

**RESTORATION OF MALMESBURY ABBEY.**—At a recent meeting at the Town Hall, Malmesbury, with the Duke of Beaufort in the chair, Mr. W. H. St. John Hope, Secretary to the Society of Antiquaries, reported on the present condition of the building, and on the work necessary for its preservation and restoration. In accordance with this report, the Rev. G. Windsor Tucker, Vicar of Malmesbury, moved a resolution that the work be undertaken, and, further, that it be divided into three sections:—(1) to put the part of the present building used as a church into a thorough state of repair, the cost being roughly estimated at from 5,000*l.* to 6,000*l.*; (2) to prevent the ruined parts from falling into further decay, the approximate cost being 5,000*l.*; (3) if funds permit, to rebuild the three ruined bays of the nave at a further probable cost of 10,000*l.* This resolution was seconded by Sir John Dickson-Poynder, M.P. for the division, and carried unanimously. A committee was then formed to carry out the work.

**CONGREGATIONAL CHURCH, SOUTHAMPTON.**—A new Congregational Church has been erected in the Avenue, Southampton. The design for the church was selected in competition. The nave is 33 ft. wide. The warming of the church is by low-pressure hot water pipes and radiators. The lighting is by electric water pipes and radiators. The lighting is by Messrs. Lankester & Son, of Southampton. Seats are at present provided for about 700 persons, of whom forty-four will form the choir. There is a western gallery. The organ now in use is only temporary; an organ place for a permanent instrument adjoins the north side of the chancel. There are vestries for the minister, the deacons, and the choir, also a church parlour for small social meetings, two cloak-rooms, and other appurtenances. Externally the building shapes itself as a church with nave and aisles, with north and south porches of two stories, and with a tower rising from the

nave roof at some distance behind the west gable. The walls are of local red brick, with dressings of orange-coloured rubbed brick, and with tracery and mouldings of Monk's Park and Ancaster stone. The roofs in general are tiled, but the aisles are covered with lead flats, having embattled parapets. The outer doors are of oak. Internally the walls are plastered, but the jambs and arches are formed of Staffordshire pressed bricks, with a smooth, hard surface. The nave-piers are of Ancaster stone; the outer masonry, including the pulpit, is of Corsham stone. The chancel is paved with marble. The general contractor for the works is Mr. J. Smith, of Southampton. Messrs. Brinton & Bone have executed the masonry (including the stone pulpit). Mr. H. Wills has acted as clerk of the works, and the architects are Messrs. Cubitt & Collinson, of London.

**CHURCH SCHOOL, WORCESTER.**—The foundation stone has just been laid of a new church school at Rainbow Hill. The school is for boys, and it is being built, from the plans of Messrs. H. Rowe & Son, by Messrs. Joseph Wood & Son. The new buildings are of red brick with stone dressings, harmonising with the existing buildings. The schools will consist of a school-room, to accommodate ninety-six boys, and two class-rooms, each to accommodate thirty-two, the class-rooms being accessible either from the school-room or the exterior. There are also provided hat and cloak-rooms, lavatory, and general store-room. The school will be heated by hot water from the boiler in the existing schools. The estimated cost of the school is 1,200*l.*

**BUILDINGS IN ABERDEEN.**—The Finance Committee of Aberdeen Town Council have resolved to recommend the approval of the plans by Mr. A. Marshall Mackenzie, A.R.S.A., architect, Aberdeen, for the restoration of old Greyfriars Church in front of University Buildings in Broad-street.—A large hotel in grey granite is to be built in Gull-street, on a site measuring 60 ft. by 122 ft., from designs by Mr. R. G. Wilson, architect, Aberdeen.—An extensive bakery is also to be erected in George-street, on the site of the former House of Refuge, from plans by Messrs. Brown & Watt, architects, Aberdeen.—Aberdeen Fish Market is to be extended by the Corporation along South Market-street, according to plans by Mr. R. G. Wilson.

**NEW INFIRMARY AND STEAM LAUNDRY, WAKEFIELD TO UNION.**—A new Infirmary and Steam Laundry have been erected at the Wakefield Workhouse. The new buildings will accommodate 150 patients, a resident medical officer, lady superintendent, nursing staff, and servants. They are situated at the rear of the old workhouse buildings, in Park-lane, face due south, and have an uninterrupted prospect for many miles. They comprise in the centre, administrative block, having on the ground floor a central entrance vestibule and corridor, to the left of which are the lady superintendent's sitting-room, office, store-room, surgery, and nurses' dining-room; on the right are surgeon's sitting-room, bedroom, bath-room, lavatory, &c., and two waiting rooms. Immediately behind and across the main east and west corridor are kitchen, scullery, servants' room, pantry, and stores. To the left of the central or administrative block, 12 ft. distant, connected by covered corridor, is the western or men's pavilion, having three wards, respectively for ten, twenty, and four beds, two day-rooms, separation ward, and a number of special visiting buildings with cut-off corridors. There are two stone staircases to the first floor, as well as lifts for the patients. The women's or eastern pavilion is on the right, and has the same accommodation. The first floor of the central or administrative block, reached by the main central staircase, contains maternity ward, two separation wards adjoining, nurses' sitting-room, ward-kitchen, stores, bath-room, lavatory, &c., while at the rear, across the main corridor, are situated the lady superintendent's bedroom, bath-room, &c. This central block has another story, reached by a continuation of the central staircase, where there are thirteen bedrooms for nurses and servants, and the usual bath-room and other requisite accommodation. The first floor of each pavilion, on the west for males and on the east for females, has the same accommodation in each case as on the ground floor, with the addition of outside balconies. There are also airing courts. All outside walls are faced with Cookson's red pressed bricks, the stone for the dressings being from the Huddersfield neighbourhood. The roofs are covered with blue Bangor slates, the floors are of fireproof construction, and are finished with oak blocks in all wards and rooms, while the corridors, kitchens, stores, &c., are smooth granite-faced cement concrete. The projecting bath-rooms, &c., as well as the administrative kitchens and some other places, are inside faced with ivory white glazed bricks. The only rooms having fireplaces are the sitting-rooms of the resident surgeon, lady superintendent, and nurses, and a few of their sleeping-rooms; the remainder of the building is warmed and ventilated by Mr. W. Key's (Glasgow) system by propulsion. The building is fitted throughout with the electric light, also with telephones and bells. There is also erected in the south-east corner of the site a mortuary and post-mortem room. The laundry buildings comprise a block situate near the eastern boundary of the site. It is over 200 ft. long by 45 ft. wide. The chimney stack is at the



south-east corner, and is 50 yds. high. The buildings are of the same design and built with similar materials as the infirmary block. The roofs inside are open, the principals showing, under the slopes being all close boarded. The laundry machinery and fittings have been supplied and fitted by Messrs. Thomas Bradford & Co., Salford, Manchester. Local contractors generally have been employed.—Messrs. Bagall Bros., excavating, brick, and stone work for infirmary and laundry buildings; Mr. Wm. Atkinson, slater, Leeds, for all slating; Mr. Charles Driver, plasterer, Messrs. Bramall & Broadhead, joiners for infirmary; Mr. Charles Squires, joiner for laundry; Messrs. Henry Brailiwaite & Co., Leeds, plumbing for infirmary, Mr. Samuel Atkinson for laundry, and for new water mains and fire-extinguishing apparatus; Messrs. Alfred Oakes & Son ironwork for infirmary and laundry, also for all boundary railings and gates, and hot-water installation; Mr. Roger L. Lowe, Farnworth, fire-proof construction and oak-block flooring; Mr. Charles Bell, engineer, Bradford, for lifts; Messrs. Bradford & Co., Salford, Manchester, for cooking apparatus and kitchen fittings; Messrs. Charles Turner & Sons, Salford, Manchester, for boundary railings, and Messrs. Goodall & Goodall for laundry; and Mr. George Blakey, fittings for infirmary. Mr. William Watson, architect, Wakefield, has designed the whole of the buildings, and has been assisted during their erection and completion by Mr. John Kelly, clerk of works.

**HOSPITAL ACCOMMODATION IN THE POTTERIES.**—The additions which have been made to the Infectious Diseases Hospital of the Hanley, Stoney, and Fenton Joint Hospital Board, at Bucknall, were opened on the 21st inst. The new buildings consist of two pavilions, each having accommodation for twelve beds, one isolation block for four beds, making a total addition of twenty-eight beds; additions to the administrative block, and a discharging block. All the new buildings, except the additions to the administrative block, are of one story. The administrative block addition has been planned to accommodate the extra staff required through the extension of the hospital. It contains on the ground floor a nurses' dining room, three bedrooms, and pantry, with central corridor; and on the first floor three bedrooms, bath, &c. The cost of the additions is approximately 7,000l. The works have been carried out by Mr. J. Bagall, builder, Fenton, from the plans and under the direction of Mr. Elijah Jones, of Hanley, the Board's architect.

**RE-DEDICATION OF HEATHFIELD BELLS, NEAR TAUNTON.**—On the 23rd inst. the Bishop of the diocese (Dr. Kennion) re-dedicated the bells of the Parish Church, which have recently been re-cast and re-fitted after a silence of nearly a century. The tower, which is about 43 ft. high and 8 ft. square within its walls, which are 3 ft. in thickness at the base, has recently been restored. The whole of the rough cast has been removed from the external faces of the walls and the stonework pointed and strengthened where it had been injudiciously cut away in the belfry stage and elsewhere, but no attempt has been made to repair the string courses and some other parts of the mutilated stonework. The roof is entirely new, the formed of oak beams and rafters covered with cast lead. The heads of the windows of the belfry stage have been repaired where the stonework was much decayed, and filled with slate louveres. The floor of the loft under the belfry has been removed and oak supported on beams of the same material, placed at a slightly higher level than the floor it displaced, so as to clear the arch of the western window and the arch in the east wall which opens up the lower part of the tower to the nave. In this floor a sufficient opening has been provided for passing the tenor bell from the belfry to the ground. Measures have been taken for keeping the foundations dry by laying a surface gutter close to the walls and carrying the rain water to some little distance from the fabric. The four old bells, three of which were either broken or badly cracked, have been recast by Messrs. Mears & Stainbank, of Whitechapel, London, E., and hung in a new cage by Mr. J. Sully, of Zinch, Stogumber. The work, with the exception of the bells, has been carried out by Mr. H. W. Pollard, contractor, of Bridgwater, from the plans and under the personal direction of Mr. J. Houghton Spencer, architect, of Taunton.

**BUILDING OPERATIONS IN BLACKPOOL.**—The Borough Surveyor of Blackpool, in his annual report to the Building Plans Committee, states that during the year ending October last, no fewer than 1,066 houses were completed and certified for human habitation, being eighty-two more than in the previous year. There were, however, considerably fewer plans approved during 1898 than 1897, the decrease amounting to 855 buildings. The falling off in the number of houses for which plans were approved was no less than 730 in 1898 as compared with 1897, while there were seventy-two shops less approved, and thirty-five additions and alterations.

**THE SUNDERLAND BUILDING TRADE.**—The Building Committee of the Sunderland Corporation have just had plans before them which show that the local builders have in contemplation the erection of 433 houses, chiefly of one story and one story and a half, though some of the dwellings are to be larger. Of the sixty-seven plans submitted, fifty-four have been passed, five adjourned, and eight disapproved. Messrs. W. & T. R. Milburn pre-

sented a plan for a Jewish Synagogue in Villiers-street South, which showed a building 25 ft. in height to the eaves, and capable of accommodating 140 persons on the ground floor and sixty on the gallery floor. The plan has been approved by the Watch Committee. The same architects also brought forward a plan for the rebuilding of the Sunderland Football Club for a new clubhouse to be erected at the south-east corner of the football field, adjoining Roker Baths-road. The plan was approved.—*Newcastle Journal.*

**CO-OPERATIVE PREMISES, WORCESTER.**—For some months past alterations and additions to the Worcester New Co-operative Society premises in St. Nicholas and Trinity streets have been in progress, and the premises have now been opened. The additions comprise on the ground floor a shop 27 ft. by 17 ft. 6 in., and an enlargement of the first floor there is a show-room, 50 ft. by 17 ft. 6 in., a shoemaker's shop, office, store-room, and a conference-room, 23 ft. 6 in. by 11 ft. On the second floor there is an addition to the general meeting and recreation room of 60 ft. by 44 ft., and to the kitchen of 23 ft. 6 in. and 11 ft. On the third floor there are new store-rooms, and in the basement the premises, both new and old, are lighted by electric light and gas, and heated by hot water. The additions are made with brick and Bath stone, and designed to harmonize with the character of the other buildings. Messrs. J. Wood & Sons were the contractors for all the building work, the hot-water apparatus was laid on by Messrs. J. Ward & Son, electric light by Messrs. H. E. Keen & Co., gas by Mr. F. Fluck, and lifts by Messrs. Clark, Bunnell & Co. The whole of the works have been carried out from the designs and under the superintendence of Messrs. Yeates & Jones.

**RE-OPENING OF BARNSEY THEATRE ROYAL.**—The Theatre Royal, Barnsey, has been re-built, and was re-opened on the 19th inst. The new building, which has a frontage to Wellington-street, has been built on the site of the old Theatre Royal, from the plans of Mr. Walter Emden, of London, the details being worked out and carried into effect under the superintendence of Mr. Herbert Crawshaw, architect. The external dimensions of the building are:—Length, 106 ft.; breadth, 55 ft. The inside measurements are, pit, 56 ft. by 51 ft.; dress circle, from curtain line to front tier, 33 ft., to back, 55 ft.; gallery, from curtain line, 36 ft., to back, 61 ft. 6 in.; the height of the auditorium to the lantern light is 45 ft. The internal woodwork is of the American walnut, with brass furnishings. The stage is 30 ft. 6 in. deep by 50 ft. 6 in. wide; the proscenium opening 25 ft. wide by 28 ft. in height. The interior is finished in cream and gold, electric blue, and bronze and gold. Altogether there is seating for 1,200. The work has been carried out by the following tradesmen:—Mason and bricklayer, Mr. Walter Dunk; carpenters, joiners, and slaters, Messrs. Robinson & Son; heating, lighting, and sanitary engineering, Messrs. Hutchinson Brothers; plastering, Mr. T. Lindley; iron and steel work, Messrs. Wright & Son, Hull; concretor, Mr. J. Cooke, Huddersfield; painters, Messrs. Stephenson & Son, Barnsey; seating and upholstery, Messrs. Wright & Son, Hull; floor-plaster work, Messrs. S. Johnson & Son, Mirfield; decorators, Messrs. J. Binns & Son, Halifax; carpets, curtains, &c., Whaley Bros., Barnsey.

## SANITARY AND ENGINEERING NEWS.

**WATER SUPPLY, NEWPORT, ISLE OF WIGHT.**—At Newport, Isle of Wight, on the 21st inst., the opening took place of new waterworks, constructed at a cost of about 21,000l. Mr. Baldwin Latham was the engineer of the works.

**GOOLE WATER SUPPLY.**—The Goole Urban District Council are obtaining Parliamentary powers to carry out new waterworks designed by Mr. Matthew Dunn, their gas and water engineer, and have appointed Mr. J. C. Melliss to be their consulting engineer.

**WATERWORKS, SOUTHAMPTON.**—Mr. Edmund Pearce Burd, one of the Local Government Board Inspectors, held a public inquiry at the Audit House, Southampton, recently, relative to an application by the Corporation for a provisional order under the Public Health Act, to borrow additional moneys for the purposes of their waterworks undertaking. Mr. W. Matthews (waterworks engineer) stated that the 124,500l. previously borrowed was practically exhausted. During the next five years the Corporation would require 25,000l. for the purpose of executing additional works, in order to meet the increasing demands for water for domestic and sanitary purposes, and that demand had arisen owing to the continued increase and development of the borough. It was very difficult to cope with the demands at present, but they had been able to afford a constant supply. In answer to the Town Clerk, Mr. Matthews said that the waterworks undertaking was very remunerative, and would be more so in future.

**NORTH PIER, NEWCASTLE-ON-TYNE.**—The contract has now been signed for the rebuilding of the North Pier at the mouth of the Tyne to seaward. The contract price is over 400,000l., and the structure is to be completed within six years. The engineers

for the new pier, the foundations of which will be carried down to the boulder clay, are Sir J. Wolfe Barry, C.E., and Messrs. Goodall, Son, & Matthews. The contractors are Sir John Jackson & Co., Limited, London. The old pier was damaged and breached by the storms of 1895, 1896, and 1897. What remains will serve as a breakwater during the construction of the new portion, which will be quite an independent structure from a point landward of the breach, and will make the pier straight instead of curved.

**SEA-WATER FOR LONDON.**—Under their Act of 1895 (59 and 60 Vict., c. 758) the London Sea Water Company have been incorporated for the purpose of taking an unlimited quantity of sea-water from the English Channel and conveying it through mains to London, connecting the mains with the service of private houses, hotels, hospitals, and other institutions, swimming-baths, &c., the provision of stand-pipes for distribution and sale of sea-water, supply for street watering and cleansing, flushing sewers and drains, with hydrants for the extinction of fires. The authorised intake is on the east side of Lancing, whence the water will be pumped from storage tanks to a reservoir on the adjoining downs, 480 ft. above sea level, and then flow in mains laid along the roads through Horeham, Dorking, and Leatherhead, into a second reservoir at Epsom, and thence through Streatham and Battersea into Central London—a distance of fifty-five miles, and a supply of 10,000,000 gallons per day, under a constant pressure due to a head of about 220 ft. of water above sea level, to be increased when necessary. The Company's engineers are Messrs. Hawkshaw & Hayter, and Mr. J. S. Macintyre, M.M. Inst. C.E.

## STAINED GLASS AND DECORATION.

**WINDOW, NEW GREYRIARS' PARISH CHURCH, EDINBURGH.**—This church, recently decorated and fitted with electric lights, has now had its large west window filled with stained glass, as a memorial of the late Mrs. Pillans. The central design is the Resurrection. On either side of the central light are correspondingly large side lights. The work has been carried out by Messrs. Ballantine & Gardiner.

**MEMORIAL WINDOW, SUNDERLAND.**—In the Church of St. Ignatius the Martyr, Sunderland, a window was dedicated on the 17th inst. It is in the west end, and has three lights, and has been executed by Messrs. Burlison & Grylls. It consists of nine cartoons, illustrating the late Bishop Lightfoot's life, work, and inspiration.

**MEMORIAL WINDOW, LICHFIELD.**—On the 20th inst. the Lord Bishop of Lichfield dedicated a stained-glass window and tablet at St. Mary's Church, Lichfield, as a memorial of the late Archdeacon Scott. The memorial window is in the south side of the nave. The work has been executed by Messrs. Ward & Hughes, of London.

**ALTAR RAILS, CANTERBURY CATHEDRAL.**—In the Sanctuary of Canterbury Cathedral new altar rails of bronze have just been placed. The work was designed by Sir Arthur Blomfield, A.R.A.

## FOREIGN.

**FRANCE.**—At the Académie des Beaux-Arts M. Lefebvre, the painter, has been elected President for 1899, and M. Normand, the architect, Vice-President.—The Conseil-Général of the Seine has commissioned M. Paul Schmidt to decorate with landscape paintings the grand staircase of the Mairie of Montrouge; and M. Camille Lefebvre has been commissioned to execute some bas-reliefs in marble for the Salle des Fêtes of the Mairie of Issy-Moulineux.—The statue of Daudet is to be set up in the Luxembourg Garden, not far from that of Watteau.—The demolition of the old prison of St. Pelagie is to be commenced next month, and that of La Roquette not long after.—The Municipality of Aix has voted two and a half million francs for public works, including the erection of a Natural History Museum.—M. Edouard Bissuel has been elected President of the Société Académique d'Architecture de Lyons for the ensuing year.—The Château of Azy-le-Rideau, which for some years has been transformed into a kind of pension, is to be restored to its former condition and preserved as an example of French Renaissance architecture.—A monument to Victor Hugo is to be erected at Besançon.—M. Bartholdi is to execute a monument to Vinciguerra, to be erected at Clermont-Ferrand.—The works for the construction of the monumental gateway to the 1900 Exhibition, on the Place de la Concorde, have commenced. The work is carried out from the plans and under the direction of M. Binet.—The Municipality of Lyons have decided on an expenditure of two million francs on the complete transformation and improvement of the Saint Paul district, where new streets are to be formed and a Conservatoire of Music erected.—At the town of Sfax (French Algeria) some important improvements are in progress, including a new Hôtel de Ville and a new system of sewers.—The death is announced, at the age of eighty, of M. Charles Read, who may be said to have been the creator of the "Service des Travaux publics" of the Paris Municipality. He was the first to















Fulham.—108, Fulham-rd., u.t. 52 yrs, g.r. 154, r. 1501.

By C. P. WHITELEY.

Ilford.—Trafalgar-villas, f.g.r. 221 108, reversion in 74 yrs.

By CHANCELLOR & SONS.

Chislewick.—Strand-on-the-Green, The Elms and Elston, c. 1, 2, 3.

Strand-on-the-Green, Prospect House and two cottages, c. 1, 2, 3.

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Paddington.—Harrow-rd., "The Windsor Castle" p-h and shop adjoining, a freehold rental of 1054, reversion in 84 yrs.

Lee.—151 to 167 (odd), Lee-rd. (including the "New Tiger's Head" p-h); also 1, 2, and 3, Williams-pl., u.t. 104 yrs, g.r. 581, 108, r. 462.

By MATTHEW MILLS (at Masons' Hall Tavern).

Greenwich.—Old Woolwich-rd., "The Duke of Wellington" p-h, a rebuilding lease for 80 yrs, g.r. 801.

December 14.—By CUMBERLAND & SONS (at Tisbury).

Hilton, Derby.—Freehold house and a p. 319.

Hoon, Derby.—Hoon Hall and 206a, 21, 10 p, f. Two freehold houses, 21, 10 p, f.

Hatton, Derby.—Hatton House Farm, 21, 10 p, f. 25 p, f.

A Stanworth-st., r. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Hammer-smith.—343, King-st., u.t. 20 yrs, g.r. 74, r. 381.

By E. W. RICHARDSON & SONS.

Finchley.—21, 23, and 25, Station-rd., u.t. 71 yrs, g.r. 102, 108, r. 864.

By SALTER, RICE, & CO.

Camden Town.—High-st., f.g.r. 364, reversion in 73 yrs.

By THOMAS STICKNEY & SONS (at Masons' Hall Tavern).

Putney.—2, Emly-rd., u.t. 70 yrs, g.r. 41, r. 281.

By JOHN BAIRD.

Bermansley.—Newman-st., a Glue and Size Manufactory, with good mill, plant, &c., u.t. 54 yrs, g.r. 154.

By NICHINGALE, PHILLIPS, & PAUL.

117, Colleywall-rd., u.t. 49 yrs, g.r. 154, r. 171.

By THOMAS STICKNEY & SONS (at Masons' Hall Tavern).

71 and 73, Long-lane, f. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Hammer-smith.—343, King-st., u.t. 20 yrs, g.r. 74, r. 381.

By E. W. RICHARDSON & SONS.

Finchley.—21, 23, and 25, Station-rd., u.t. 71 yrs, g.r. 102, 108, r. 864.

By SALTER, RICE, & CO.

Camden Town.—High-st., f.g.r. 364, reversion in 73 yrs.

By THOMAS STICKNEY & SONS (at Masons' Hall Tavern).

Putney.—2, Emly-rd., u.t. 70 yrs, g.r. 41, r. 281.

By JOHN BAIRD.

Bermansley.—Newman-st., a Glue and Size Manufactory, with good mill, plant, &c., u.t. 54 yrs, g.r. 154.

By NICHINGALE, PHILLIPS, & PAUL.

117, Colleywall-rd., u.t. 49 yrs, g.r. 154, r. 171.

By THOMAS STICKNEY & SONS (at Masons' Hall Tavern).

**LONDON.**—For rebuilding the north-west side of Webber's row and 72, Webber-street, Southwark, for the trustees of the late John Marshall (Marshall's Charity). Messrs. F. S. Breton & Son, architects, 59, High Holborn. Quantities by Mr. E. G. Hardcastle, 51, Chancery-lane.

W. H. Wagstaff & Son .. £25,197	Batley, Sons, & Holmes .. £27,149
W. Downs .. 24,091	Ashby Bros. .... 22,271
Lalley Bros. .... 24,091	I. Crover & Son .. 22,734
W. H. Lascelles & Co. .. 24,197	J. Carmichael .. 22,247
J. Triggs .. 23,570	

\* Accepted subject to the approval of the Charity Commissioners.

**LONDON.**—Accepted for the erection of billiard-room and approach, "The Hawthorne," Had Moon-lane, S.E. Mr. H. Payne-Wyatt architect.

W. D. Palmer .....	£703
--------------------	------

**LOUGHTON (Essex).**—For the erection of a house in the High-road, Loughton, for Mr. C. R. Matland. Mr. E. Egan, architect.

Turner .....	£1,800	Walter Lawrence .....	£1,045
Warner .....	1,075	F. W. Foster .....	1,440
Foster .....	1,075		

**LOUGHTON (Essex).**—For the erection of seven cottages, for Messrs. Gould Bros. Mr. E. Egan, architect.

Wartiner .....	£1,115	C. S. Foster .....	£1,042
Walter Lawrence .....	1,000	F. W. Foster .....	1,075
Cuthbert .....	1,042	Keen .....	980

**MIDDLESBROUGH.**—For reconstructing a sewer, Marsh-road, for the Corporation. Mr. F. Baker, C.E., Municipal Engineer, Middlesbrough.

*Part of 1900 Price List.*

Ed. le Bas & Co., 18, Buller-street, London, E.C.	9 10 0
---	--------

*For 1900 Price List.*

Ed. le Bas & Co., 18, Buller-street, London, E.C.	9 10 0
---	--------

*For 1900 Price List.*

The Staveley Coal and Iron Company, Limited, near Chesterfield .....	4 10 0
--	--------

*For 1900 Price List.*

The Staveley Coal and Iron Company, Limited, near Chesterfield .....	9 10 0
--	--------

*Part of 1900 Price List.*

Cochrane, Grove, & Co., Middlesbrough .....	4 8 9
---	-------

*Special Castings.*

Cochrane, Grove, & Co., Middlesbrough .....	9 0 0
---	-------

The remainder of the work will be carried out by the Corporation workmen.

\* Accepted.

**MIDDLESBROUGH.**—For the erection of a villa residence, Starrow-road. Mr. J. M. Bottomley, architect, 38, Allerton-road, Middlesbrough.

*Part of 1900 Price List.*

Perks & Son .....	£2,852	Allison Bros., Middlesbrough .....	£2,415
Eastman Bros. .... 2,772			
Newby & Co. .... 2,742			

**PETERBOROUGH.**—For the erection of six houses, Dogsthorpe, for Mr. Frank. Mr. J. G. Stallebrass, architect, North-street, Peterborough. Quantities by architect.

*Part of 1900 Price List.*

F. Colls .....	£893	R. J. Nicholls .....	£815
Watson & Lucas .....	850	Sibley Bros. (accepted) ..	814
G. Brown .....	845	G. Nicholls .....	809

All of Peterborough.

**RUSHDEN.**—For the erection of two houses on the Washbrook-road, for Mrs. J. Bailey. Mr. H. Knight, architect, Rushden.

*Part of 1900 Price List.*

F. Henson .....	£409	T. Willmott .....	£410
C. E. Bayes .....	475	T. & C. Berrell .....	475
Hassley Bros. .... 469		T. Swindall .....	468
F. Martin .....	469	Dickens Bros. .... 468	
Cl Sparrow .....	465		

\* Accepted.

**C.B.N. SNEWIN**

MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and TIMBER MERCHANT,

Nos. 7, 9, 10, 11, 12, 13, 14, 15, 16, and 17, BACK HILL, BATTON GARDEN, and 23, RAY STREET, FARRINGTON ROAD, E.C.

THE LARGEST STOCK OF ALL KINDS OF WOODS IN EVERY THICKNESS, DRY, and FIT FOR IMMEDIATE USE.

Telephone No. 274 Holborn. Tels. Address "SNEWIN" London.

**RUSHDEN.**—For the erection of coach-builder's shop, &c., on the New-road, for Mr. Arthur Bond. Mr. Harry Knight, architect and surveyor.

*Brickwork only.*

Bradshaw & Cooper .. £19 13 3	W. H. Henson .....	£48 0 0	
Dickens Bros. .... 213 17 0	T. Willmott .....	185 10 0	
T. Swindall .....	190 10 0	W. Packwood .....	185 0 0
C. E. Bayes .....	120 0 0	F. Henson .....	185 0 0
T. & C. Berrell .....	185 0 0	R. Marriott .....	153 0 0

\* Accepted.

**SEAFORD (Sussex).**—For alterations and additions to "Crouch House," Seaford, Sussex, for Mr. J. F. Plaines. Mr. William Cooper, architect, 27, Havelock-road, Hastings.

*Part of 1900 Price List.*

C. Moring, Seaford .. £2,741	S. H. Berry .....	£2,120
------------------------------	-------------------	--------

\* Accepted.

**WEMBLEY (Middlesex).**—For additions and alterations to St. John's Church, for the Vicar and Churchwardens. Mr. Hayward Brakspear, architect. Quantities by Mr. F. G. W. Bush.

*Part of 1900 Price List.*

Charles F. Kealey .. £2,091	Courtney & Fairbairn ..	£2,656	
Bulled & Co. .... 2,750	Charles Brightman ..	2,684	
Webster & Cannon .. 2,750	Whithead & Co., Ltd. ..	2,688	
Dyerman .....	2,750	F. J. Shephard, Sutton, Surrey (accepted) ..	2,570
Beer & Gash .....	2,746		

\* Accepted.

**TO CORRESPONDENTS.**

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any communication to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

**TERMS OF SUBSCRIPTION.**

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 10s. 6d. per annum in advance. For the Colonies, India, and elsewhere, at 12s. 6d. per annum. Remittances payable to DOUGLAS FORKORNIEN should be addressed to the publisher of "THE BUILDER," No. 45, Catherine-street, W.C.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (22 numbers) or 4s. 6d. per quarter (5 numbers), can ensure receiving "The Builder," by Friday Morning's Post.

**W. H. Lascelles & Co.,**

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

**HIGH-CLASS JOINERY,**

**LASCELLES' CONCRETE**

Architects' Designs are carried out with the greatest care.

**CONSERVATORIES,**

**GREENHOUSES,**

**WOODEN BUILDINGS,**

**Bank, Office, & Shop Fittings.**

**CHURCH BENCHES & PULPITS.**

ESTIMATES GIVEN ON APPLICATION.

**THE BATH STONE FIRMS, Ltd.**

**BATH**

FOR ALL THE PROVED KINDS OF **BATH STONE.**

FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

**HAM HILL STONE.**

**DOULTING STONE.**

The Ham Hill and Doulting Stone Co. (Incorporating The Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.)

Chief Office:—Norton, Stoke-under-Ham, Somerset.

London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, war-house floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.]

**SPRAGUE & Co., Ltd.,**

Sole Agents for

THE "E.R.A." PHOTO. BLOCK CO.

4 & 5, East Harding-street, Fetter-lane, E.C. [ADVT.]

**QUANTITIES, &c., LITHOGRAPHIC**

accurately and with despatch.

**METCHIM & SON** (77, GLOUCESTER STREET, LONDON, W.C.)

"QUANTITY SURVEYORS' DIARY AND TABLES" For 1899, price 6d. post 7d. In leather 1/- Post 1/1 [ADVT.]

**Ernest Mathews & Co.**

61, St. Mary Axe, E.C.

**SLATES, SLABWORK,**

Enamelled Slate, Marble, Permanent Green Slates.

WORKS:

Bow, London, E. and Aberllefny, North Wales

BRANCH HOUSE:

37, Victoria-street, Bristol.

**PILKINGTON & CO.**

(ESTABLISHED 1838), MONUMENT CHAMBERS,

KING WILLIAM STREET, LONDON, E.C.

Telephone No., 2751 Avenue

Registered Trade Mark,

**Polonceau Asphalte**

PATENT ASPHALTE and FELT ROOFING, ACID-RESISTING ASPHALTE.

WHITE SILICA PAVIN

SEYSSSEL ASPHALTE.

**W. DUFFY'S PATENT**

**IMMOVABLE ACME**

**WOOD BLOCK FLOORING.**

THE PERFECT FLOORING FOR ALL PURPOSES.

Seven Gold Medals, four Silver, two Bronze Medals, and Certificate of Sanitary Institute of Great Britain.

Full Particulars and Prices on application to

**THE ACME WOOD FLOORING COMPANY, LTD.**

Chief Offices and Works: Gainsborough Road, Victoria Park, London, N.E.









GETTY CENTER LIBRARY



3 3125 00702 3852



